M.Tech – Model Questions Civil (Section Code-01)

Find the work done by a constant force $\overline{F} = 2\hat{i} + 4\hat{j}$, if its point of application to a 1. block moves from A(1,1) to B(4,6)c) 26 a) 36 b) 28 d) 32 If $u(x, y) = x^3 - 3xy^2 - 5y$, then its harmonic conjugate function is 2. a) $3x^2y - y^3 + c$ b) $3x^2y - y^3 + 5x + c$ c) $3x^2y - y^2 - 5x + c$ d) $3xv^2 - v^3 + 5x + c$ The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where D \equiv \frac{d}{dx}\right)$ is 3. b) $\frac{1}{30}(2\cos 3x + \sin 3x)$ a) $\frac{1}{30}(\cos 3x - \sin 3x)$ d) $\frac{1}{30}(\cos 3x - \sin 3x)$ c) $\frac{1}{30}(2\cos 3x - \sin 3x)$ The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is 4. a) 2.6875 b) 2.3232 d) 2.1001 c) 2.7998 if $\overline{F} = (3x^2 - 3yz)\hat{\imath} + (3y^2 - 3zx)\hat{\imath} + (3z^2 - 3xy)\hat{k}$, then div \overline{F} is 5. a) 6(x+y+z)b) 6(*x*-*y*-*z*) c) 3(x+y+z)d) 2(x+y+z)If X is a poisson variate such that $P(X=1)=\frac{3}{10}$ and $P(X=2)=\frac{1}{5}$, find λ 6. a) $\frac{3}{4}$ b) $\frac{3}{2}$ c) $\frac{4}{2}$ d) $\frac{1}{4}$ If $A+B=\begin{pmatrix} 1 & -1 \\ 0 & -3 \end{pmatrix}$ and $A-B\begin{pmatrix} 3 & 1 \\ 1 & 4 \end{pmatrix}$, then the product AB is 7. a) $\begin{pmatrix} -1 & -1 \\ 0 & -3 \end{pmatrix}$ b) $\begin{pmatrix} 0 & -1 \\ -1 & -3 \end{pmatrix}$ c) $\begin{pmatrix} 0 & -6 \\ -2 & -2 \end{pmatrix}$ d) $\begin{pmatrix} -2 & -2 \\ 0 & -6 \end{pmatrix}$ The value of $\int_0^{\frac{\pi}{2}} \cos^6 x \, dx$ is 8. a) $\frac{3\pi}{32}$ b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$ d) $\frac{\pi}{32}$ Find the points at which the function $f(z) = \frac{z}{z^2 - 1}$ is not analytic. 9. d) z = -1a) $z = \pm 1$ b) $z = \pm 2$ c) z = 1If $x = a (\cos t + t \sin t)$, $y = a (\sin t - t \cos t)$, find $\frac{dy}{dx}$ 10. b) cosec t a) cot t c) sec t d) tan t

| 11. | The property of a material by which it can be drawn to a smaller section due to tension is called | | | | |
|-----|---|--|---|-----------------------------|--|
| | a) Plasticity | b) ductility | c) elasticity | d) malleability | |
| 12. | For a simply support a) least at the centre c) maximum at supp | ed beam with a centra orts | l load, the bending mo b) least at the suppor d) maximum at the | oment is rts e centre | |
| 13. | Struts are load carry a) axial tension loads c) torsional loads | ing members of a fram | ne structure which are b) axial compressive d) transverse loads | subjected to loads | |
| 14. | The shape of the ben always | ding moment diagram | over the length of a b | eam, carrying udl is | |
| | a) linear | b) parabolic | c) cubical | d) circular | |
| 15. | The value of poissor a) greater than one | ı's ratio always remair b) less than one | is c) equal to one | d) none of these | |
| 16. | The maximum deflec W is | ction of a simply supp | orted beam of length I | with a central load | |
| | a) WL²/48EI | b) W ² L/24EI | c) WL ³ /48EI | d) ^{WL2} /8EI | |
| 17. | If the width of a sir doubled, the deflection | nply supported beam on of the beam at the c | carrying an isolated entre is changed by | load at its centre is | |
| | a) ½ | b) 1/8 | c) 2 | d) 8 | |
| 18. | The window which p a) casement window c) dormer window | projects outside the roc | om of a building is kno b) auxiliary window d) baywindow | wn as | |
| 19. | In terrazzo flooring a) marble chips are used as aggregates in concrete b) marble chips are spread over concrete base c) marble powder is mixed with concrete to give smooth surface | | | | |
| 20. | d) clay tiles on concre In case of public bu essential is | ete base are fixed uildings, the minimur | n width of a stairs, v | which is considered | |
| | a) 100cm | b) 125cm | c)150cm | d)175cm | |
| 21. | Sand belonging to th a) Zone II and III | is zone is normally rec b) Zone I | commended for concre c) Zone IV | tes d) All the above | |
| 22. | The lower edges of th a)bottom ridge | ne sloping surface of a b)valley | roof called c)eaves | d)gables | |
| 23. | A wall constructed to a) buttress wall | o withstand the pressu b) parapet wall | re of earth filling is cal c) retaining wall | led d) pier | |
| 24. | Which will have leas a) cork | t weight per cubic met b) glass | er? c) cement | d) saw dust | |

| 25. | In case of balconies li a) 750 kg/m² | able to overloading, th b) 500 kg/m² | ne live load is taken as c) 400 kg/m² | d) 200 kg/m² |
|-----|--|--|---|--|
| 26. | The inner curve of th a) Intrados | e arch is called as b) Extrados | c) Jambs | d) rise |
| 27. | Which of the followin a) Exhaust fans | ng is used for ventilation b) Light | on c) Air conditioners | d) Bulb |
| 28. | Boussinesq theory is a) Stress in soil is pro b) Stress in soil is ind c) Stress in soil is invo d) Stress in soil is pro | applicable if portional to strain ependent of strain ersely proportional to portional to square of | strain the strain | |
| 29. | Railway Stations at | which a railway line | or one of its branch l | ines terminates are |
| | a) Terminal Stations c) Halt Stations | | b) Junction Stations d) central station | |
| 30. | For one cubic metre o a) 400 | of brick masonry numb b) 425 | per of bricks required is c) 450 | s d) 500 |
| 31. | In the case of balanced section a) Maximum stresses in steel and concrete simultaneously reach allowable value b) steel stress reaches its maximum allowable value c) concrete stress reaches its maximum allowable value d) concrete stress reaches its maximum allowable value first and steel stress reaches its maximum allowable value first and steel stress reaches its maximum allowable value | | | |
| 32. | The wall which is do weight is known as | esigned to carry supe | r-imposed loads in ad | dition to their own |
| | a) load bearing wall c) cavity wall | | b) non load bearing v d) Retaining wall | vall |
| 33. | Footings which sprea known as | id the super imposed l | oad of wall or column | over a larger area is |
| | a)strap footing | b) combined footing | c) spread footing | d) mat footing |
| 34. | When the soil mass is a) submerged density c) saturated density | s saturated, its bulk de | nsity is called b) dry density d) none of these | |
| 35. | The plasticity index is a) liquid limit and pla c) liquid limit and sh | s the numerical differe astic limit rinkage limit | ence between b) plastic limit and sh d) none | nrinkage limit |
| 36. | The coefficient of uni a) D_{10} to D_{60} | formity is the ratio of b) D_{10} to D_{30} | c) D_{30} to D_{10} | d) D_{60} to D_{10} |
| 37. | The property of a pointerconnected voids a) permeability | cous material which pe is called b) seepage | ermits the passage of w c) uplift | vater through its d) consolidation. |

M.Tech

| 38. 39. | Formula for porosity is a) $n = V_v/V$ b) $e = 0$ When the soil mass is saturated density c) saturated density | V_v/V_s ated, its bulk do | c) G = γ _s / γ _w ensity is called b) dry density d) none of these | d) $\gamma_d = W_d / V$ |
|------------|---|--|--|--|
| 40. | The plasticity index is the nu a) liquid limit and plastic lim c) liquid limit and shrinkage | merical differe nit limit | ence between b) plastic limit and sl d) none | hrinkage limit |
| 41. | Lacing member in a built up shear equal to a) 2.5% column load, c) 1.5% column load | p column is re b) 3.5% colun d) 2% columr | quired to be designed nn load 1 load plus additional | l to resist transverse shear due to BM. |
| 42. | Pitch of the bolt is the distar a) the direction of stress c) inclined direction | nce between tw b) direction p d) at 45° | o consecutive bolts in erpendicular to stress | |
| 43. | The compressive strength of a) net area c) yield strength | a structural m b)slenderness d) failure stre | ember is mainly influe ratio ss,. | enced by |
| 44. | If Es and Ec are the elastic : defined as a) Es/Ec b) Ec/ | modulii of stee Es | el and concrete, then a | modular ratio 'm' is |
| | u) L3/ LC 0) LC/ | L5 | C)1/ LCL3 | u) L3/ 2LC |
| 45. | The maximum percentage of a) magnesium oxide b) iror | chemical ingr oxide | edient of cement is tha c) alumina | t of d) silica |
| 46. | For massive dam construction a) Ordinary Portland cement c) Low heat cement | on, the type of o t | cement used is b) rapid hardening c d) blast furnace slag | ement cement |
| 47. | Los angles machine is used t a) Crushing strength c) Abrasion resistance | o test the aggre | egate for b) Impact value d) Water absorption | |
| 48. | An ordinary Portland ceme residue on I.S.seive no.9, mo a) 5% b) 10% | ent when teste re than 6 | ed for its fineness, sh c) 15% | ould not leave any d)20% |
| 49. | The product moment of ir reference to axes UU and V | nertia of the n /V is / | rectangular shape sho | own in figure with |
| | | 200 mm | U 400 mm | |

50. The horizontal movement at the roller support of the pin jointed frame shown in figure, with all members having an equal area of 300 mm^2 and E= $2 \times 10^5 \text{ N/mm}^2$



| 59. | Shape of true stress-s a) Strain | train curve for a mater b) Strain rate | rial depends on c) Temperature | d) All |
|-----|---|---|--|--------------------------------------|
| 60. | Toughness of a mate | rial is equal to area ur | nder par | t of the stress-strain |
| | a) Elastic | b) Plastic | c) Both | d) None |
| 61. | Web shear cracks are a) rectangular section c) I section with thin | likely to develop in pr is webs | restressed beams with b) Tee section d) none of the above | |
| 62. | A line which joins su a)check line | bsidiary stations on th b)base line | e main line is known a c)the line | s d)boundary line |
| 63. | A French cross staff c a)square box | consists of b)hexagonal box | c)octagonal box | d)ground box |
| 64. | The vertical angle be other attractive force a)bearing | etween the horizontal res) and the horizontal b)magnetic bearing | axis of a magnetic ne line at the point is call c)azimuth | eedle (free from all ed d)dip |
| 65. | Critical velocity ratio a) Full supply discha c) Type of silt carried | , in Kennedy's regime rge by canal | theory, depends on: b) Type on canal linir d) type of output | ıg |
| 66. | If the quadrantal beating would be a) 95º 42′ | aring of a place is N b) 174º 18′ | 5° 42′ W, the correspo c) 185° 42′ | onding whole circle d) 354º 18′ |
| 67. | The diameter of steel a)1mm | wire used for the fabr b) 4mm | ication of arrows is c) 10mm | d) 20mm |
| 68. | The length of ranging a)1m | g rod commonly used i b) 1.5m | is c) 2m | d)2.5m |
| 69. | The error which arise a)training error | e from in experience ar b) handing error | re known as c) personal error | d) mistake |
| 70. | Which one is not the a) 5m | standard metric chain b) 10m | length c) 20m | d) 25m |
| 71. | Which method gives a)mid ordinate rule c)trapezoidal rule | more accurate results | in the measurement of b)average ordinate ru d)simpson's rule | area ile |
| 72. | The leveling of instru- a) vertical axis is truly b) line of sight is truly c) optical axis is truly d) effect of curvature | ment is done so that y vertical y horizontal horizontal of earth is nullified | | |
| 73. | Water cement ratio th a) 0.40 | neoretically required fo b)0.23 | or hydration of cement c)0.30 | d)0.6 |

6

| 74. | The compound essen a)Alite | tially responsible for i b)Belite | nitial setting of cement c) Ferite | t is d)chlorate |
|-----|--|--|--|------------------------------|
| 75. | The normal air conter a)1% | nt of concrete mix is b)2% | c)4% | d)5% |
| 76. | Recycling of concrete a)Coarse aggregate c)Unhydrated cemen | reduces the strength o | due to b)Porosity and water d)Dust | absorption |
| 77. | As per IS456, the mashall not be less than | aximum strain in ten | sion reinforcement in | a section at failure |
| | a) 0.00380 | b. 0.0035 | c) 0.002 | d) 0.0042 |
| 78. | In a traverse the defle a) Included angle and c) Included angle and | ection angle is the diffe 1 90º 1 270º | erence between b) Included angle and d) Included angle and | d 180º d 360º |
| 79. | A long retaining wall a) plane stress proble c) axisymmetric prob | is a case of m lem | b) plane strain proble d) None of the above | em |
| 80. | When wind load is permissible stress per | the main load actin rmitted is | ng on a steel structu | re, the increase in |
| | a) 33% | b) 25% | c) 0 | d) 10% |
| 81. | The effective length restrained against rot | of a steel compression ation but not held in p | n member fixed at one position at the other en | e end, and partially d is |
| | a) 0.5L | b) L | c) $\frac{L}{\sqrt{2}}$ | d) 1.5L |
| 82. | For designing lacing a) actual shear comin c) 2.5% of axial load | in a steel column the t g to the column | ransverse shear to be ta b) 50% of axial load d) 25% of axial load | aken into account is |
| 83. | Bolts subjected to be interaction equations | oth shear and axial to , $	au_{u\!f}$ is shear stress an | ension shall satisfy or d $\sigma_{\scriptscriptstyle t\!f}$ is tensile stress | ne of the following |
| | a) $\frac{\tau_{uf}, c_{al}}{\tau_{uf}} + \frac{\sigma_{tf}, c_{al}}{\sigma_{tf}}$ | ≤1.4 | b) $\frac{\tau_{uf}, c_{al}}{\tau_{uf}} + \frac{\sigma_{tf}, c_{al}}{\sigma_{tf}}$ | - ≤1 |
| | c) $\frac{\tau_{uf}, c_{al}}{\tau_{uf}} + \frac{\sigma_{tf}, c_{al}}{\sigma_{tf}}$ | ≤1.2 | d) $\frac{\tau_{uf}, c_{al}}{\tau_{uf}} + \frac{\sigma_{uf}, c_{al}}{\sigma_{uf}}$ | ≤1.5 |
| 84. | The reactions at the le | eft support of the bean | n shown are | |
| | | 10 kN | | |
| | 1 | • | ` | |
| | 4 m | n 2 m | х х | |
| | a) 8 80 kNm 6 67 kN | | b) 4 44 kNm 3 22 kN | |

a) 8.89 kNm, 6.67 kNb) 4.44 kNm, 3.33 kNc) 8.89 kNm, 7.41kNd) 4.44 kNm, 2.59 kN

85. The number of mechanisms of failure of the structure shown is



| 95. | For $q = 5 \text{ m}^3/\text{sec} / \text{m}$ and $f = 0.9$, the scour depth R (m) is equal to: | | | | |
|--|--|-----------------|----------------------------------|-------------|--|
| | a) 7.89 | b) 6.49 | c) 4.09 | d)3.02 | |
| | | | | | |
| 96. | Turbidity is measured | d on | | | |
| | a) standard silica scal | e | b) standard cobalt sca | ıle | |
| | c) standard platinum | scale | d) platinum cobalt s | scale | |
| | , <u>1</u> | | , <u> </u> | | |
| 97. The most common cause of acidity in water is | | | | | |
| | a) carbon dioxide | b) oxygen | c) hydrogen | d) nitrogen | |
| | , | , , , , , | / / 0 | , 0 | |
| 98. | Abiotic environment does not include | | | | |
| | a) air | b) water | c) soil | d) plants | |
| | , | , | , | , 1 | |
| 99. | 71% of earth surface | is covered with | | | |
| | a) air | b) water | c) land | d) coal | |
| | | , | , | , | |
| 100. | The most serious environmental effect posed by hazardous wastes is | | | | |
| | a) air pollution. | _ | b) contamination of groundwater. | | |
| | c) increased use of land for landfills. | | d) destruction of hab | itat | |
| | | | | | |

Mechanical (Section Code-02)

- 1.Find the work done by a constant force $\overline{F} = 2\hat{\imath} + 4\hat{\jmath}$, if its point of application
to a block moves from A(1,1) to B(4,6)
a) 36b) 28c) 26d) 32
- 2. If $u(x, y) = x^3 3xy^2 5y$, then its harmonic conjugate function is

a)
$$3x^2y - y^3 + c$$

b) $3x^2y - y^3 + 5x + c$
c) $3x^2y - y^2 - 5x + c$
d) $3xy^2 - y^3 + 5x + c$

3. The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where D \equiv \frac{d}{dx}\right)$ is

a)
$$\frac{1}{30}(\cos 3x - \sin 3x)$$

b) $\frac{1}{30}(2\cos 3x + \sin 3x)$
c) $\frac{1}{30}(2\cos 3x - \sin 3x)$
d) $\frac{1}{30}(\cos 3x - \sin 3x)$

4. The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is a) 2.6875 b) 2.3232 c) 2.7998 d) 2.1001

5. if
$$\overline{F} = (3x^2 - 3yz)\hat{i} + (3y^2 - 3zx)\hat{j} + (3z^2 - 3xy)\hat{k}$$
, then div \overline{F} is
a) $6(x+y+z)$ b) $6(x-y-z)$ c) $3(x+y+z)$ d) $2(x+y+z)$

6. If X is a poisson variate such that
$$P(X=1)=\frac{3}{10}$$
 and $P(X=2)=\frac{1}{5}$, find λ
a) $\frac{3}{4}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{1}{4}$
7. If $A+B=\begin{pmatrix} 1 & -1\\ 0 & -3 \end{pmatrix}$ and $A-B\begin{pmatrix} 3 & 1\\ 1 & 4 \end{pmatrix}$, then the product AB is
a) $\begin{pmatrix} -1 & -1\\ 0 & -3 \end{pmatrix}$ b) $\begin{pmatrix} 0 & -1\\ -1 & -3 \end{pmatrix}$ c) $\begin{pmatrix} 0 & -6\\ -2 & -2 \end{pmatrix}$ d) $\begin{pmatrix} -2 & -2\\ 0 & -6 \end{pmatrix}$
8. The value of $\int_{0}^{\frac{\pi}{2}} \cos^{6} x \, dx$ is

a)
$$\frac{3\pi}{32}$$
 b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$ d) $\frac{\pi}{32}$

9. Find the points at which the function $f(z) = \frac{z}{z^2 - 1}$ is not analytic.

a)
$$z = \pm 1$$
 b) $z = \pm 2$ c) $z = 1$ d) $z = -1$

10. If
$$x = a (\cos t + t \sin t)$$
, $y = a (\sin t - t \cos t)$, find $\frac{dy}{dx}$
a) cot t b) cosec t c) sec t d) tan t

| 11. | A force which combines with two or more forces to produce equilibrium is called | | | | |
|-----|---|--|--|--|--|
| | a) resultant | b) equilibrium | c) couple | d) moment | |
| 12. | The angle betweer respectively is | two forces when | resultant is maximu | am and minimum | |
| | a) 0^0 and 180^0 | b) 180° and 0° | c) 90° and 180° | d) 90° and 0° | |
| 13. | A train crosses a tu and exit from the remains constant, th | nnel in 30 seconds tunnel are 36 and he length of the tunr | time. The speed of th 54 km/hr respective nel is | ne train at entry to ely. If acceleration | |
| | a) 350 m | b) 360 m | c) 375 m | d) 400 m | |
| 14. | The moment of iner gravity is | rtia of a square of sic | le a) about an axis th | rough its centre of | |
| | a) $a^4/4$ | b) a ⁴ /8 | c) a ⁴ /12 | d) a ⁴ /36 | |
| 15. | The friction experie | nced by a body, wh | en in motion, is knov | vn as | |
| | a) rolling friction | | b) dynamic friction | | |
| | c) limiting friction | | d) static friction | | |
| 16. | The metal suitable | for bearings subjecte | d to heavy loads is | | |
| | a) silicon bronze c) monel metal | | d) white metal | e | |
| 4 🗖 | | 1. 1 11 1 | | | |
| 17. | stress induced in th | applied suddenly of e bar will be | on a bar of cross-sec | ctional area A, the | |
| | a) $\frac{W}{A}$ | b) $\frac{W}{24}$ | c) $\frac{2W}{A}$ | d) $\frac{3W}{4}$ | |
| 10 | Million o circulor h | com of diamotor d | is subjected to a | aboor force E the | |
| 18. | maximum shear str | eam of diameter d | is subjected to a s | snear force F, the | |
| | a) $\frac{4F}{\pi d^2}$ | b) $\frac{6F}{\pi d^2}$ | c) $\frac{8F}{\pi d^2}$ | d) $\frac{16F}{2\pi d^2}$ | |
| 10 | | <i>nu</i> | 1 | Snu | |
| 19. | a) longitudinal stre | ressure vessel 1s bas ss | ed on b) hoop stress | | |
| | c) longitudinal and | hoop stress | d) shear stress | | |
| 20. | The permissible str equal leg lengths weldment per cm le | ress in the fillet we of 15 mm each. ' | ld is 100 N/mm². T The allowable shea | The fillet weld has ring load on the | |
| | a) 7.5 KN | b) 10.6 KN | c) 15 KN | d) 22.5 KN | |
| 21. | The relation betwo modulus (K) is give | een Young's modu en by | lus (E), shear mod | ulus c) and bulk | |
| | a) $E = \frac{3K.C}{3K+C}$ | b) $E = \frac{6K.C}{3K+C}$ | c) $E = \frac{9K.C}{3K+C}$ | d) $E = \frac{12K.C}{3K+C}$ | |
| | | | | | |

| 22. | The point of contra a) shear force chang c) shear force is ma | flexure is a point wh ges sign ximum | nere b) bending momen d) bending momen | t changes sign t is maximum |
|-----|--|---|---|--|
| 23. | A thin cylinder of kg_{f}/cm^{2} . If the long and 450 kg_{f}/cm^{2} , th a) 1.3 cm | internal diameter 1. itudinal and circum e thickness of cylind b) 1.7 cm | 2 m contains fluid a ferential stresses are er should be nearest c) 3.4 cm | t a pressure of 20 not to exceed 350 to d) 2.6 cm |
| 24. | The polar moment of a) $\left(\frac{\pi D^3}{16}\right)$ | of inertia of a solid c b) $\frac{\pi D^3}{32}$ | ircular shaft of diame c) $\frac{\pi D^4}{32}$ | eter d) is d) $\frac{\pi D^4}{64}$ |
| 25. | The Rankine's form a) short columns c) both short and lo | uula holds well for ng columns | b) long columns d) weak columns | |
| 26. | Henry ford is noted a) standardization o c) assembly line ope | l for his contribution of parts erations | s to b) statistical quality d) time and motion | control studies |
| 27. | Which of the follow a) pricing | ving is not an elemer b) staffing | t of the management c) planning | t process? d) controlling |
| 28. | Productivity measu a) the competition's b) the fact that prec c) stable quality d) the workforce siz | rement is complicate output ise units of measure ze | ed by are often unavailable | e |
| 29. | The delphi method a) decision-making c) overhead rate est | is best suited for imating | b) cost control d) team discussions | 3 |
| 30. | Which of the follow a) Gantt chart c) Fishbone diagram | ring is not an examp n | le of a type of schedu b) milestone chart d) network diagran | ıle report? 1 |
| 31. | The Poisson's ratio a) 0.23 to 0.27 | for cast iron varies f b) 0.25 to 0.33 | rom c) 0.31 to 0.34 | d) 0.32 to 0.42 |
| 32. | Which of the follo connecting rod? a) spigot and socke c) gib and cotter join | wing cotter joint w t cotter joint nt | ill be used to conne b) sleeve and cotter d) V-joint | ect strap end of a joint |

33. What are the two ways that a company can obtain new products?

| | a) new-product development and acquisition b) service development and product extension c) internal development and merger d) line extension and brand management | | | | |
|-----|--|--|--|--|--|
| 34. | A machine having an efficiency less than 50%, is known as a) reversible machine b) non-reversible machine c) neither reversible nor non-reversible machine d) ideal machine | | | | |
| 35. | A model which considers uncertainty as a) descriptive modal c) deterministic model | s an important aspect of the problem is b) stochastic model d) dynamic model | | | |
| 36. | The penalty costs that are incurred as known as a) shortage cost c) handling cost | a result of running out of stock are b) set-up cost d) capital cost | | | |
| 37. | A customer may leave the queue, if the a) reneging b) balking | re is no waiting space is called as c) jockeying d) priorities | | | |
| 38. | Jigs are used a) for holding and guiding the tool in de b) for holding the work in milling, grind c) to check the accuracy of work piece d) to assemble the finished work pieces | rilling, reaming operations ding, planning operations | | | |
| 39. | The floating position of the holding fix to a) improve the accuracy of location b) reduce the tendency to over-index c) improve upon the acceleration and de d) reduce the cycle time | ture in a rotary transfer device is used eceleration characteristics | | | |
| 40. | The diamond locating pin is used in jigs a) diamond is very hard and wear resist b) it occupies very little space c) it helps in assembly with tolerance or d) it has a long life | s and fixtures because tant n centre distance | | | |
| 41. | Super conduction by metals is observed a) below 10 ⁰ K c) around 0 ⁰ C | l in the temperature range of b) above 100º K d) around 100º C | | | |
| 42. | Annealing of white cast iron results in p a) malleable iron c) spheroidal iron | broduction of b) nodular iron d) grey iron | | | |

| 43. | Inconel is an alloy of a) nickel, chromium c) nickel, chromium and iron | b) nickel, copper d) nickel, zinc |
|-----|---|--|
| 44. | Connecting rod is usually made of a) cast iron c) low carbon steel | b) medium carbon steel d) high carbon steel |
| 45. | Steel made from phosphatic iron is a) hard c) ductile | b) brittle d) tough |
| 46. | solder is an alloy of a) tin, antimony, and copper c) tin and lead | b) tin and copper d) lead and zinc |
| 47. | Cemented carbide tools are not found t a) brass c) steel | o be suitable for cutting b) cast iron d) aluminium |
| 48. | Diamond has a) low heat conductivity c) lowest thermal expansion | b) high electrical conductivity d) high coefficient of friction |
| 49. | Which of the following moulding thermoplastic materials a) extrusion c) casting | methods is generally not used for b) injection d) calendaring |
| 50. | The percentage of chromium in HSS to a) 4% b) 18% | ol steel is c) 1% d) 0.1% |
| 51. | Fluxes are used in welding in order surfaces to be jointed from a) oxidation c) dirt | to protect the molten metal and the b) carburizing d) distortion and warping |
| 52. | Preheating is essential in welding a) HSS c) cast iron | b) stainless steel d) aluminium |
| 53. | Neutral flame has a) 1 zone c) 3 zones | b) 2 zones d) 4 zones |
| 54. | Facing sand used in foundry work com a) alumina, silica, and clay c) alumina, and clay | prises of b) silica, and clay d) alumina, and silica |

| 55. | Fetling is an operation a) before casting c) after casting | on performed | b) during casting d) after heat treatme | ent |
|-----|--|---|---|--|
| 56. | The increase in hard a) work hardening c) cold hardening | ness due to cold wo | orking is called b) hot hardening d) age-hardening | |
| 57. | Which of the followi a) hobbing c) milling | ing is a gear finishin | ng operation? b) shaping d) shaving | |
| 58. | Average cutting spe H.S.S is a) 10 m/min c) 30 m/min | ed in machining m | ild steel by single po b) 20 m/min d) 40 m/min | oint cutting tool of |
| 59. | In a shaper machine a) Geneva mechanis c) ward-leonard syst | , the mechanism for m tem | tool feed is b) whitworth mecha d) ratchet and pawl | anism mechanism |
| 60. | A side and face cut speed of 14 m/min the cutter is a) 10 mm c) 0.286 mm | ter 125mm diamete n with a table traver | r has 10 teeth. It ope rse 100 mm/min. The b) 2.86 mm d) 28.6 mm | erates at a cutting e feed per tooth of |
| 61. | The ease with which a) repeatability c) sensitivity | n observation can be | made accurately is r b) readability d) precision | referred to as |
| 62. | Optical flats are mad a) quartz | le of b) plastic | c) glass | d) silicon |
| 63. | Plug gauges are use a) measure the diam b) measure the diam c) check the diamete d) check the outside | d to neter of work piece neter of holes in wor er of the holes in wor diameter of work p | k piece rk piece iece | |
| 64. | Best wire size in effe a) p/2 sec x | ect diameter measur b) p sec x/2 | ement is c) p cos x/2 | d) p/2 cos x/2 |
| 65. | The normal chordal a) tooth crest to the p b) tooth crest to mid c) mid point of the c d) from the tooth cre | tooth thickness of a point of chord point of the chord onst chord to the tip est to any point on th | gear is shortest dista o of the tooth he chord | ance from the |

| 66. | X and R charts are used to find out | 1 | |
|-----|--|---|------------------------------------|
| | a) production control | b) cost control | |
| | c) process control | d) material control | |
| 67. | In a double sampling plan, second s defectives in the first sample | ample is taken whe | en the number of |
| | a) exceeds c ₂ | b) exceeds c1 but do | es not exceed c ₂ |
| | c) does not exceed c ₁ | d) exceeds both $c_1 a$ | nd c ₂ |
| 68 | If the lower control limit of a R chart ha | s a negative value it | is |
| 00. | a) eliminated from the chart | b) treated as negative | ve only |
| | c) treated as negative only | d) equated to zero | |
| 69. | Break-even analysis consists of | | |
| 021 | a) fixed cost | b) variable cost | |
| | c) fixed and variable costs | d) operation costs | |
| | , | / 1 | |
| 70. | In a single sampling plan N=20, n=10, inspection are 3 then the decision will b | C=2 and the actual de | efectives found by |
| | a) accept the lot | b) reject the lot | |
| | c) take a second sample | d) none of the abov | e |
| 71. | The predominant mode of heat trans. would be | fer from boiler furn | ace to water wall |
| | a) convection | b) conduction | |
| | c) radiation | d) conduction and co | nvection |
| 72. | Laminar sub-layer may develop during | flow over a flat-plat | e. It exists in |
| | c) turbulent zone | d) transition and turk | oulent zone |
| | | , | |
| 73. | A 1/25 model of a ship is to be tested speed of the prototype is 1.0 m/s, then tested is | d for estimating the the speed at which t | wave drag. If the he model must be |
| | a) 0.02 m/s b) 0.2 m/s | c) 5 m/s | d) 25 m/s |
| 74. | A regenerative steam cycle renders a) increased work output per unit mass of s b) decreased work output per unit mass of | steam steam | , . |
| | c) increased thermal efficiency | | |
| | d) decreased thermal efficiency | | |
| | | | |
| 75. | The ratio of heat flow Q_1/Q_2 from two | o walls of same thick | kness having their |
| | thermal conductivities as $k_1 = 2k_2$ will k | | A (F |
| | a) 1 D) 2 | C) 5 | u) 4 |
| | | | |

M.Tech

| 76. | An electric cable made up of aluminium conductor ($k = 240 \text{ W/mK}$) is to k insulated with rubber ($k=0.15 \text{ W/mK}$) and surrounded by air ($h = 6 \text{ W/m}^2\text{K}$). The critical insulation of thickness will be | | | 10 W/mK) is to be air (h = 6 W/m ² K). |
|-----|---|--|---|---|
| | a) 800 mm | b) 160 mm | c) 40 mm | d) 25 mm |
| 77. | The COP of heat p a) $COP_{HP} = COP_R+1$ c) $COP_{HP} / COP_R = 2$ | ump and that of refri 1 | gerator has the relation b) COP _R = COP _{HP} +1 d) COP _{HP} / COP _R < 2 | ion of L |
| 78. | During sensible co a)Relative humidity b) Partial pressure re c) Wet bulb tempera d) Dry bulb tempera | oling remains constant emains constant ture remains constant ture remains constant | | |
| 79. | The centrifugal pu a) forward curved c) straight | mp gives maximum | efficiency when its b b) backward curved d) wave shaped | lades are |
| 80. | The latent heat lo value of SHF is equ | ad in an auditorium 1al to | is 25% of the sensi | ble heat load. The |
| | a) 0.25 | b) 0.50 | c) 0.80 | d) 1.0 |
| 81. | In a 6x6 transport filled slots were | ation problem, dege | eneracy would arise, | , if the number of |
| | c) less than 11 | | d) equal to 12 | |
| 82. | For infinite paralle for radiation from | el planes with emissi n one surface another | vity of 0.8 each, the is | interchange factor |
| | a) 0.46 c) 0.76 | | b) 0.56 d) 0.66 | |
| 83. | The acoustic veloc difference in specif a) 401 m/s c) 12.7 m/s | ity of isentropic flow fic heat 0.287 kJ/kg-F | of air having specific (at a temperature 40 b) 520 m/s d) 16.4 m/s | c heat ratio 1.4 and 0 °C is |
| 84. | In a condenser of a enters at 30°C and a) 12.6°C | a power plant, steam leaves at 45°C. The I b) 21.6°C | condenses at 60°C. MTD of the condens. c) 16.2 °C | The cooling water ser is d) 26.2°C |
| 85. | Which one of the f a) quality control c) operator training | ollowing step would | lead to interchangea b) product design d) process planning | bility? |
| 86. | The value of entha kJ/kg and 1800 steam consumption | llpy of steam at inlet kJ/kg respectively. n in kg/kW-hr is | and outlet of a Rank Neglecting pump | kine cycle are 2800 work, the specific |
| | a) 1.0 | b) 0.36 | c) 0.28 | d) 3.6 |

| 87. | In time study, the r a) standard time of a c) fixation of incentiv | rating factor is appl job ve rate | lied to determine b) normal time of d) merit rating of | a job the worker |
|-----|--|---|--|---|
| 88. | In case of a comp because the compr a) at high speed c) at very high speed | ressor, isothermal essor in that case sl l | compression in pr hould run b) at zero speed d) at very slow sp | actice is not possible eed |
| 89. | Most commonly used valve mechanisms used in modern cars is a) Overhead valve mechanism b) Side valve mechanism c) Overhead inlet valve and side exhaust valve d) Overhead exhaust valve and side inlet valve | | | cars is |
| 90. | The ratio between a) 1:1 | the speed of the ca b) 1:4 | mshaft and the spee c) 1:2 | ed of the crankshaft is d) 1:3 |
| 91. | A compressor is compressor a) delivers 5m ³ / min b) compresses 5m ³ / r c) compresses 5m ³ / r d) delivers 5m ³ /min | having a capaci of compressed air min of standard air min of free air of free air | ty of 5m ³ /min. T | [°] his means that the |
| 92. | Orsat apparatus is a) Ultimate analysis b) Gravimetric analy c) Gravimetric analy d) Volumetric analys | used to determine of fuel sis of fuel sis of combustion pro | oducts oducts | |
| 93. | The term 'value' in value engineering refers to a) total cost of the product b) selling price of the product c) depreciation value of the product d) utility of the product | | | |
| 94. | In a vapour compression refrigeration system, throttle valve is used in place of an expander because a) It considerable reduces the system weight b) It improves the COP as the condenser is small c) The positive work in isentropic expansion of liquid is very small d) It leads to significant cost reduction | | | |
| 95. | The standard time was rated at 80%. observed time wou a) 6.5 min | e of an operation ha If the relaxation as ild be b) 8 min | as been calculated a nd other allowance c) 10 min | s 10 min. The worker s were 25%, then the d) 12.5 min |

| 96. | Two alternative methods can produce a product, first method has a fixed cost of Rs.2000/- and variable cost Rs.20/per piece. The second method has fixed cost of Rs.1500/- and a variable cost of Rs.30/ The break even quantity between the two alternatives is | | | |
|------|--|---|---|---------------------|
| | a) 25 | b) 50 | c) 75 | d) 100 |
| 97. | The calorific value determined by the bomb calorimeter is a) lower calorific value at constant pressure b) lower calorific value at constant volume c) higher calorific value at constant pressure d) higher calorific value at constant volume | | | |
| 98. | In milk chilling plan a) brine | nts, the usual second b) ammonia | ary refrigerant is c) glycol | d) silicate |
| 99. | The work done by an engine is 15 kJ per cycle and the piston displacement of the engine is 0.02 m ³ , the mean effective pressure is a) 6.5 bar b) 7.5 bar c) 8.5 bar d) 9.5 bar | | | |
| 100. | At 100% relative hu a)more than dry bulb c) equal to ambient | umidity, the wet bulk temperature temperature | b temperature is b) less than dew poin d) same as dew poi | t temperature nt |

Electrical (Section Code-03)

1. Find the work done by a constant force $\overline{F} = 2\hat{i} + 4\hat{j}$, if its point of application to a block moves from A(1,1) to B(4,6)

2. If
$$u(x, y) = x^3 - 3xy^2 - 5y$$
, then its harmonic conjugate function is

a)
$$3x^2y - y^3 + c$$

c) $3x^2y - y^2 - 5x + c$
b) $3x^2y - y^3 + 5x + c$
d) $3xy^2 - y^3 + 5x + c$

3. The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where \ D \equiv \frac{d}{dx}\right)$ is a) $\frac{1}{30}(\cos 3x - \sin 3x)$ b) $\frac{1}{30}(2\cos 3x + \sin 3x)$

c)
$$\frac{1}{30}(2\cos 3x - \sin 3x)$$
 d) $\frac{1}{30}(\cos 3x - \sin 3x)$

4. The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is

5. if
$$\overline{F} = (3x^2 - 3yz)\hat{i} + (3y^2 - 3zx)\hat{j} + (3z^2 - 3xy)\hat{k}$$
, then div \overline{F} is
a) $6(x+y+z)$ b) $6(x-y-z)$ c) $3(x+y+z)$ d) $2(x+y+z)$

6. If X is a poisson variate such that
$$P(X=1)=\frac{3}{10}$$
 and $P(X=2)=\frac{1}{5}$, find λ
a) $\frac{3}{4}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{1}{4}$

7. If
$$A+B=\begin{pmatrix} 1 & -1 \\ 0 & -3 \end{pmatrix}$$
 and $A-B\begin{pmatrix} 3 & 1 \\ 1 & 4 \end{pmatrix}$, then the product AB is
a) $\begin{pmatrix} -1 & -1 \\ 0 & -3 \end{pmatrix}$ b) $\begin{pmatrix} 0 & -1 \\ -1 & -3 \end{pmatrix}$ c) $\begin{pmatrix} 0 & -6 \\ -2 & -2 \end{pmatrix}$ d) $\begin{pmatrix} -2 & -2 \\ 0 & -6 \end{pmatrix}$

8. The value of
$$\int_0^{\frac{\pi}{2}} \cos^6 x \, dx$$
 is

a)
$$\frac{3\pi}{32}$$
 b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$ d) $\frac{\pi}{32}$

9. Find the points at which the function $f(z) = \frac{z}{z^2 - 1}$ is not analytic.

a)
$$z = \pm 1$$
 b) $z = \pm 2$ c) $z = 1$ d) $z = -1$

10. If
$$x = a (\cos t + t \sin t)$$
, $y = a (\sin t - t \cos t)$, find $\frac{dy}{dx}$

a) cot t b) cosec t c) sec t d) tan t

11. Which of the following equation represents the Gauss's law in a homogeneous isotropic medium?

a)
$$\nabla \times \overline{B} = \underset{0}{\mu} \overline{J}$$

b) $\nabla \times H = D$
c) $\nabla J + \rho = 0$
d) $\nabla E = \rho / \varepsilon$

12. A material is described by the following electrical parameters at a frequency of 10GHz; $\sigma = 10^6$ mho/m; $\mu = \mu$ and $\sigma/\sigma_0 = 10$. The material at this frequency is

considered to be
$$\left(\sigma = \frac{1}{36\pi} \times 10^{-9} F/m\right)$$
;
a) a good conductor
b) a good dielectric
c) neither a good conductor, nor a good dielectric
d) a good magnetic material

- 13. An electric dipole of moment P is placed in front of a grounded sphere at a distance 'd'. The charge induced on the surface of the sphere is (R-Radius of the sphere);
 a) zero
 b) PR / d²
 c) PR² / d³
 d) PR³ / d⁴
- 14.Three concentric conducting spherical surfaces of radius R_1 , R_2 and R_3 ($R_1 < R_2 < R_3$)
carry charges of -1, -2 and 4 coulombs respectively. The charges on the inner and
outer surfaces of the outermost sphere will be respectively (in coulombs)
a) 0,4 b) 3,1 c) -3,7 d) -2,6
- 15. A radial field $\overline{H} = \frac{2.39 \times 10^6}{r} \cos\phi \,\overline{a}r \,\text{A/m}$ exists in free space. Magnetic flux ϕ crossing the surface defined by $-\frac{\pi}{4} \le \phi \le \frac{\pi}{4}$ and $0 \le Z \le 1m$ will be a) 6.3wb b) 8.48wb c) 4.24wb d) 3.16wb
- 16. Which one of the following statement(s) does not pertain to the equation ∇.B=0?
 a) There are no sinks and sources for magnetic fields
 b) Magnetic field is perpendicular to the electric field
 c) Single magnetic pole cannot exist
 d) B is solenoidal
- 17. As a result of reflections from a phase conducting wall, electromagnetic waves acquire an apparent velocity greater than the velocity of light in space. This is called the
 a) velocity of propagation
 b) normal velocity
 c) group of propagation
 d) phase velocity

 18. Ampere second could be the unit of
- a) power b) conductance c) energy d) charge
- A cylindrical wire is compressed in length by 10%. The percentage decrease in the resistance will be
 a) 16%
 b) 19%
 c) 20%
 d) 25%

20. Three resistance of 6 ohm each are connected as shown in Figure given below. The equivalent resistance between X_1 and X_2 is





In the control system shown above the controller which can give zero steady- state error to a ramp input is of

a) proportional type

c) Derivative type

b) Integral type

d) Proportional plus derivative type

d) 1 and 2

- 30. A self excited d.c shunt generator, driven by its prime mover at the rated speed fails to build up the voltage across its terminals at no load. What reason can be assigned for this?
 - a) The initial shunt field mm does not assist the residual magnetism
 - b) The field circuit resistance is higher than the critical resistance
 - c) One of the inter-pole connections is removed
 - d) Brush axis slightly shift from the geometrical neutral axis of the machine

c)3 and 4

- 31. Armature torque of a d.c motor is a function of which of the following factors1. Speed2. Field Flux
 - 2. Field Flux
 - 3. Armature Current
 - 4. Residual Magnetism

Select the correct answer a) 2 and 3 b) 1 and 4

| 32. | The induced voltage in a single loop reverses: | | |
|-----|--|---------------------------------|--|
| | a) Once in each revolution | b) Once in each half revolution | |
| | c) Once in each one quarter revolution | d) Once in each two revolutions | |

33. If the supply voltage of the induction motor is reduced by 10%. By what percentage approximately will the maximum torque decreases?a) 5%b) 10%c) 20%d) 40%

- 35. A single phase Induction motor is running at N rpm. Its synchronous speed is Ns. If its slip with respect to forward field is 's', what is the slip with respect to the backward field is:
 a) s
 b) -s
 c) (1-s)
 d) (2-s)
- 36. Which type of emf is induced in the dc generator ?a) Dynamicallyb) Staticc) Electrostaticd) Magentic

| 37. | Possible three to three phase transformer c a) Delta-Star to Delta-Star c) Star-Star to Delta-Star | connection for parallel b) Delta-Delta to Del d) Delta-Star to Star- | operation is: ta-Star Delta |
|-----|--|--|--|
| 38. | Which of the following which is not a transformer?a) Additional copper lossesb) Resonance between winding reactance a c) Increased core lossesd) Increased electro magnetic interference | an effect of the harm and feeder capacitance with communication c | nonic currents in a ircuits. |
| 39. | Application of DC motors is generally re because of a) cost of the motor is high b) problems with mechanical commutation c) Maintenance problems d) None of the above | estricted to a few loac | l speed applications |
| 40. | If a single phase induction motor runs slov a) improper fuse c) open starting winding | wer than normal the pr b) shorted running v d) worn bearings | oblem is vinding |
| 41. | If a DC series motor is operated on AC sup a) Have poor efficiency c) spark excessively | pply it will b) have poor power d) all of the above | factor |
| 42. | The maximum value of torque angle in a s a) 45 c) 90 | ynchronous motor in e b) between 45 and 90 d) above 60 | lectrical degrees is) |
| 43. | In a synchronous generator in order to angle should be a) 9° b) 18° | eliminate the fifth har c) 27° | monic the chording d) 36°. |
| 44. | A hunting sound is produced in a synchro a) load fluctuates c) both a) and b) above | nous motor when b) supply frequency d) none of the above | varies |
| 45. | Which one of the following statements is stating in case of shunt and compound more a) Maximum, because motor torque torque. b) Maximum, because voltage should c) Maximum, because small excitating during starting. d) It can be anything because it does not a stating beca | correct for the ideal fie otors? required to overcome be built slowly. on will lead to low not matter in case of th | eld excitation during e friction and load w operating speed hese motors |
| 46. | An eight pole de generator has a simple w 6 turns each. Its flux per pole is 0.06 Wb induced armature voltage is: a) 96 V b) 192 V | vave wound armature o b. The machine is runn c) 384 V | containing 32 coils of ing at 250 rpm. The d) 768 V |

47. A 440 V, e-phase, 10 pole and 50 Hz synchronous motor delivering a torque of p 50 Nm, delivers a power of:

| | | | 1) 0000 111 |
|---------|----------|-----------|-------------|
| a) 50 W | b) 500 W | c) 1000 W | d) 2000 W |

- 48. The emf induced in a conductor of machine driven at 600 rpm, the peak value of flux density is 1.0 Wb/m2, diameter of machine 2.0 meter and length of machine 0.30 m is:
 - a) 41. 83 V b) 29.58 V c) 9.42 V d) 18.84 V
- 49. Which three-phase connection can be used in a transformer to introduce a phase difference of 300 between its output and corresponding input line voltages?
 - a) Star-star b) Star-delta c) Delta-delta d) Delta-Zigzag
- 50. When one transformer is removed from a D-D bank of 30 kVA transformer, the capacity of the resulting 3-phase transformer in V-V connection will be:
 - a) 11.5 kVA b) 17.3 kVA c) 20 kVA d) 25.9 kVA
- 51. A two-winding 220 V/110 V, 1.5 kVA transformer is reconnected as a 220/330 auto-transformer. It is re-rated as:
 - a) 3.88 kVA b) 4.488 kVA c) 1.58 kVA d) 2.258 kVA
- 52. The full-load copper-loss and iron-loss of a transformer are 6400 W and 500 W respectively. The above copper loss and iron loss at half load will be:

| a) 3200 W and 250 W respectively | b) 3200 W and 500 W respectively |
|----------------------------------|----------------------------------|
| c) 1600 W and 125 W respectively | d) 1600 W and 500 W respectively |

53. What is the waveform of the current flowing through the diode in a buck-boost converter?a) Square waveb) Triangular Wave

| a) Square wave | b) Irlangular wave |
|---------------------|--------------------|
| c) Trapezoidal wave | d) Sinusoidal wave |

- 54. The use of multiphase rectifier in place of 1-phase rectifier results in:
 - a) Increased output voltage and reduced harmonics
 - b) Increased output voltage and increased harmonics
 - c) Decreased output voltage and reduced harmonics
 - d) Increased output voltage and no effect on harmonics
- 55. An advantage of a cycloconverter is:
 a) Very good power factor
 b) Requires few number of thyristors
 c) Commutation failure does not short circuit the source
 d) Load commutation is possible
- 56. For low-speed high-power reversible operation, the most suitable drives are:

| | a) voltage source invb) Current source invc) Dual converter bed) Cycloconverter be | verter bed ac drives verter bed ac drives d dc drives ed ac drives | | |
|-----|--|---|---|--------------------|
| 57. | Consider the followi | ing statements: | | |
| | A thyristor require The voltage drop A thyristor require A transistor draws Which of these states | es turn off circuit while of a thyristor is less that es a continuous gate cu s continuous base curr ments are correct? | e transistor does not an that of a transistor. urrent. ent | |
| | a) 1, 2, 3 and 4 | b) 1 and 2 | c) 2 and 4 | d) 1 and 4 |
| 58. | Which one of the fol | lowing statements is N | NOT correct for a MOS | FET? |
| | a) Are easy to paralleb) Leakage current isc) Have more lineard) Overload and pear | el for higher current s relatively high characteristic ık current handling caj | pability are high | |
| 59. | A thyristor can be switched from a non-conducting state to a conducting state by applying: 1. Voltage more than forward break over voltage 2. A voltage with high dt / dv 3. Positive gate current with +ve anode voltage 4. Negative gate current with positive anode voltage | | | |
| | a) 1, 2, 3 and 4 are co c) 1, 2 and 3 are corr | orrect ect | b) 1, 2 and 4 are corr d) 2, 3 and 4 are corr | ect ect |
| 60. | An SCR is in cond cathode, but it fails t a) Positive voltage is b) The reverse voltag c) The anode current d) Turn off time of S | ucting state, a revers to turn off. What could applied to the gage. ge is small t is more than the hold CR is large | e voltage is applied be the reason? ing current | between anode and |
| 61. | A long specimen of p-type semiconductor material a) is positively charged b) is electrically neutral c) has an electric field directed along its length d) acts as dipole | | | |
| 62. | As the temperature constant current. a) Increases b) Decreases c)Remains constant d)May increase or de | e is increased, the vo | oltage across a diode | carrying a diode a |

- 63. Two p-n junction diodes are connected back to back to make a transistor. Which one of the following is correct?
 - a) The current gain of such a transistor will be high
 - b) The current gain of such a transistor will be moderate
 - c) It cannot be used as a transistor due to large base width
 - d) It can be used only for pnp transistor.
- 64. A Triangular-square wave generator uses
 - a) A sine wave oscillation and comparator
 - b) An integrator and a comparator
 - c) A differentiator and a comparator
 - d) A sine wave oscillator and a clipper
- 65. In BJT amplifier with the introduction of feedback, the input impedance is reduced, output impedance is increased, bandwidth is increased and distortion is reduced. The feed back is

| a) Voltage series | b) Current series |
|-------------------|-------------------|
| c) Voltage shunt | d) Current shunt |

- 66. In an RC coupled amplifier, the gain decreases in the frequency response due to the
 - a) Coupling capacitor at low frequency and bypass capacitor at high frequency
 - b) Coupling capacitor at high frequency arid bypass capacitor at low frequency
 - c) Coupling junction capacitance at low frequency and coupling capacitor at high frequency.
 - d) Device junction capacitor at high frequency and coupling capacitor at low frequency.
- 67. The open -loop voltage gain of an amplifier is 240. The noise level in the output without feedback is 100mV. If a negative feedback with $\beta = 1/60$ is used, the noise level in the output will be a) 1.66 mV b) 2.4 mV c) 4.0 mV d) 20 mV
- 68. The threshold voltage of an N-channel MOSFET can be increased by
 a) Increasing the channel dopant concentration
 b) Reducing the channel dopant concentration
 c) Reducing the gate-oxide thickness
 d) Reducing the channel gain
- 69. The conduction loss versus device current characteristic of a power MOSFET is best approximated by
 a) a parabola
 b) a straight line
 c) a rectangular hyperbola
 b) a straight line
 d) an exponentially decaying function
- 70. In a negative feedback amplifier, when is the input impedance increased?
 a) If the signal sampled is a voltage
 b) If the signal sampled is a current
 c) If the feedback signal is a voltage
 d) If the feedback signal is a current.
- 71.A depletion type NMOS is operated in enhancement mode. Vp = -4 volts. For $V_{GS} = +3V$ as V_{DS} is increased, +D becomes nearly constant when Vds equals
a) 1 voltsb) 3 voltsc) 4 voltsd) 7 volts

| 72. | 80A 7411 is a a) op-amp, monolithic and short circuit protection in built b) 2 input NAND gate c) 3 input NAND gate with open collator output d) none of these | | | | |
|-----|--|--|---|--|--|
| 73. | The astable multivib a) two stable states c) two quasi-stable s | rator has tates | b) one stable, one d) none of these | e quasi stable | |
| 74. | Which of the following circuit exhibits mer a) astable multivibrator c) NAND gate | | nory? b) bistable multiv d) EX-OR gate | nory? b) bistable multivibrator d) EX-OR gate | |
| 75. | 5. A circuit in which the output voltage waveform is the integral of the input | | | | |
| | a) integrator c) logarithmic ampli | fier | b) differentiator d) comparator | | |
| 76. | The following is a general purpose regulator a) IC723 b) IC741 c) LM320-15 d) LM325H | | | d) LM325H | |
| 77. | The transfer function a) $\frac{AoW_h}{S+wh}$ | n of a first order LPF is | b) $\frac{AoY_1Y_2}{S}$ | | |
| | c) $\frac{Ao(S^2 + Wo^2)}{(S + wh)}$ | | d) $\frac{AoWh^2}{S^2 + \alpha Wos + \gamma}$ | $\overline{wh^2}$ | |
| 78. | Polycrystalline silico | on when doped with p of aluminium | hosphorus is cond | uctive as can be used as | |
| | a) gate electrode c) source electrode | | b) drain electrode d) none of the ab | e ove | |
| 79. | 8096 microcontroller a) 8 bit | is b)16 bit | c) 4 bit | d) 32 bit | |
| 80. | The multiplication ti a) 32 μ sec | me for 10 bit numbers b) 20µ sec | with 1MHz clock w c) 21µ sec | will be d) 22µ sec | |
| 81. | In boolean algebra, e $X \oplus T = X$ or Y bu expressions (X \oplus X+ X | exclusive and coincident the not both X O Y $(O X)$ and $(X \oplus 1 + X O)$ | nce operations are = either (X.Y) or O 1) are | defined as below: $(\overline{X}.\overline{Y})$. Then the two | |
| | a) equal to 1 | b) equal to 0 | c) equal to x | d) equal to \overline{X} | |
| 82. | The technique used when the processor i a) DMA | by the processor to a s not currently using t b) Bus arbitration | allow bus access to he bus is called. c) Pipelining | o any requesting device d) Bus segmentation | |
| 83. | ORG, END, DS are a) variable names c) assembler names | | b) Pseudo instru d) keywords of 8 | ctions 085 | |

| 84. | In 8051, the stack p retrieving the data a) incremented by 1, b) decremented by 2, c)incremented by 2, d) decremented by 1 | bointer is bef decremented by 1 , incremented by 2 decremented by 2 , incremented by 1 | ore the data is stored | l and white |
|-----|---|---|--|---|
| 85. | In memory mapping a) \overline{CS} | , the unused address 1 b) $\overline{C}\overline{E}$ | ines are connected to c) R/\overline{W} | d) either a) or b) |
| 86. | RIM and SIM deals v a) masking of interru c) serial data commu | vith ipts nication | b) pending of interru d) all the above | pts |
| 87. | In 8096, Global intern a) PSW. 9 | rupt control bit is b) PSW .1 | c) PSW .3 | d) PSW .6 |
| 88. | The following is a ha a) MOV A,B | rdware command to t b) ORG | he processor c) DCR M | d) SUB |
| 89. | What is the maximum value of a load which consume 500 K whr per day at a loa factor of 0.40, if the consumer increases the load factor of 0.50 without increasing the maximum demand? | | | hr per day at a load thout increasing the |
| 90. | A 100 km long trans the load is 150 MVA a) 8.06 ohms per pha c) 0.0806 ohms per p | mission line is loaded The resistance of the se hase | at 110KV. If the loss line is b) 0.806 ohms per ph d) 80.6 ohms per pha | at line is 5MW and ase ise |
| 91. | A single phase trans 500A at 300V. The se | smission line of imperending end power fact | dance j0.80hm supplie or is | es a resisive load of |
| | a) unity | b) 0.8 lagging | c) 0.8 leading | d) 0.6 lagging |
| 92. | A medium line with parameters A, B, C, D extended by connecting a short line of impedance Z in series. The overall ABCD parameters of the series combination will be | | | |
| | a) A, AZ, C + D/Z, I c) A+BZ, B, B, C + D. |) Z, D | b) A, AZ + B, C, CZ+ d) AZ, B, C/Z, D | D |
| 93. | In a string of suspen of a string could be r a) forms capacitance b) forms capacitance c) increases the capci d) none of the above | sion insulators, the volution nade uniform by the u with link pins to carry which help to cancel t tances | Itage distribution acrosses of a grading ring, be the charging current f he charging current fro | ss the different units ecause it from link pins om link pins |
| 94. | A single phase over 2m between centre. which corona will co a) 55KV | head line has two con If the dielectric streng mmence of the line, w b) 100.9 KV | nductors of diameter 2 th of air is 21 kv / cm ill be c) 110KV | 2 cm with a spacing , the lien voltage for d) 11.8KV |

| 95. | The insulation lever of 400 KV EHV over head transmission line is decided basis of. | | | sion line is decided on the | |
|------|---|--------------------------|--------------------|-----------------------------|--|
| | a) lightning over volt | age | b) switching o | ver voltage | |
| | c) corona inception v | oltage | d) radio & TV | interference | |
| | / 1 | 0 | , | | |
| 96. | Bundled conductors | are employed to | | | |
| | a) reduce the s/c curi | rent | b) improve sys | stem stability | |
| | c) decrease system sta | ability | d) none of the | above | |
| | , 5 | 5 | , | | |
| 97. | The X:R ratio of 220K | V line as compared to | 400 KV line is | | |
| | a) greater | b) smaller | c) equal | d) could be anything | |
| | | | | | |
| 98. | If δ is the loss angle o | f the cable, its power f | actor is | | |
| | a) sinδ | b) cos δ | c) tan δ | d) independent of δ | |
| | | | | | |
| 99. | If X is the system read when, | ctance and R is its resi | stance, the pow | er transferred is maximum | |
| | a) $X = R$ | b) $X = \sqrt{2}R$ | c) $X = \sqrt{3}R$ | d) $X = 2R$ | |
| | | | | | |
| 100. | 0. The following sequence currents were recorded in a power system under a f | | | wer system under a fault | |
| | $I_{\text{positive}} = i 1.653 \text{ pu}$ | | | | |
| | $I_{\text{pegative}} = -i 0.5 \text{ pu}$ | | | | |
| | $I_{zero} = -i 1.153$ pu, then the fault is | | | | |
| |) I, | | | | |
| | a) L – G fault | b) 3 ø fault | c) L-L-G fault | d) L-L fault | |
| | / | / / | , | / | |

Electronics (Section code 04)

1. Find the work done by a constant force $\overline{F} = 2\hat{i} + 4\hat{j}$, if its point of application to a block moves from A(1,1) to B(4,6)

2. If $u(x, y) = x^3 - 3xy^2 - 5y$, then its harmonic conjugate function is

a)
$$3x^2y - y^3 + c$$

c) $3x^2y - y^2 - 5x + c$
b) $3x^2y - y^3 + 5x + c$
d) $3xy^2 - y^3 + 5x + c$

3. The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where \ D \equiv \frac{d}{dx}\right)$ is a) $\frac{1}{30}(\cos 3x - \sin 3x)$ b) $\frac{1}{30}(2\cos 3x + \sin 3x)$

c)
$$\frac{1}{30}(2\cos 3x - \sin 3x)$$
 d) $\frac{1}{30}(\cos 3x - \sin 3x)$

4. The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is

a) 2.6875 b) 2.3232 c) 2.7998 d) 2.1001

5. if
$$\overline{F} = (3x^2 - 3yz)\hat{\imath} + (3y^2 - 3zx)\hat{\jmath} + (3z^2 - 3xy)\hat{k}$$
, then div \overline{F} is
a) $6(x+y+z)$ b) $6(x-y-z)$ c) $3(x+y+z)$ d) $2(x+y+z)$

6. If X is a poisson variate such that
$$P(X=1)=\frac{3}{10}$$
 and $P(X=2)=\frac{1}{5}$, find λ
a) $\frac{3}{4}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{1}{4}$
7. If $A+B=\begin{pmatrix} 1 & -1\\ 0 & -3 \end{pmatrix}$ and $A-B\begin{pmatrix} 3 & 1\\ 1 & 4 \end{pmatrix}$, then the product AB is
a) $\begin{pmatrix} -1 & -1\\ 0 & -3 \end{pmatrix}$ b) $\begin{pmatrix} 0 & -1\\ -1 & -3 \end{pmatrix}$ c) $\begin{pmatrix} 0 & -6\\ -2 & -2 \end{pmatrix}$ d) $\begin{pmatrix} -2 & -2\\ 0 & -6 \end{pmatrix}$
8. The value of $\int_{0}^{\frac{\pi}{2}} \cos^{6}x \, dx$ is
a) $\frac{3\pi}{32}$ b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$ d) $\frac{\pi}{32}$
9. Find the points at which the function $f(z) = \frac{z}{z^{2}-1}$ is not analytic.
a) $z = \pm 1$ b) $z = \pm 2$ c) $z = 1$ d) $z = -1$
10. If $x = a (\cos t + t \sin t), y = a (\sin t - t \cos t), find $\frac{dy}{dx}$$

| 11. | A network has 7 no network is | des and 5 independe | nt loops. The number | of branches in the |
|-----|---|--|---|---|
| | a) 13 | b) 12 | c)11 | d) 10 |
| 12. | Twelve 1 Ohm resistance are used as edges to form a cube. The resistance between two diagonally opposite corners of the cube is | | | resistance between |
| | a) (5/6) Ω | b)1 Ω | c) (6/5) Ω | d) (3/2) Ω |
| 13. | Two 2H inductance of each other, the coe combination can be | coils are connected in s efficient of coupling | series and are also mag being 0.1. The total | netically coupled to inductance of the |
| | a) 0.4H | b) 3.2H | c) 4.0H | d) 4.4 H |
| 14. | Superposition theore a) Non linear elemen c) Dependent current | m is NOT applicable t ts t sources | o networks containing b) Dependent voltage d) Transformer | e sources |
| 15. | The time constant of | the network shown in | figure is | |
| | | ~_~~ | | |
| | | -10V 2R≸ | ≟ c | |
| | a) 2RC | b) 3RC | c)RC/2 | d)2 RC/3 |
| 16. | A major advantage o a) op-amps | f active filters is that th b) inductors | ney can be realized wit c) resistors | hout using d) capacitors |
| 17. | Two impedance are impedances and one between the voltage a | connected in series. The across the combination the combination of the two impedations across the two impedation of two impe | he 3 voltmeters, one co tion, read equal valu nce is | nnected across each e. The phase angle |
| | a) 30 ⁰ | b) 60 ⁰ | c) 90 ⁰ | d)120 ⁰ |
| 18. | A Cut set has a) always 2 or more tree branches c) only one tree link | | b) only one tree brand d) None of the above | ch |
| 19. | When Q factor of the circuit is high then a) power factor of the circuit is high c) Bandwidth is large | | b) Impedance of the circuit is high d) None of these | |
| 20. | Which of the follow energy? | ring theorem is a ma | nifestation of the law | of conservation of |
| | a) Tellegen's Theorer c) Thevenin's Theore | n m | b) Reciprocity Theored d) Norton's Theorem | em |
| 21. | For an RC driver-point and impedance for the poles and zeros a) should alternate on the real axis b) should alternate only on the negative real axis c) should alternate on the imaginary axis | | | |

| 22. | For a transfer functiona) The degree of P(b) The degree of P(c) The degree of P(d) The maximum d | on H(s) = P(s) / Q(s) with s) is always greater tha s) and Q(s) are the sam s) is independent of the egree of P(s) and Q(s) of | here P(s) and Q(s) are n degree of Q(s) e e degree of Q(s) differ at the most by or | polynomials in s ne |
|-----|---|--|---|------------------------|
| 23. | Any semiconductor a) 4 | material has a valence b)6 | of electrons c) 8 | d) 3 or 5 |
| 24. | The largest current f a) in the emitter c) in the collector | low of a bipolar transis | stor occurs b) in the base d) through the collec | tor base |
| 25. | Which amplifier wil a) Darlington's pair c) Cascode amplifer | l be preferred for highe | est gain b) Cascade amplifier d) None of the above | |
| 26. | All of the following a) paper | are insulators except b) paraffin oil | c) Tungsten | d) Glass |
| 27. | As compared to a C a) lower current amp c) lower input resist | B amplifier, a CE ampli plification ance | fier has b) higher current am d) higher input resist | plification ance |
| 28. | Linear MOS IC's a) Cannot use MOS load resistors b) are not possible c) are difficult to fabricate d) can be designed to use direct connection between stages | | | |
| 29. | Q point in circuit sh a)3V, 2mA | b) 3V, 1mA | c) 6V, 2mA | d)6V, 1mA |
| 30. | Value of σ_i for Si a) 1.4 X 10 ⁻³ / Ω cm | b) 4.4 X10-4 /Ωcm | c) 6.4 X10-4 /Ωcm | d) None |
| 31. | Regulated output vo $Z_1, Z_2 = 200 \text{mA}, 15 \text{V}$ | b) 20V | $R_{L} \ge Eo$ | d)40V |
| | uj 10 v | 0 j 20 v | C) 50 V | u) 10 V |

M.Tech



33. Voltage gain of single stage amplifier if $Rc=2K\Omega$, $Ri=1K\Omega$, current gain=50

34. Voltage gain in an inverting amplifier with $R_1=1K\Omega$, $R_f=2M\Omega$

| a)1000 | b)1500 | c)2000 | d)2500 |
|--------|--------|--------|--------|
| / | / | / | / |

- 35. An amplifier with resistive negative feedback has two left half plane poles in its open-loop transfer function. The amplifier
 - a) will always be unstable at high frequencies
 - b) will be stable for all frequencies
 - c) may be unstable, depending on the feedback factor
 - d) will oscillate at low frequencies
- 36. Generally, the gain of a transistor amplifier falls at high frequencies due to thea) internal capacitances of the deviceb) coupling capacitor at the inputc) skin effectd) coupling capacitor at the output
- 37. A bipolar transistor is operating in the active region with a collector current of 1 mA. Assuming that β of the transistor is 100 and thermal voltage (V_T) is 25 mV, the transconductance (g_m) and the input resistance (r_{π}) of the transistor in the common emitter configuration, are

| a) $g_m = 25 \text{ mA/V}$ and $r_\pi = 15.625 \text{ k}\Omega$ | b) $g_m = 40 \text{ mA/V}$ and $r_\pi = 4.0 \text{ k}\Omega$ |
|---|--|
| c) $g_m = 25 \text{ mA/V}$ and $r_\pi = 2.5 \text{ k}\Omega$ | d) g_m = 40 mA/V and r_π = 2.5 k Ω |

38. The drain current of a MOSFET in saturation is given by $I_D = K(V_{GS} - V_T)^2$ where K is a constant. The magnitude of the transconductance g_m is

a)
$$\frac{K(V_{GS} - V_T)^2}{V_{DS}}$$

b) $2K(V_{GS} - V_T)$
c) $\frac{I_d}{V_{GS} - V_{DS}}$
d) $\frac{K(V_{GS} - V_T)^2}{V_{GS}}$

39. If op-amp in the figure is ideal, then output voltage V_{out} will be equal to



40. In the amplifier circuit shown in the figure the values of R_1 and R_2 are such that the transistor is operating at V_{CE} = 3V and I_C = 1.5 mA when its β is 150. For a transistor with β of 200, the operating point (V_{CE} , I_C) is



a) 1 V

| a) (2 V, 2 mA) | b) (3 V, 2 mA) | c) (4 V, 2 mA) | d) (4 V, 1 mA) |
|----------------|----------------|----------------|----------------|
|----------------|----------------|----------------|----------------|

- 41. An n-channel JFET having a pinch-off voltage (V_P) of -5V shows a transconductance (g_m) of 1 mA/V, when applied gate-to-source voltage (V_{GS}) is -3V. Its maximum transconductance (in mA/V) will be a) 1.5 b) 2.0 c) 2.5 d) 3.0
- 42. If for an FET, $g_m = 95 \text{ mA/volt}$, total capacitance = 500 pF, then for a voltage gain of 30, bandwidth will be a) 100 kHz b) 633kHz c) 3 MHz d) 19 MHz
- 43. A signal may have frequency components which lie in the range of 0.001 Hz to 10 Hz. Which of the following types of coupling should be chosen in a multistage amplifier designed to amplify this signal?
 a) RC coupling b) Transformer coupling
 c) Direct coupling d) Double-tuned coupling

| 44. | Op-amp used as | a tuned amplifier has | the tuned circuit con | nected |
|--|---|---------------------------|-----------------------------|------------------------|
| | a) across input | | b) across series | impedance at the input |
| | c) across feedba | ck impedance | d) across outpu | ıt |
| 45. | The bandwidth | of an RF tuned amplifi | er is dependent on Q | -factor of the |
| | a) tuned output | circuit | | |
| | b) tuned input c | ircuit | | |
| | c) operating poin | nt | | |
| | d)output and in | put circuits as well as o | quiescent operating p | oint |
| 46. If for an FET, $g_m = 95 \text{ mA/volt}$, total capacitance = 500 pF, then for a vol 30 bandwidth will be | | | hen for a voltage gain of - | |
| | a) 100 kHz | b) 633 kHz | c) 3 MHz | d) 19 MHz |
| 47. 2's complement representation of a 16-bit number (one signification of a significatio | | gn bit and 15 magnitude | | |
| | a) 0 | b) 1 | c) 32,767 | d)65,535 |
| 48. | The output of a logic gate is '1' when all its inputs are at logic '0'. Then gate is either | | | |
| | a) a NAND or a | n EX-OR gate | b) a NOR or an | EX-NOR gate |

| , | 0 | , | 0 |
|-----------------------|------|-----------------------|------|
| c) an OR or an EX-NOR | gate | d) an AND or an EX-OR | gate |

49. Choose the correct one from among the alternates A,B,C,D after matching an item from Group 1 with the most appropriate item in Group 2.

| Group 1 | Group 2 |
|--------------------|--|
| P : Shift Register | 1 : Frequency Division |
| Q : Counter | 2 : Addressing in Memory Chips |
| R : Decoder | 3 : Serial to parallel data conversion |

| | Р | Q | R |
|----|---|---|---|
| a) | 3 | 2 | 1 |
| b) | 3 | 1 | 2 |
| c) | 2 | 1 | 3 |
| d) | 1 | 2 | 3 |

50. The Boolean expression for the output for the logic circuit shown in figure is



| a) $\overline{Y} = \overline{A} B + A B + \overline{C}$ | \overline{b}) \overline{Y} = A B + \overline{A} B + C |
|---|--|
| c) $\overline{Y} = A B + \overline{A} B + C$ | \overline{d} Y = A B + A B + C |
| 51. | 1. Which of the following is equivalent to AND-OR realization? | | | | | |
|---|---|--|----------------------|------------------------------|--|--|
| | a) NAND-NC | OR realization | b) NOR – NOR : | b) NOR – NOR realization | | |
| | c) NOR – NAND realization | | d) NAND – NA | ND realization | | |
| 52. | Flash ADC is | | | | | |
| | a) a serial AD | C | b) a parallel AD | С | | |
| | c) partly seria | l and partly parallel ADC | d) successive ap | proximation ADC | | |
| 53. The number of hardware interrupts (which require an extern present in an 8085 microprocessor are | | | | ernal signal to interrupt) | | |
| | a) 1 | b) 4 | c)5 | d)13 | | |
| 54. | The contents of Register b) and Accumulator a) of 8085 microprocessor are 49H and 3AH respectively. The contents of A and the states of carry flag (CY) and sign flag (S) after executing SUB B instruction are a) A=F1, CY=1, S=1 b) A=0F, CY=1, S=1 | | | | | |
| | с) А-го, Ст- | 0, 5-0 | u) A-IF, CI-I, | 5-1 | | |
| 55. In a microprocessor, the service routine for a certain interrupt starts for location of memory which can not be externally set, but the interrupt can or rejected. Such an interrupt is | | | | | | |
| | a) non-maskable and non-vectored | | b) maskable and | b) maskable and non-vectored | | |
| | c) non-maskable and a vectored | | d) maskable and | d) maskable and vectored | | |
| 56. | The contents execution of t | of the accumulator in a he instruction | n 8085 microproces | ssor is altered after the | | |
| | a) CMP C | b) CPI 3A | c) ANI 5C | d) ORA A | | |
| 57. | An Intel 8085 | microprocessor is executir MVI A, 10H MVI B, 10H | ng the program giver | ı below | | |
| | BACK : | NOP ADD B RLC JNC BACK HLT. | | | | |
| | The number of times that the operation NOP will be executed is equal to | | | | | |
| | a)1 | b)2 | c)3 | d) 4 | | |
| 58. | In an 8085 microprocessor, after the execution of XRA A instruction a) The carry flag is set b) The accumulator contain FFH c) The zero flag is set d) The accumulator contents are shifted left by one bit | | | | | |

| 59. | The channel capacity is exactly equal to a) BW of demand c) Noise ratio in the channel | b) Amount of information per second d) None of these | | | |
|-----|--|---|-----------|--|--|
| 60. | Redundancy in communication systema) Reduces efficiency of communicationb) Helps to detect errorsc) Helps to correct errorsd) All of these | | | | |
| 61. | The Fourier series of a odd periodic func a) odd harmonics b) cosine term | tion, contains only c) even harmonics d) | sine term | | |
| 62. | Convolution of $x(t+5)$ with impulse function $a(t-12)$ $b(x(t+12))$ | tion δ (t-7) is equal to c) x(t-2) d) | x(t+2) | | |
| 63. | A band-limited signal is sampled at the Nyquist rate. The signal can be recompassing the sample througha)An RC filterb) An envelope detectorc) A PLLd)An ideal LPF with the appropriate | | | | |
| 64. | If x(t) is the linear input to a linear network whose impulse response h(t) is known then assuming that the impulse applied at $t=\lambda$ the output response y(t) will be (* convolution) a) y(t)=x * h(t) b) y(t)=x(t-\lambda)* h(t) c) y(t)=x(\lambda) * h(t-\lambda) d) y(t)=x(t+\lambda) * h(t-\lambda) | | | | |
| 65. | Consider the following statements regarding a discrete system with the output input relationship y(n)=x(n)+3. The system 1) is linear 2) is causal 3) has bonded for bonded input 4) is non-realizable Of these statements a) 1,2 and 3 are correct b) 2 and 3 are correct c) 1 and 2 are correctb) 2 and 3 are correct d) 1, 3 and 4 are correct | | | | |
| 66. | The Laplace Transform method enables one to find the response of a network in a) The transient state only b) The steady state only c) Both transient and steady states d) The transient state provided sinusoidal forcing function do not exist | | | | |
| 67. | Match List -I (characteristics of $f(t)$) with List -II (Function) and select the correct answer using the codes given below the lists: List - I A. $f(t) [1 - \{u(t)\}] = 0$ B. $f(t) + k [df(t) / dt] = 0$; k is a positive constant C. $f(t) + k [d^2 f(t) / dt^2] = 0$; k is a positive constant D. $f(t) [g(t) - f(0)] = 0$ for any arbitrary $g(t)$ | | | | |

List – II

- 1. Decaying exponential
- 2. Growing exponential
- 3. Impulse
- 4. Causal
- 5. Sinusoid
 - Code:

a)

| | А | В | С | D |
|----|---|---|---|---|
| a) | 4 | 1 | 5 | 3 |
| b) | 1 | 4 | 5 | 3 |
| c) | 1 | 2 | 5 | 3 |
| d) | 2 | 5 | 4 | 1 |

68.Which one of the following system is non linear? [y(t) = output; x(t)=input]a) y(t) = 2x(t-1)-3x(t-2)+x(t-3)b) y(t) = 5x(t)c) y(t) = 2x(t-1)-x(t-2)-x(t-4)d) y(t)=2x(t)+3.6

| 69. | The signal $x(t)=A \cos(w_0 t + \phi)$ is | |
|-----|---|-------------------------------------|
| | a) An energy signal | b) A power signal |
| | c) An energy as well as a power signal | d)Neither energy not a power signal |

70.The impulse response of a system is $h(t) = \delta(t-0.5)$. If two such system are cascaded,
the impulse response of the overall system will be
a) $0.5\delta(t-0.25)$ b) $\delta(t-0.25)$ c) $\delta(t-1)$ d) $0.5\delta(t-1)$

71. The phase margin of a system with the open-loop transfer function

$$G(s)H(s) = \frac{(1-s)}{(1+s)(2+s)} is$$

0° b) 63.4° c) 90° d) ∞

72.A system has poles at 0.01 Hz, 1 Hz and 80 Hz; zeros at 5 Hz, 100 Hz and 200 Hz. The
approximate phase of the system response at 20 Hz is
a) -90°b) 0°c) 90°d) -180°

73. A ramp input applied to a unity feedback system results in 5% steady state error. The type number and zero frequency gain of the system are respectively

a) 1 and 20 b) 0 and 20 c) 0 and
$$\frac{1}{20}$$
 d) 1 and $\frac{1}{20}$

74. If the closed-loop transfer function of a control system is given as

T (s) =
$$\frac{s-5}{(s+2)(s+3)}$$
 then it is
a) an unstable system
b) an uncontrollable system
c) a minimum phase system
d) a non-minimum phase system

- 75. The transfer function of a linear system is
 - a) ratio of the output, $v_0(t)$, and input $v_i(t)$
 - b) ratio of the derivatives of the output and the input
 - c) ratio of the Laplace transform of the output and that of the input with all initial conditions zeros
 - d) none of these
- 76. The Nyquist plot of a loop transfer function G ($j\omega$) H ($j\omega$) system encloses the (-1, j0) point. The gain margin of the system is a) less than zero b) zero c) greater than zero d) infinity
- 77. A system has a complex conjugate root pair of multiplicity two or more in its characteristics equation. The impulse response of the system will be
 - a) a sinusoidal oscillation which decays exponentially; the system is therefore stable
 - b) a sinusoidal oscillation with time multiplier; the system is therefore unstable
 - c) a sinusoidal oscillation which rises exponentially with time; the system is therefore unstable
 - d) a dc term and harmonic oscillation; the system therefore becomes limitingly stable
- 78. For making an unstable system stable

80.

- a) gain of the system should be increased
- b) gain of the system should be decreased
- c) number of zero to the loop transfer functions should be increased

d) number of poles to the loop transfer function should be increased

79. The characteristic equation of a feedback system is $s^3 + Ks^2 + 5s +10 = 0$, For the system to be critically stable, the value of K should be

a) 1 b) 2 c) 3 d) 4

| The frequency range for satellite c | communication is |
|-------------------------------------|---------------------|
| a) 1 kHz to 100 kHz | b) 100 kHz to 10kHz |
| c) 10 MHz to 30 MHz | d) 1 GHz to 30 GHz |

- 81. The input to a coherent detector is DSB-SC signal plus noise. The noise at the detector output is
 a) the in-phase component
 b) the quadrature- component
 c) zero
 d) the envelope
- 82. A Hilbert transformer is a
 a) non-linear system
 b) non-causal system
 c) time-varying system
 d) low-pass system

| 83. | Four message band limited to ω , ω , 2ω and 3ω respectively are to be multiplexed using Time Division Multiplexing (TDM). The minimum bandwidth required for transmission of this TDM signal is | | | | |
|-----|---|---|--|--|--|
| | a) ω | b) 3ω | c) 6ω | d) 7ω | |
| 84. | The probability of d narrow band noise f | ensity function of the follows which of the fo | e envelope of a sinusc ollowing distribution? | d) Poisson | |
| | u) Guussian | b) hayleigh | c) Relati | a) i 0135011 | |
| 85. | . The autocorrelation function of white noise is | | | | |
| | a) a delta function | | b) a constant | | |
| | c) Gaussian | | d) exp $(- t)$ with | usual notation | |
| 86. | In the generation of | modulated signal, a v | aractor diode can be u | used for | |
| | a) FM generation on | ly | b) AM generation of | only | |
| | c) PM generation on | ly | d) both b) and c) | | |
| 87. | A 60 Hz carrier is an of upper side bands | nplitude modulated b will be | by speech band of 300 | to 3000 Hz. The range | |
| | a) 60.3 to 63 kHz | b) 60 to 59.7kHz | c) 57 to 59.7kHz | d) 56.7 to 56.3 kHz | |
| 88. | If transmission band | lwidth is doubled in F | M, then SNR is | | |
| | a) also doubled | | b) improved four f | old | |
| | c) decreased by one | fourth | d) unaffected | | |
| 89. | In a FM demodulate | or | | | |
| | a) capacitors are cha | rged to the amplitude | e of FM wave | | |
| | b) frequency deviati | ons are converted into | o voltage | | |
| | c) simple diode as e | mployed | | | |
| | d) none of these | | | | |
| 90. | The signal to quanti | zation noise ratio in a | PCM system depends | s upon | |
| | a) sampling rate | | b) number of quan | tization levels | |
| | c) message signal ba | ndwidth | d) none of these | | |
| 91. | A TDM link has 20 s | signal channels and ea | ach channel is sample | d 8000 times/sec. each | |
| | sample is represen | ted by seven binary | v bits and contains | an additional bit for | |
| | synchronization. Th | e total bit rate for the | TDM link is | | |
| | a) 1180 M bits/sec | | b) 1280 K bits/sec | | |
| | c) 1180 M bits/sec | | d) 1280 M bits/sec | | |
| 92. | The electric field on | x-axis due to a line ch | arge extending from | $-\infty$ to ∞ is | |
| | a) $\frac{ ho_l}{2\pi arepsilon_o ho}$ | b) $\frac{\rho_l}{2\varepsilon_o\rho}$ | c) $\frac{\rho_l}{2\rho}$ | d) $\frac{\rho_l}{\varepsilon_o \rho}$ | |

| 93. | Potential at all the points on the surface of a conductor is | | | | | | | |
|------|---|------------------------------|----------------------------|-----------------------------------|--|--|--|--|
| | a) the same | b) no the same | c) zero | d) infinity | | | | |
| 94. | Gauss's law in poir | Gauss's law in point form is | | | | | | |
| | a) ∇ .D = ρ_{ν} | b) ∇ .D = ρ_s | c) ∇ .D = Q | d) ∇ D = ρ_v | | | | |
| 95. | The direction of pr | opagation of EM wav | e is obtained from | | | | | |
| | a) E×H | b) E.H | c) E | d) H | | | | |
| 96. | Electric flux densit | y is | | | | | | |
| | a) $\frac{Q}{4\pi \in_0 r^2}$ | b) $\frac{Q}{4\pi r^2}$ | c) $\frac{Q}{4\pi r^2}a_r$ | d) $\frac{Q}{4\pi \in_0 r^2} a_r$ | | | | |
| 97. | Electric flux lines a) originate at (+)ve charge b) originate at (-)ve charge c) are closed loops d) originate at ((+)ve charge and also terminate are (+)ve charge | | | | | | | |
| 98. | $\oint (\nabla \times H).S \text{ is}$ | | | | | | | |
| | a) zero | b) I _{enc} | c) J | d)∮ H.dS | | | | |
| 99. | $\nabla \times A$ is | | | | | | | |
| | a) H | b) B | c) J | d) 0 | | | | |
| 100. | ∮ B.dS is | | | | | | | |
| | a) zero | b) Q | c) H | d) J | | | | |

Instrumentation (Section code 05)

1. Find the work done by a constant force $\overline{F} = 2\hat{i} + 4\hat{j}$, if its point of application to a block moves from A(1,1) to B(4,6)

2. If
$$u(x, y) = x^3 - 3xy^2 - 5y$$
, then its harmonic conjugate function is

a)
$$3x^2y - y^3 + c$$

c) $3x^2y - y^2 - 5x + c$
b) $3x^2y - y^3 + 5x + c$
d) $3xy^2 - y^3 + 5x + c$

3. The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where \ D \equiv \frac{d}{dx}\right)$ is a) $\frac{1}{30}(\cos 3x - \sin 3x)$ b) $\frac{1}{30}(2\cos 3x + \sin 3x)$ c) $\frac{1}{30}(2\cos 3x - \sin 3x)$ d) $\frac{1}{30}(\cos 3x - \sin 3x)$

4. The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is

a) 2.6875 b) 2.3232 c) 2.7998 d) 2.1001

5. if
$$\overline{F} = (3x^2 - 3yz)\hat{\imath} + (3y^2 - 3zx)\hat{\jmath} + (3z^2 - 3xy)\hat{k}$$
, then div \overline{F} is
a) $6(x+y+z)$ b) $6(x-y-z)$ c) $3(x+y+z)$ d) $2(x+y+z)$

6. If X is a poisson variate such that
$$P(X=1)=\frac{3}{10}$$
 and $P(X=2)=\frac{1}{5}$, find λ

a)
$$\frac{3}{4}$$
 b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{1}{4}$

7. If
$$A+B=\begin{pmatrix} 1 & -1 \\ 0 & -3 \end{pmatrix}$$
 and $A-B\begin{pmatrix} 3 & 1 \\ 1 & 4 \end{pmatrix}$, then the product AB is
a) $\begin{pmatrix} -1 & -1 \\ 0 & -3 \end{pmatrix}$ b) $\begin{pmatrix} 0 & -1 \\ -1 & -3 \end{pmatrix}$ c) $\begin{pmatrix} 0 & -6 \\ -2 & -2 \end{pmatrix}$ d) $\begin{pmatrix} -2 & -2 \\ 0 & -6 \end{pmatrix}$

8. The value of
$$\int_0^{\frac{\pi}{2}} \cos^6 x \, dx$$
 is

a)
$$\frac{3\pi}{32}$$
 b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$ d) $\frac{\pi}{32}$

9. Find the points at which the function $f(z) = \frac{z}{z^2 - 1}$ is not analytic.

a)
$$z = \pm 1$$
 b) $z = \pm 2$ c) $z = 1$ d) $z = -1$

10. If
$$x = a (\cos t + t \sin t), y = a (\sin t - t \cos t)$$
, find $\frac{dy}{dx}$

11. The Ebers-Moll model is applicable to

a) Bipolar Junction Transistors

- b) NMOS Transistors
- c) Unipolar Junction Transistors
- d) Junction Field-Effect Transistors
- 12. For a single BJT common base amplifier,
 - a) Current gain as well as voltage gain can be greater than unity
 - b) Current gain can be greater than unity but voltage gain is always less than unity
 - c) Voltage gain can be greater than unity but current gain is always less than unity
 - d) Current gain can be less than unity but voltage gain is always greater than unity

13. A thin film resistor is to be made from a GaAs film doped n - type. The resistor is to have a value of 2 k' Ω . The resistor length is to be 200 µm and area is to be 10⁻⁶ cm². The doping efficiency is known to be 90%. The mobility of electrons is 8000 cm²/V - s. The doping needed is

| a) 8.7 x 10 ¹⁵ cm ⁻³ | b) 8.7 x 10 ²¹ cm ⁻³ |
|--|--|
| c) $4.6 \times 10^{15} \text{ cm}^{-3}$ | d) 4.6 x 10 ²¹ cm ⁻³ |

14. In a BJT amplifier, with the introduction of feedback, the input impedance is reduced, output impedance is increased, bandwidth is increased and distortion is reduced. The feedback is

| a) Voltage series | b) Current series |
|-------------------|-------------------|
| c) Voltage shunt | d) Current shunt |

15. The internal resistance of a current source used in the model of a BJT while analyzing a circuit using BJT is

| a) very high | b) very low | c) zero | d) moderate |
|--------------|-------------|---------|-------------|
|--------------|-------------|---------|-------------|

- 16. The peak inverse voltage rating of a diode in a bridge full wave rectifier is x times larger than that of a full-wave rectifier yielding the same dc output voltage, where the value of x is a) $\frac{1}{2}$ b) 1 c) $\sqrt{2}$ d) 2
- 17. A uniformly doped silicon *pn* junction has dopant profile of $N_a = N_d = 5X \ 10^{16} \text{ cm}^{-3}$. If the peak electric field in the junction at breakdown is $E = 4X10^5 \text{ V/ cm}$, the breakdown voltage of this junction is a) 35 V b) 30 V c) 25 V d) 20 V

18. The following currents are measured in a uniformly doped *npn* bipolar transistor: $I_{nE} = 1.20 \text{ mA}, I_{pE=} 0.10 \text{ mA}, I_{nC} = 1.18 \text{ mA} I_{R=} 0.20 \text{ mA}, I_G = 1\mu\text{A}, I_{pC0} = 1\mu\text{A}$ The β is a) 3.69 b) 0.44 c) 2.27 d) 8.39 19. A computer has the following negative numbers stored in binary form as shown. The wrongly stored number is

a) -37 as 1101 1011 c) -48 as 1110 1000 b) -89 as 1010 0111 d) -32 as 1110 0000

20. The output of logic circuit is HIGH whenever *A* and *B* are both HIGH as long as *C* and *D* are either both LOW or both HIGH. The logic circuit is



- 21. A 4 bit modulo-6 ripple counter uses *JK* flip-flop. If the propagation delay of each FF is 50 ns, the maximum clock frequency that can be used is equal to
 - a) 5 MHz b) 10 MHz c) 4 MHz d) 20 Mhz
- 22. Four memory chips of 16 X 4 size have their address buses connected together. This system will be of size
 - a) 64 X 4 b) 32 X 8 c) 16 X 16 d) 256 X 1
- 23. The circuit shown in the figure is



24. The initial contents of the 4-bit serial-in-parallel-out right-shift, register shown in the figure is 0 1 1 0. After three clock pulses are applied, the contents of the shift register will be



25. In the op-amp series regulator circuit of the figure, Vz = 6.2 V, $V_{BE} = 0.7$ V and $\beta = 60$. The output voltage v_o is



26. This phase shift oscillator operates at f = 80 kHz. The value of resistance R_F is





27. The LED in this circuit will be ON if *vi* is



- 28. An opamp Schmitt trigger is basically
 a) an opamp comparator with negative feedback
 b) an opamp comparator with positive feedback
 c) a triangle wave generator
 d) a pulse generator
- 29. It is desired to multiply the number 0AH by 0BH and store the result in the accumulator. The numbers are available in register B and C respectively. A part of the 8085 program for this purpose is given below :



The sequence of instruction to complete the program would be

| | a) c) | JNZ LOOP ADD B DCR C DCR C JNZ LOOP ADD B | | b) d) | ADD B JNZ LOOP DCR C ADD B DCR C JNZ LOOP | |
|-----|--|--|--|---|--|---|
| 30. | The o MVI ORA RLC | contents of accur I A, A7H A A C | mulator after tl | ne execu | ation of the following i | nstruction will be |
| | a) C | FH | b) 4FH | | c) 4EH | d) CEH |
| 31. | An 8 is A. a) 01 | 085 microproces A00H. The add FJFF H | ssor based syst ress of the las b) 1000 H | em uses st byte i | s a 4K x 8 bit RAM wh in this RAM is c) B9FF H | ose starting address d) BA00 H |
| 32. | When the RET instruction at the end of a subroutine is executed, a) The information where the stack is initialized is transferred to the stack pointer b) The memory address o the RET instruction is transferred to the program counter c) Two data bytes stored in the top two locations of the stack are transferred to the program counter d) Two data bytes stored in the top two locations of the stack are transferred to the stack pointer | | | | | erred to the stack ed to the program ack are transferred ack are transferred |
| 33. | The 8085 a) 00 | vectored address microprocesso)17H | s correspondin or is b) 0027H | g to the | software interrupt cor c) 0038H | nmand RST7 in d) 0280H |
| 34. | In 80 a) SI | 085 microprocess UB | or, CY flag ma b) INX | y be set | by the instruction c) CMA | d) ANA |
| 35. | A M: (A)1 | icroprocessor wi .024 | ith 12 address l b) 2048 | ines is c | c) 4096 | locations d) 64 |
| 36. | Perip a) To b) To c) To d) To | oherals are used o ensure the sec o expand the co o ensure the sec o scan the prog | for which of th curity of the s omputer's cap crecy of the pr gram | te follov ystem pabilitie rogram | ving es | |
| 37. | A cir a) n- b) 'b c) n+ | cuit with 'n' noc 1 independent ' independent +b independen | des and 'b' brai loop equation loop equation t loop equation | nches re n 1 vn | quires at least | |

38. R1 =?



39. $v_2 = ?$

a) 25 Ώ



 $i_{N}, R_{N} = ?$ 40.



41. A network N feeds a resistance R as shown in figure. Let the power consumed by Rbe *P*. If an identical network is added as shown in figure, the power consumed by R will be



- 42. Given the h-parameters for common emitter $h_{ie}=1000\Omega$, $h_{fe}=49$, $h_{oe}=1/40 \times 10^3$ and $h_{re}=0$, the values of h_{ib} and I/h_{ob} are given by a) 1000'Ω, 40k'Ω b) 20^Ω, 800^Ω c) 50k'Ω, 40k'Ω d) 20Ώ, 2ΜΩ
- 43. In the circuit shown below $v_s=0$ for t>0. The initial condition are v(0) = 6V and dv(0)/dt = -3000 V/s. The v(t) for t > 0 is



44. The common-base amplifier is drawn as a two-port in figure. The parameters are β =100, g_m =3 mS, and r_o = 800 Kώ. What is the h-parameter *h*21?

| | $p=100, g_m=31$ | $113, and r_0 = 000 \text{ K}\omega. W$ | | | | |
|-----|---|---|---|----------------------------|--|--|
| | • <u>+</u> | | • <u>•</u> • | | | |
| | | | | | | |
| | v_1 | $\{3.9 \text{ km}\}$ | | | | |
| | - o | | ō | | | |
| | a) 2.46 | b) 0.9 | c) 0.5 | d) 0.67 | | |
| 45. | In a photodiode | e, light is focused to fall o | on | | | |
| | a) n-region | | b) p-region | | | |
| | c) full p and n | region | d) junction reg | gion | | |
| 46. | A Bipolar junc collector curre | tion transistor has α = ent is | 0.99, $I_B = 25 \mu A$ and | I_{CBO} = 200nA. Then DC | | |
| | a) 2.475mA | b) 2.465mA | c) 2.485mA | d) 2.495mA | | |
| 47 | Silicon is prefet | rred over Ge because | | | | |
| 17. | a) Si has highe | er PIV | b) Si is found i | in abundance in nature | | |
| | c) Si is cost eff | ective | d) Si has lowe | r break down voltage | | |
| 48 | An amplifier o | f gain 10, with a gain-ba | andwidth product of | f 1 MHz and slew rate of | | |
| 101 | $0.1 \text{ V/}\mu\text{s}$ is fed with a10 KHz symmetrical square wave of ± 1 V amplitude. Its | | | | | |
| | output will be | | | | | |
| | a) ± 10 V amp | litude square wave | b) ± 2.5 V amp | litude square wave | | |
| | c) ± 10 V ampl | litude triangular wave | d) ± 2.5 V amp | olitude triangular wave | | |
| 49. | A class A transformer coupled, transistor power amplifier is required to deliver a | | | | | |
| | power output | of 10W.The maximum | power rating of the | transistor should not be | | |
| | a) 5W | b) 10W | c) 20W | d) 40W | | |
| | <i>a</i>) | 0) 1011 | c) 2011 | u) 1011 | | |
| 50. | An n-Channel | silicon (E _g =1.1eV) MOSF | ET was fabricated u | ising n+ poly-silicon gate | | |
| | and the threshold voltage was found to be 1V.Now, if the gate is change to p+ | | | | | |
| | poly-silicon , | other things remaining | g the same, the new | v threshold voltage will | | |
| | a) -0.1V | b) 0V | c) 1.0V | d) 2.1V | | |
| 51. | In silicon at T = | = 300 K if the Fermi ener | rov is 0.22 eV above | the valence band energy. | | |
| | the value of p | the value of p_0 is | | | | |
| | a) 2X 10 ¹⁵ cm ⁻³ | \$ | b) 1015 cm ⁻³ | | | |
| | c) 3X10 ¹⁵ cm ⁻³ | | d) 4X10 ⁻¹⁵ cm ⁻³ | 3 | | |
| 52. | A diode has re | everse saturation curren | t $Is = 10^{-10}$ A and n | on ideality factor ή=2. If | | |
| | diode voltage | is 0.9 V, then diode cu | rrent is | | | |
| | a) 11 mA | b) 35 mA | c) 83 mA | d) 143 mA | | |

| 53. | β of a transistor a) decreases with increase of temperature b) increases with increase of temperature c) remains same with increase of temperature d) varies depending on Gm | | | |
|-----|--|--|---|--|
| 54. | A common source J u=24 The voltage of | FET amplifier has a l | oad resistance R _L =500 |)KΩ, r_d =100KΩ and |
| | a) 30 | b) 25 | c) 20 | d) 40 |
| 55. | INTEL8031 is a) microcontroller c) USART | | b) microprocessor d) PPI | |
| 56. | The accuracy is spec instrument will be | ified as ± 0.5% of true | value .At 5% of full s | cale the error of the |
| | a) ± 0.025 % | b) ± 0.5% | c) ± 2.5% | d) ± 25 % |
| 57. | The smallest measur a) Resolution c) Either A or B | able input change is | b) Discrimination d) Threshold | |
| 58. | The steady state enconstant and spring a) 0.0025 | ror of a second order constant are double b) 0.01 | r system is 0.02. If b ed , the steady state e c) 0.02 | oth viscous friction error will become d) 0.04 |
| 59. | The damped oscillat factor is 0.0866.The | ions of a second order natural frequency o | system is 18 rad/s .Th f oscillation will be | ne value of damping |
| | a) 9rad/s | b) 14.14rad/s | c) 18rad/s | d) 36rad/s |
| 60. | The inverse transduc a) Potentiometer c) Both A and B | er is | b) LVDT d) Piezoelectric Cry | <i>r</i> stals |
| 61. | The strip chart record a) active transduce c) output transduce | der is an er er | b) inverse transduc d) Both b) and c) | er |
| 62. | A resistance potent potentiometer resis a) decreases b) increases c) increase as squar d) remains constan | iometer is a zero ord stance, its non-lineari re root of the resistan t | der instrument with ty ce | increase of load to |
| 63. | In a resistance poten a) Low value of err c) Both a) and b) | tiometer, the high valu or | e of resistance POT b) Low value of nor d) High value of se | leads to n- linearity nsitivity |

| 64. | Capacitive transducers a) are used for static measurement b) are used for static and dynamic me c) act as high pass filters d) act as notch filter | asurement | | |
|-----|--|---|--|--------------------|
| 65. | The order of displacement measured by a a) 1 pm b) 1 nm | a capacitive tran c) 1µm | ısducer is d) 1mm | |
| 66. | The Characteristic equation of a system is In order to ensure that the system be a) greater than zero and less than 10 c) less than zero and greater than 10 | s S ⁴ +6S ³ +11S ² +6 stable, k must l b) unity d) zero | S+k = 0 be | |
| 67. | Routh Hurwitz criterion gives a) roots in right half of s- plane b) roots in left half of s- plane c) roots in right half of s- plane and/o d) roots in left half of s- plane and/or | or roots on ima roots on imag | aginary axis ginary axis | |
| 68. | In a open loop system the control action a) depends on the input signal b) depends on system variables c) depends on size of the system d) is independent of the output | | | |
| 69. | The main application of transfer function a) steady behaviours of systems b) steady as well as transient behavior c) only transient behaviours of system d) neither steady nor transient behav | is in the study urs of systems ns iours of system | of | |
| 70. | At what frequency does the output of command before reaching steady stat a) 1.5 rad/s b) 3rad/s | variable oscillat e? c) 5 rad/s | te in responding to a s d) 10 rad/s | tep |
| 71. | The damping factor of a system is unity. a) over damped c) under damped | The system is b) critically d) unstable | damped | |
| 72. | A Stepper motor is a) a two phase induction motor b) a kind of rotating amplifier c) an electromagnetic transducer c position of a shaft into an electrica d) an electromechanical device whi linear) movements in response basis. | ommonly use l system ch actuates a to a train of ir | d to convert an angu train of step angular nput pulses on one to c | ılar (or one |

- 73. The bode plot of the transfer function G(s) = S is
 - a) Constant magnitude and constant phase shift angle
 - b) -20 db/decade and constant phase shift angle
 - c) 20 db/decade and phase shift of $\pi/2$
 - d) Zero magnitude and phase shift
- 74. It can be concluded that as a result of introducing D controller, the system becomesa) dampedb) under over damped

75. The effect of addition of pole and zero on phase margin and gain margin can be most conveniently seen ina) Nyquist plotb) Bode plot

b) an inverse transducer

d) Both b) and c)

| a) Nyquisi piot | b) bode plot |
|-----------------|------------------|
| c) Root locus | d) Routh Hurtwiz |

76. A Strip chart recorder isa) an active transducerc) an output transducer

77. Newton's rings are formed when an air film is enclosed between
a) two convex surfaces
b) plane and concave surfaces
c) two concave surfaces
d) plane and convex surfaces

- 78. The upper limit of frequency of continuous X- rays produced in an X –Ray tube is determined by
 - a) force with which electrons strike the target
 - b) momentum of electrons
 - c) energy of electrons
 - d) applied voltage

79. Which of the following device is used for the measurement of low pressures below atmospheric pressure

- a) Pirani gaugeb) Strain gaugec) Ionization gauged) Compound gauge
- 80. Which of the following devices can be used to give an indication for temperature changes?b) The maintenance in the second second

| a) Bourdon gauge | b) Thermistor |
|------------------|-----------------|
| c) Thermocouple | d) All of these |

- 81. Average life of a radioactive substance with half life as 50 days is
 a) 42.15 days
 b) 52.15 days
 c) 62.15 days
 d) 72.15 days

| 83. The shortest wave length of X-rays emitted from an X-ray tube depends on | | | |
|--|--|--|--|
| | a) current in the tube | b) voltage applied | to tube |
| | c) nature of the gas in tube | d) atomic number | of target |
| 84. | X-rays travel with velocity of | | |
| | a) sound waves | b) light waves | |
| | c) ultrasonic waves | d) sine wave | |
| 85. | Disintegration constant of a radioactive su a) 0.01186 per day | bstance with a half life b) 0.01286 per day | e of 50 days is |
| | c) 0.01386 per day | d) 0.01486 per day | Y |
| 86. | Which voltmeter has the least power const | umption? | |
| | a) Induction type | b) Hot wire type | |
| | c) Electrostatic type | d) Moving-iron at | traction type |
| 87. | A temperature is calibrated 150° C to 200° The maximum static error will be | ^o C the accuracy is spe | cified within ±0.25%. |
| | a) 0.25° C b) 0. 125° C | c) -0. 125° C | d) ±0. 125° C |
| 88. | Which instrument has the same calibration | n for ac and dc values? | , |
| | a) Induction type | b) Hot wire type | |
| | c) Moving coil type | d) Moving-iron ty | pe |
| 89. | Torque in indicating instrument is | | |
| | a) Deflecting torque | b) Control torque | |
| | c) Damping torque | d) Meter torque | |
| 90. | Two 200 V dc voltmeters having resistantseries. The safe voltage which can be ma) 500 Vb) 300 V | nces of 15 kΩ and 10 neasured by this com c) 200√2 V | kΩ are connected in abination will be d) 200 V |
| 91. | In case of 2 wattmeter method of three wattmeter A is 500 watts and reading power factor of the load circuit will be | phase power measure ing of wattmeter B | ement the reading of is 1000 watts. The |
| | a) 0.866 leading | b) 0.2 lagging | |
| | c) 0.2 leading | d) 0.866 lagging | |
| 92. | The audio oscillators use a) negative feedback | | |
| | b) both positive and negative feedback | | |
| | c) positive feedback | | |
| | d) no feedback | | |
| 93. | A 10 MHz CRO has | | |
| | a) 10 MHz horizontal oscillator | | |
| | b) 10 MHz sweep | | |
| | c) 10 MHz vertical oscillator | | |
| | a) 20 MHz horizontal oscillator | | |
| | | | |

| 94. | A double beam oscille a) two horizontal de c) two different pho | oscope has eflection plates osphor coatings | b) two electron gur d) two screens | IS |
|------|--|--|--|------------------------------|
| 95. | A Power factor has a) four control sprir c) one control sprin | ıgs | b) two control sprin d) no control sprin | ngs gs |
| 96. | Integral error comper a) minimizes steady c) increases steady e | nsation in a control sys v state error error | tem b) increases offset e d) has no effect on a | error steady error |
| 97. | The inherent characte a) sampled data c) intermittent data | eristics of a digital cont | roller is that it accepts b) analog data d) sampled or discr | ete data |
| 98. | For handling multip utilized a) Bode plot c) Root locus techni | ole input, multiple ou que | utput system the foll b) Nyquist plot d) State variable ap | lowing approach is proach |
| 99. | For the design of an amplifier is a) 2 | electronic PID contro b) 1 | oller the required nur | mber of operational d) 3 |
| 100. | In this system is view frequency response a) low pass filter c) unstable filter | wed as a processor of it would be a | sinusoidal input sig b) band pass filter d) stable filter | nals to generate the |

Computer Science (Section code 06)

1. Find the work done by a constant force $\overline{F} = 2\hat{i} + 4\hat{j}$, if its point of application to a block moves from A(1,1) to B(4,6)

2. If $u(x, y) = x^3 - 3xy^2 - 5y$, then its harmonic conjugate function is

a)
$$3x^2y - y^3 + c$$

b) $3x^2y - y^3 + 5x + c$
c) $3x^2y - y^2 - 5x + c$
d) $3xy^2 - y^3 + 5x + c$

3. The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where D \equiv \frac{d}{dx}\right)$ is

a)
$$\frac{1}{30}(\cos 3x - \sin 3x)$$

b) $\frac{1}{30}(2\cos 3x + \sin 3x)$
c) $\frac{1}{30}(2\cos 3x - \sin 3x)$
d) $\frac{1}{30}(\cos 3x - \sin 3x)$

4. The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is

5. if
$$F = (3x^2 - 3yz)\hat{i} + (3y^2 - 3zx)\hat{j} + (3z^2 - 3xy)\hat{k}$$
, then divF is
a) $6(x+y+z)$ b) $6(x-y-z)$ c) $3(x+y+z)$ d) $2(x+y+z)$

6. If X is a poisson variate such that
$$P(X=1)=\frac{3}{10}$$
 and $P(X=2)=\frac{1}{5}$, find λ
a) $\frac{3}{4}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{1}{4}$

7. If
$$A+B=\begin{pmatrix} 1 & -1 \\ 0 & -3 \end{pmatrix}$$
 and $A-B\begin{pmatrix} 3 & 1 \\ 1 & 4 \end{pmatrix}$, then the product AB is

$$a)\begin{pmatrix} -1 & -1 \\ 0 & -3 \end{pmatrix} \qquad b)\begin{pmatrix} 0 & -1 \\ -1 & -3 \end{pmatrix} \qquad c)\begin{pmatrix} 0 & -6 \\ -2 & -2 \end{pmatrix} \qquad d)$$

$$\begin{pmatrix} -2 & -2 \\ 0 & -6 \end{pmatrix}$$

8. The value of
$$\int_0^{\frac{\pi}{2}} \cos^6 x \, dx$$
 is

a)
$$\frac{3\pi}{32}$$
 b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$ d) $\frac{\pi}{32}$

9. Find the points at which the function $f(z) = \frac{z}{z^2 - 1}$ is not analytic.

a)
$$z = \pm 1$$
 b) $z = \pm 2$ c) $z = 1$ d) $z = -1$

10. If $x = a (\cos t + t \sin t)$, $y = a (\sin t - t \cos t)$, find $\frac{dy}{dx}$ a) cot t b) cosec t c) sec t d) tan t

| 11. | Which stack is used : a) FIFO c) FILO | in 8085? | b) LIFO d)none of the abov | е |
|-----|---|---|---|--|
| 12. | 1Address line for F a) 0020H | RST3 is? b) 0028H | c) 0018H | |
| 13. | The advantage of r a) Faster b) Many instruction c) Require a bigger d) All the above | nemory mapped I/C ns supporting memo address decoder | over I/O mapped I | /O is, |
| 14. | In 8086 microproc interrupts | essor the following l | nas the highest prior | ity among all type |
| | a) NMI | b) DIV 0 | c) TYPE 255 | d) OVER FLOW |
| 15. | Registers, which ar known as | e partially visible to | users and used to he | old conditional, are |
| | a) PC c) General purpose | register | b) Memory address d) Flags | s registers |
| 16. | One of the main computers is a) Words are usual b) Words are short c) Microprocessor d) Exactly the same | features that disti ly larger in micropro er in microprocessor does not contain I/O e as the machine cycl | nguish microproces ocessors s devices e time | ssors from micro- |
| 17. | What type of contr the bus, in order to a) Bus control c) Bus arbitration | ol pins is needed in prevent two devices | a microprocessor to from trying to use i b) Interrupts d) Status | regulate traffic on t at the same time? |
| 18. | When was the wor whom? | 'ld's first laptop com | puter introduced in | the market and by |
| | a) Hewlett-Packard c) Laplink traveling | ł 1980 g software Inc. 1982 | b) Epson, 1981 d) Tandy model-20 | 00, 1985 |
| 19. | A digital computer a) Speed | did not score over a b) Accuracy | n analog computer i c) Reliability | n terms of d) Cost |
| 20. | How many buses are a) 2 | e connected as part of t b) 3 | the 8085A microproces c) 5 | sor? d) 8 |
| 21. | The ensu conflict caused by a)Control bus c)address decoder | ares that only one two ICs writing diffe | IC is active at a tin prent data to the same b) Control instructi d) CPU | ne to avoid a bus e bus. .ons |

22. Which of the following buses is primarily used to carry signals that direct other ICs to find out what type of operation is being performed?
a)data bus
b)Control bus
c)address bus
d) address decoder bus

- 23. Which of the following are the three basic sections of a microprocessor unit?
 a) operand, register, and arithmetic/logic unit (ALU)
 b) control and timing, register, and arithmetic/logic unit (ALU)
 c) arithmetic/logic unit (ALU), memory, and input/output
 d) control and timing, register, and memory
- 24. An 8KB direct mapped write-back cache is organized as multiple blocks, each of size 32-bytes. The processor generates 32-bit addresses. The cache controller maintains the tag information for each cache block comprising of the following.

1 Valid bit 1 Modified bit as many bits as the minimum needed to identify the memory block mapped in the cache. What is the total size of memory needed at the cache controller to store metadata?

(tags) for the cache?

a)4864 bits b) 6144bits c) 6656bits d) 5376bits

25. The first machine to successfully perform a long series of arithmetic and logical operations was:

a) ENIAC b) Mark-I c) Analytic Engine d) UNIVAC-1

- 26. In Reverse Polish notation, expression A*B+C*D is written as a) AB*CD*+ b) A*BCD*+ c) AB*CD+* d) A*B*CD+
- 27. SIMD represents an organization that _____
 - a) refers to a computer system capable of processing several programs at the same time.
 - b) represents organization of single computer containing a control unit, processor unit and a memory unit.
 - c) includes many processing units under the supervision of a common control unit
 - d) none of the above.
- 28. Suppose that a bus has 16 data lines and requires 4 cycles of 250 nsecs each to transferdata. The bandwidth of this bus would be 2 egabytes/sec. If the cycle time of the buswas reduced to 125 nsecs and the number of cycles required for transfer stayed thesame what would the bandwidth of the bus?
 - a) 1 Megabyte/sec

c) 8 Megabytes/sec

b) 4 Megabytes/sec d) 2 Megabytes/sec

 29.
 (2FAOC)16is equivalent to

 a) (195 084)10
 b) (001011111010 0000 1100)2

 c) Both a) and b)
 d) None of these

| 30. | Which of the follow a) Decimal Number c) Binary number S | ving is not a weighte r system ystem | d code? b) Excess 3-cod d) None of these | |
|-----|--|--|--|--|
| 31. | If memory access ta | akes 20 ns with cache | e and 110 ns with out | t it, then the ratio (|
| | a) 93% | b) 90% | c) 88% | d) 87% |
| 32. | Von Neumann arch a) SISD | nitecture is b) SIMD | c) MIMD | d) MISD |
| 33. | In signed-magnitud (10011)2 then the re | le binary division, if esult is | the dividend is (111 | 00)2 and divisor is |
| | a) (00100)2 | b) (10100)2 | c) (11001)2 | d) (01100)2 |
| 34. | If the main memor uses associative ma | ry is of 8K bytes and apping. Then each we | the cache memory ord of cache memory | is of 2K words. It shall be |
| | a) 11 bits | b) 21 bits | c) 10 bits | d) 20 bits |
| 35. | Logic X-OR operati a) AACB | on of (4ACO)H& (B b) 0000 | 53F)H results c) FFFF | d) ABCD |
| 36. | The multiplicand implementing boot a) (812)10 | register & multip h's algorithm have (: b) (-12)10 | olier register of a 11101) & (1100). The c) (12)10 | hardware circuit result shall be d) (-812)10 |
| 37. | The maximum add database & 32 bit a | dressing capacity of ddress base is | a micro processor | which uses 16 bit |
| | a) 64 K. | b) 4 GB. | c) botha) &b). | d) None of these. |
| 38. | A Program Counte contains the numb when an instruction | r contains a number er 24. The effective n is read from the me | 825 and address par address in the relati | t of the instruction we address mode, |
| | a) 849. | b) 850. | c) 801. | d) 802. |
| 39. | The cache memory words. How many | of 1K words uses blocks can the cache | direct mapping with accommodate. | a block size of 4 |
| 40 | a) 256 words. | b) 512 words. | c) 1024 words. | d) 128 words. |
| 40. | a)4 | b) 6 | c)5 | d) 7 |
| 41. | Which of the follow | ving can prevent dea | dlocks? | |
| | a) semaphores c) system calls | | b) interrupts d)none of the above | 2 |
| 42. | To avoid the rac simultaneously ins | ce condition, the ide their critical secti | number of process on is | ses that may be |
| | a)8 | b)1 | c)16 | d)0 |

43. Interval between the time of submission and completion of the job is called a) Waiting timeb) Turnaround time

c) Throughput

- b) Turnaround tim
- d) Response time
- The term 'page traffic' describes 44. a) number of pages in memory at a given instant. b) number of papers required to be brought in at a given page request. c) the movement of pages in and out of memory. d) number of pages of executing programs loaded in memory. 45. Nested Macro calls are expanded using the a) FIFO rule b) LIFO rule c) FILO rule d) None of the above 46. Consider a program with a linked origin of 5000. Let the memory area allocated to it have the start address of 70000. Which amongst the following will be the value to be loaded in relocation register? a) 20000 b) 50000 c) 70000 d) none of the above 47. CPU burst time indicates the time, the process needs the CPU. The following are the set of processes with their respective CPU burst time (in milliseconds). Processes CPU-burst time P1 10 5 P2 5 P3 The average waiting time if the process arrived in the order: P2, P3 & P1 is a) 6 unit of time b) 5 unit of time c)4 unit of time d) 7 unit of time
- 48. Consider the situation in which the disk read/write head is currently located at track 45 (of tracks 0-255) and moving in the positive direction. Assume that the following track requests have been made in this order: 40, 67, 11, 240, 87. The order in which optimised C-SCAN would service these requests is

| a) 40,67,11,240,87 | b) 40,67,87,240,11 |
|--------------------|--------------------|
| c) 87,87,240,11,40 | d) 11,40,67,87,240 |

49. Consider the following set of jobs with their arrival times, execution time (in minutes), and deadlines.

| Job ids | Arrival time | Execution time | deadline |
|---------|--------------|----------------|----------|
| 1 | 0 | 5 | 5 |
| 2 | 1 | 15 | 25 |
| 3 | 3 | 12 | 10 |
| 4 | 7 | 25 | 50 |
| 5 | 10 | 5 | 12 |

The turn-around time for Job 3 in FCFS algorithm is

- a)5 b)20 c)50 d)19
- 50. The major data structure used during the first pass of the assembler are:
 a) LOCCTR (Location counter)
 b) OPTAB (operation code table)
 c) SYMTAB (Symbol table)
 d) all of the above
- 51. Given the reference string is 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5 and 3 and if 3 pages can be in memory at a time per processor, the no.of page faults in FIFO algorithm is
 - a) 9 b) 3 c) 10 d) 8
- 52. Which of the following loader is executed when a system is first turned on or restarted
 a) Boot loader
 b) Compile and Go loader
 c) Bootstrap loader
 d) Relating loader
- 53. Which of the following approaches do not require knowledge of the system state?

| a) deadlock detection | b) deadlock prevention. |
|-----------------------|-------------------------|
| c) deadlock avoidance | d) none of the above. |

- 54. The assembler which is used exclusively for Windows OS is
 - a) FASM b)TASM c) GoAsm d) all the above
- 55. The HLA assembler is used in following OS
 - a) Windows b) Free BSD c) Unix d) All the above
- 56. In the following tree



If the post order traversal generates the sequence xy-zw*+, the label of the nodes 1,2,3,4,5,6, and 7 are

a)+,-,*,x,y, z,w b) x,-,y,+,z,*,w c)x, y, z, w, -,*,+ d)-,x,y,+,*,w

| 57. | Following operations are performed on a stack , Push(1), Push(2), pop, push(1),Push(2), Pop,Pop,Pop, Push(2), Pop. The sequence of the popped out values are | | | |
|-----|--|---|---|--|
| | a)2,2,1,2,2 | b)2,2,1,1,2 | c)2,1,2,2,1 | d)2,1,2,2,2 |
| 58. | Average successful a) n/2 | search time of a seq b) (n+1)/2 | uential search of n ite c) (n-1)/2 | ems is d) log(n)+1 |
| 59. | Four algoritms A1, (n) nlog(n), n. Whis | A2,A3 and A4 solve h is the best algorith | e a problem with ore m | der log(n), log log |
| | a)A1 | b)A2 | c)A3 | d)A4 |
| 60. | Running time $T(n)$ follows: $T(n)=c+T(n)$ a) n^2 | where n is the inpu n-1) if n>1 and T(n)= b)n | t size od the recursiv d if n<1. The order o c)n ³ | ve algorithm is as f the algorithm is d)n ⁿ |
| 61. | Average number merging two sorted | of comparisons per d list of length 2 is | formed by merge | sort algorithm in |
| | a)8/3 | b)8/5 | c)11/3 | d)11/6 |
| 62. | The order of binary a)n | search algorithm is b)n ² | c)nlogn | d)logn |
| 63. | Which of the follo relations? | wing abstract data | types can be used f | or many to many |

| a)Tree | b)stack | c)graph | d)queue |
|--------|---------|---------|---------|
| | | | · _ |

64. In the following graph which is valid strong component?

b) 1,2,4



a)1,3,4

c)2,3,4

d)1,2,3

65. Following tree gives 1 after evaluation



The values of the variable are

| 66. | Number of leaf r a)10 | nodes in a 3-nary tree b)23 | e with 6 internal r c)17 | nodes is d)13 |
|-----|---|---|--|---|
| 67. | The first fit strate a) Uses linked lis b) Finds first bloc c) Both a&b d) None of the al | egy at for implementation ck in the free list of s pove | n ize greater than c | lesired size |
| 68. | The worst case co a)W(n)=n-1 | omplexity to find ma b)W(n)=0 | ax element in an a c)W(n)=n | nrray is d)W(n)=n/2 |
| 69. | If a numeric field a)23.10 | l has a width of 5.2, † b)121.8 | then the value of c)143.87 | field could be d)both a) & b) |
| 70. | Consider a linke element after an a) O (1) | ed list of n elemen element pointed by s b) O ()n log2 | ts. What is the some pointer? c) O (n) | time taken to insert an d) O ()n log n 2 |
| 71. | Consider the foll Student (<u>rollno</u> , r Enroll (<u>rollno</u> , <u>co</u> where the prima Student and Enro and minimum no where �*� deno | owing relation scher name, address) <u>urseno</u> , coursename ry keys are shown u oll tables are 120 and umber of tuples that otes natural join? | na pertaining to a) nderlined. The nu l 8 respectively. V can be present in | a students database: umber of tuples in the Vhat are the maximum (Student * Enroll), |
| | a)8.8 | b)120,8 | c)960,8 | d)960,120 |
| 72. | The DBMS that is a) Microsoft's SQ c) IBM's DB2 | s most difficult to us JL Server | e is b) Microsoft's d) Oracle Cor | s Access poration's Oracle |
| 73. | Which of the following products was an early implementation of the relational model developed by E.F. Codd of IBM? | | | implementation of the d)R-base |
| 74. | When the values exist in another s a(n): a)transitive depe c)referential integ | s in one or more att set of one or more at ndency grity constraint | ributes being use tributes in anothe b)insertion ar d)normal form | d as a foreign key must er table, we have created nomaly m. |
| 75. | Most of the tim should be norma | ne, modification an lized into | omalies are serie | ous enough that tables |
| | a)1 NF | b) 2NF | c)3NF | d)BCNF |

| 76. | A functional dependency is a relationsh a)tables b)rows | ip between or among: c)relations d)sttributes |
|-----|---|--|
| | If attributes A and B determine attribute C, a) $A \rightarrow B$ c) A,B) is a composite determinant | then it is also true that: b) $A \rightarrow C$ d) C is a determinant. |
| 77. | Which type of entity has its relationsh attribute in that other entity called a dis a)Supertype entity c) Archetype entity | ip to another entity determined by an criminator? b) Subtype d) Instance entity |
| 78. | Which of the following occurs when a trows that were inserted by a command a)Nonrepeatable read c)Dirty read | rransaction rereads data and finds new transaction since the prior read? b)Phantom read d)Consistent read |
| 79. | Which of the following disallows both but allows phantom reads? a) Read committed c) Repeatable read | dirty reads and nonrepeatable reads, b) Read uncommitted d) Serializable |
| 80. | Each answer below shows example day example of the inconsistent values probable a) Three columns have the values 53 same row. b) Three rows have the values Brown Small Brown Chair in the same columns. c) Three rows have the values Brown, 12 d) One row has the value "He is interent 1978-1988" in a column. | ata from a table. Which answer is an lem? 4-2435, 534-7867, and 546-2356 in the Small Chair, Small Chair Brown, and mn. NULL, and Blue in the same column. sted in a Silver Porsche from the years |
| 81. | Which is not a relevant feature of CASEa) The ability to help draw data modelb) The ability to generate codec) An information repositoryd) Access to a DB via the Internet | tools? s using entity-relationship notations |
| 82. | The transaction allowed to occur by a sl a)Delete b)Insert | nared lock is c) read d)update |
| 83. | Which of the following functions does t a) Commit or rollback transactions only b) Connect to data sources with driver-s c) Connect to data sources only d) Both 1 and 3 above are in the OBDC | he ODBC core API consist of? specific information only core API |

M.Tech

| If we need to enfor should be given to a)after system | rce resource limits : enable this enforcem b)after profile | for a specific profile ent for the instance c)after database | e, when command d)after resources | |
|--|--|---|--|--|
| Which of the follo | wing products was | the first to implement | ent true relational | |
| algebra in a PC DB a)IDBMS | MS? b)Oracle | c)dBase-II | d)R-Base | |
| How many digits | of the DNIC (Data | Network Identificati | on Code) identify | |
| a)first three c)first five | | b)first four d)none of the above | 2 | |
| The probability that a single bit will be in error on a typical public telephon line using 4800 bps modem is 10 to the power -3. If no error detection mechanism is used, the residual error rate for a communication line using 9 bit formers is approximately appeal to | | | | |
| a)0.003 c)0.991 | | b)0.009 d)none of the above | 2 | |
| You have a class A to add 60 new subi possible number of assign? | network address 10 nets very soon. You of host IDs per sub | .0.0.0 with 40 subnet would like to still al net. Which subnet | s, but are required low for the largest mask should you | |
| a)255.240.0.0 | b)255.248.0.0 | c)255.252.0. | d)255.254.0.0 | |
| What are the most | commonly used tra | nsmission speeds in | BPS used in data | |
| a)300 | b)1200 | c)2400 | d)9600 | |
| Avalanche photod | liode receivers can | detect hits of tran | nsmitted data by | |
| a)100 photons c)300 photons | | b)200 photons d) None of the abov | /e | |
| What part of 192.7 mask? | 168.10.51 is the Net | work ID, assuming | a default subnet | |
| a)192 | b)192.168.10 | c)0.0.0.5 | d)51 | |
| A noiseless 3 KHz the maximum data | Channel transmits rate? | bits with binary leve | el signals. What is | |
| a)3 kbps | b)6 kbps | c)12 kbps | d)24 kbps | |
| What can greatly re a)WINS Server | educe TCP/IP config b)WINS Proxy | uration problems? c)DHCP Server | d)PDC | |
| What is the port nu a)119 | mber for NNTP? b)79 | c)100` | d)212 | |
| | If we need to enfo should be given to a)after system Which of the follo algebra in a PC DB a)IDBMS How many digits the country? a)first three c)first five The probability that line using 4800 by mechanism is used bit frames is approx a)0.003 c)0.991 You have a class A to add 60 new subr possible number of assign? a)255.240.0.0 What are the most communication? a)300 Avalanche photod receiving a)100 photons c)300 photons c)300 photons c)300 photons c)300 photons c)300 photons c)300 photons c)300 photons What part of 192.7 mask? a)192 A noiseless 3 KHz the maximum data a)3 kbps What can greatly re a)WINS Server What is the port nu a)119 | If we need to enforce resource limits should be given to enable this enforcer a)after system b)after profile Which of the following products was algebra in a PC DBMS? a)IDBMS b)Oracle How many digits of the DNIC (Data is the country? a)first three c)first five The probability that a single bit will be line using 4800 bps modem is 10 to mechanism is used, the residual error of bit frames is approximately equal to a)0.003 c)0.991 You have a class A network address 10 to add 60 new subnets very soon. You possible number of host IDs per sub assign? a)255.240.0.0 b)255.248.0.0 What are the most commonly used tra communication? a)300 b)1200 Avalanche photodiode receivers can receiving a)100 photons c)300 photons | If we need to enforce resource limits for a specific profile should be given to enable this enforcement for the instance a) after system b) after profile c) after database which of the following products was the first to implementate algebra in a PC DBMS? a) IDBMS b) Oracle c) dBase-II How many digits of the DNIC (Data Network Identification of the country? a) first three b) first four c) first five d) none of the above of the probability that a single bit will be in error on a typical line using 4800 bps modem is 10 to the power -3. If r mechanism is used, the residual error rate for a communic bit frames is approximately equal to a) 0.003 b) 0.009 c) 0.991 d) none of the above of th | |

| 95. | Eight stations are 'Adaptive tree Wal ready at once, how a)7 slots | competing for the k Protocol'. If the s many bit slots are ne b)5 slots | use of a shared c tations 7 and 8 are eeded to resolve the c c)10 slots | hannel using the suddenly become contention? d)14 slots |
|------|---|--|--|--|
| 96. | Usually, it takes 10 be transmitted at a | -bits to represent on speed of 1200 BPS? | e character. How ma | ny characters can |
| | a)10 | b)20 | c)120 | d)1200 |
| 97. | With an IP address of 100, you currently have 80 subnets. What subnet mas should you use to maximize the number of available hosts? | | | Vhat subnet mask |
| | a)192 | b)224 | c)240 | d)252 |
| 98. | The geostationary s a) rotates with the e b) remains stationar c) is positioned ove d) All of the above | atellite used for com earth ry relative to the eart r equator | munication systems h | |
| 99. | The houses th a)Transceiver c)MAU | ne switches in token | ring. b)nine-pin connectc d)NIC | or |
| 100. | The maximum reco a) 200 metres | mmended segment l b) 100 metres | ength for UTP is c) 500 meters | d) 1000 meters |

Chemical (Section code 07)

1. Find the work done by a constant force $\overline{F} = 2\hat{i} + 4\hat{j}$, if its point of application to a block moves from A(1,1) to B(4,6)

2. If
$$u(x, y) = x^3 - 3xy^2 - 5y$$
, then its harmonic conjugate function is

a)
$$3x^2y - y^3 + c$$

b) $3x^2y - y^3 + 5x + c$

c)
$$3x^2y - y^2 - 5x + c$$

d) $3xy^2 - y^3 + 5x + c$

3. The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where D \equiv \frac{d}{dx}\right)$ is

a)
$$\frac{1}{30}(\cos 3x - \sin 3x)$$

b) $\frac{1}{30}(2\cos 3x + \sin 3x)$
c) $\frac{1}{30}(2\cos 3x - \sin 3x)$
d) $\frac{1}{30}(\cos 3x - \sin 3x)$

4. The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is a) 2.6875 b) 2.3232 c) 2.7998 d) 2.1001

5. if
$$\overline{F} = (3x^2 - 3yz)\hat{i} + (3y^2 - 3zx)\hat{j} + (3z^2 - 3xy)\hat{k}$$
, then div \overline{F} is
a) $6(x+y+z)$ b) $6(x-y-z)$ c) $3(x+y+z)$ d) $2(x+y+z)$

6. If X is a poisson variate such that
$$P(X=1)=\frac{3}{10}$$
 and $P(X=2)=\frac{1}{5}$, find λ
a) $\frac{3}{4}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{1}{4}$

7. If
$$A+B=\begin{pmatrix} 1 & -1 \\ 0 & -3 \end{pmatrix}$$
 and $A-B\begin{pmatrix} 3 & 1 \\ 1 & 4 \end{pmatrix}$, then the product AB is

a)
$$\begin{pmatrix} -1 & -1 \\ 0 & -3 \end{pmatrix}$$
 b) $\begin{pmatrix} 0 & -1 \\ -1 & -3 \end{pmatrix}$ c) $\begin{pmatrix} 0 & -6 \\ -2 & -2 \end{pmatrix}$ d) $\begin{pmatrix} -2 & -2 \\ 0 & -6 \end{pmatrix}$

8. The value of $\int_0^{\frac{\pi}{2}} \cos^6 x \, dx$ is

a)
$$\frac{3\pi}{32}$$
 b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$ d) $\frac{\pi}{32}$

9. Find the points at which the function
$$f(z) = \frac{z}{z^2 - 1}$$
 is not analytic.

a) $z = \pm 1$ b) $z = \pm 2$ c) z = 1 d) z = -1

10. If
$$x = a (\cos t + t \sin t)$$
, $y = a (\sin t - t \cos t)$, find $\frac{dy}{dx}$
a) cot t b) cosec t c) sec t d) tan t

| 11. | In case of a solution (not of a solid in a lie sum of the volumes of its components in the a) independent of temperature c) increased with rise in pressure | quid), whose total volume is less than the heir pure states, solubility isb) increased with decrease in pressured) unchanged with pressure change |
|-----|--|---|
| 12. | A solution which contains the maximum a given amount of the solute that can be diss particular temperature is called | mount of solute that can be dissolved in a olved in a given amount of the solvent at a |
| | a) Concentrated solution | b) saturated solution |
| | c) Molar solution | d) molal solution |
| 13 | If the pH of a solution is 6.2 , then pOH is e | qual to |
| | a) 14 | b) 6.2 |
| | c) 7.8 | d) 13.2 |
| 14 | Ratio which defines the recycle ratio in a ch | nemical process is |
| 11. | a) gross feed stream/recycle feed stream | b) recycle stream/fresh feed stream |
| | c) recycle stream/gross feed stream | d) fresh feed stream/recycle stream |
| 15 | In a chamical process, the recycle stream is | purged for |
| 10. | a) increasing the yield | b) enriching the product |
| | c) limiting the inerts | d) heat conservation |
| 17 | m | |
| 16. | I he major constituent in black liquor is | h) and importants |
| | c) silica | d) iron oxide |
| | -, | -, |
| 17. | The unit of molality is | |
| | a) mole/kg | b)mole/litre of solution |
| | c) g/litre of solution | d) kg/litre of solution |
| 18. | Kopp's rule is concerned with the calculati | on of |
| | a) Thermal conductivity | b) heat capacity |
| | c) Viscosity | d) surface tension |
| 19. | An ideal solution follows | |
| | a) Boyle's law | b) Amgat's law |
| | c) Raoult's law | d) Trouton's rule |
| 20. | Fuels which requires maximum amount of | 'excess air' for complete combustion is |
| | a) solid b) liquid | c) gaseous d) nuclear |
| 21 | For the laminar flow of a fluid in a circular | ning of radius P, the Hagen Poissuille |
| 21. | equation predicts the volumetric flowrate t | o be proportional to |
| | a) R b) R^2 | c) R^4 d) $R^{0.5}$ |
| | , , | , , , |
| 22. | In Hagen-Poiseuille flow through a cylindr | ical tube, the radial profile of shear stress |
| | a) constant b) cubic | c) parabolic d) linear |
| 23. | In pipe flow heat is transferred from hot w | all to the liquid by |
| | a) conduction only | b) forced convection only |
| | c) forced convection and conduction | d) free and forced convection |
| | | |

| 24. | Each term in Bernoul a) Energy per Unit m c) Pressure forces | li's Equation represent ass | s Of fluid. b) Viscous forces d) Turbulent forces | |
|-----|--|--|---|--|
| 25. | A centrifugal pump and is raised to an o 50mm. What head (n water at a flow of 0.00 a) 10 | is used to pump wate overhead tank 10m ab n of water) must the 01m ³ /s? The fanning b) 11 | er through a horizonta pove. The pipe is smo pump generate at its friction factor, f is 0.0 c) 12 | al distance of 150m ooth with an I.D. of s exit (E) to deliver 062 d) 20 |
| 26. | A pump draws oil overhead tank. The n The velocities at the s respectively. Neglect to be unity, the press | (Sp.gravity 0.8) from nechanical energy deli suction and the discha ing friction losses and ure developed by the p | n storage tank and overed by the pump to rge points of the pump assuming kinetic ener pump in kN/m ² is | discharges it to an the fluid is 50J/kg. p are 1m/s & 7m/s, rgy correction factor |
| | a) 19.2 | b) 20.8 | c) 40 | d) 80 |
| 27. | Cavitation is caused l a) high velocity c) high pressure | у | b) low barometric pre d) low pressure | essure |
| 28. | The flow of water in a a) Venturi meter c) Pitot tube | a pipe of diameter 3000 | Omm can be measured b) Rotameter d) Orifice plate | by |
| 29. | Coefficient of dischar a) more c) same | ge in comparison to co | pefficient of velocity is b) less d) not necessary | |
| 30. | Dynamic viscosity of a) increases c) remains same | most of the gases with | rise in temperature b) decreases d) unpredictable | |
| 31. | Chemical reactions in a) electrons | volve the participation b) protons | n of c) neutrons | d) nuclei |
| 30 | Processiro bas vorv litt | la affect on the rate of | reaction involving | |
| 52. | a) solids only c) gases only | le effect off the fate of f | b) liquids only d) solid and liquids b | oth |
| 33. | Reactions with low ac a) highly temperature c) always reversible | ctivation energy are e sensitive | b) temperature insens d) always irreversible | sitive |
| 34. | The minimum energy a) internal energy c) Gibb's free energy | v necessary to permit a | chemical reaction is b) entropy d) threshold energy | |
| 35. | The most suitable rea a) batch reactor c) semi-batch reactor | ctor for carrying out a | n auto-thermal reactio b) CSTR d) plug-flow reactor | n is |

| 36. | The excess energy of a) thermal energy c) threshold energy | the reactants required | l to dissociate into products is known as b) activation energy d) binding energy | |
|-----|--|--|--|--|
| 37. | What is the dispersic a) 0 | n number for a CSTR? b) 1 | c) <1 | d) ∞ |
| 38. | The rate controlling temperature is | step in a solid-gas nor | n-catalytic reaction occ | curring at very high |
| | a) pore diffusion c) ash layer diffusion | | b) film diffusion d) chemical reaction | |
| 39. | Ionic reactions occur a) solid state only c) solutions | in | b) liquid state only d) any state | |
| 40. | The exit age distribution of fluid leaving a vessel is used to study thea) reaction kineticsb) extent of non-ideal flow in the vesc) reaction mechanismd) know activation energy of a reaction | | | the l flow in the vessel nergy of a reaction |
| 41. | Energy can be converted from one form to another. This isa) zeroth law of thermodynamicsb) first law of thermodynamicsc) second law of thermodynamicsd) Fourier's law | | odynamics | |
| 42. | Multiple pass heat ex a) increase pressure o c) decrease pressure | cchanger is used to lrop drop | b) increase rate of head d) decrease vibrators | at transfer |
| 43. | Overall coefficient of a) conduction c) radiation | heat transfer is used in | n case of b) convection d) conduction and co | onvection |
| 44. | Ratio of inertial force a) Reynolds number c) Prandtl number | e to viscous force is kno | ıs force is known as b)Nusselt number d) Grashoff number | |
| 45. | The heat transfer by a) electromagnetic w c) flow of electrons | fer by radiation takes place by means of netic waves b) molecular energy interchanges crons d) flow of fluid | | |
| 46. | In pool-boiling, the highest heat transfer coefficient occurs in a) subcooled boiling zone b) nucleate boiling zone c) partial film boiling zone d) film boiling zone | | | one |
| 47. | The heat flow across but the area normal t a) volume | s the tube wall is dete to the heat flow vector b) mass | rmined from the Four changes with c) density | tier conduction law, d) radius |
| 48. | Free convection is so a) viscous forces c) frictional forces | lely due to | b) buoyant forcesd) Reynolds forces | |

| 49. | The highest value of a) solid ice | thermal conductivity i b) water | s expected for c) steam | d) supe | erheated steam |
|-----|---|---|-------------------------------------|--|-------------------------------|
| 50. | Air at 20°C blows over heat transfer coefficie | er a plate of 50 cm \times 75 ent is 25 w/m ² °C, the l | cm maintained heat transfer ra | d at 250º te is | C. If the convection |
| | a) 215.6 KVV | D) 2136 KW | C) 2.156 KVV | | u) 21.56 KW |
| 51. | Sudden bursting of a a) isothermal process c) isobaric process | cycle tube is an s | b) adiabatic p d) isochoric | process process | |
| 52. | After throttling, gas t a) decreases | emperature b) increases | c) remains sa | me | d) uncertain |
| 53. | The number of degre a) 0 | es of freedom at the tr b) 1 | iple point of wa c) 2 | ater is | d) 3 |
| 54. | The Mollier chart is a) Pressure-enthalpy c) Temperature-entro | chart ppy chart | b) Enthalpy-e d) Pressure-ve | ntropy c olume cl | hart hart |
| 55. | For a real gas the fug a) equal to one | acity coefficient is alw b) less than one | ays c) greater tha | n one | d) uncertain |
| 56. | Gibbs free energy of a) zero | mixing at constant tem b) positive | nperature and p c) negative | oressure | must always be d) infinity |
| 57. | A nozzle is a device of a) reduces kinetic end b) increases kinetic end c) increases kinetic end d) reduces kinetic end | which ergy and increases pre- nergy and decreases pr nergy as well as pressu ergy as well as pressu | ssure ressure ıre re | | |
| 58. | Critical pressure ratio a) 1 | o for the flow of satura b) >1 | ted steam thro c) <1 | ugh a co | nverging nozzle is d) >>1 |
| 59. | The principle of refri a) zeroth law of therr c) second law of ther | geration is based on nodynamics modynamics | b) first law of d) third law o | thermoo f thermo | lynamics odynamics |
| 60. | In steam jet referigera a) steam | ators, the refrigerating b) water | fluid is practic c) ice | ally alw | ays d) brine |
| 61. | Match the variation of the appropriate varia Group I (P) Film Theory (Q) Penetration T (R) Boundary lay | of mass transfer coeffi tion in Group II heory er Theory | cient given by (1) (2) (3) | the theorem the theorem of theorem of the theorem of the theorem of the theorem of the theorem of theorem of the theorem of theorem of the theorem of theorem of theorem of the theorem of theorem of theorem of theoremoon of theorem of theorem of | ory in Group I with II |
| | a) P-1, Q-2, R-3 c) P-1, Q-3, R-2 | | b) P-2, Q-1, R- d) P-3, Q-2, R- | -3 -1 | |

| 62. | If the amount of the steam used in steam distillation is increased, the tempera distillation | | | |
|-----|--|--|--|--|
| | a) increases | b) decreases | | |
| | c) remains unchanged | d) depend on relative volatility | | |
| 63. | The same diameter columns which | n give lowest pressure drop per unit height is | | |
| | a) bubble-cap column | b) sieve-plate column | | |
| | c) packed column | d) randomly packed column | | |
| 64. | At total reflux the capacity of a dis | tillation column is | | |
| | a) zero | b) maximum | | |
| | c) minimum | d) optimum | | |
| 65. | Stripping is an | | | |
| | a) isothermal process | b) exothermic process | | |
| | c) endothermic process | d) autocatalytic process | | |
| 66. | Wetted wall column experimentally determines | | | |
| | a) mass transfer coefficient | b) diffusion coefficient | | |
| | c) relative volatility | d) number of transfer units | | |
| 67. | Vapor free gas means | | | |
| | a) 0% humidity | b) 100% humidity | | |
| | c) 1% humidity | d) between 0 and 100% humidity | | |
| 68. | The dew point of saturated gas ph | ase equals to | | |
| | a) 0°C | b) 25°C | | |
| | c) gas temperature | d) bubble temperature | | |
| | | | | |
| 69. | The Hatta number plays an important role in problems of a) gas absorption without chemical reaction b) gas absorption with chemical reaction | | | |
| | c) multicomponent distillation wit d) solvent extraction | hout chemical reaction | | |
| 70 | All maisture in a non burnagaonia | materialia | | |

| 70. | All moisture in a non-hygroscopic material is | | |
|-----|---|-------------------------|--|
| | a) bound moisture | b) free moisture | |
| | c) unbound moisture | d) equilibrium moisture | |

71. Which of the systems having the following transfer function is stable? a) $\frac{1}{S^2 + 2}$ b) $\frac{1}{S^2 - 2S + 3}$

c)
$$\frac{1}{S^2 + 2S + 2}$$
 d) $\frac{e^{-20s}}{S^2 + 2S - 1}$

72. For an input function $X(t) = 2t^2$, laplace transform of this function is

a)
$$\frac{2}{S^2}$$
 b) $\frac{4}{S^2}$ c) $\frac{2}{S^3}$ d) $\frac{4}{S^3}$

| 73. | The offset for P controller is a) maximum c) zero | b) minimum d) moderate |
|-----|---|--|
| 74. | Addition of derivative control mode to t decreases a) derivative time c) offset | he proportional mode for PD controller b) integral time d) oscillation |
| 75. | The variation of controlled variable with lo known as a) servomechanism control problem b) regulator control problem c) supervisory control d) DDC | oad variable for fixed value of set point is |
| 76. | The steam temperature in the tank heater is a) controlled variable c) load variable | b) manipulated variable d) error |
| 77. | Tachometer and stroboscope are used to me a) liquid level c) moisture | easure b) speed d) composition |
| 78. | In cascade control generally the controller v a) P controller c) PD controller | used in the secondary loop is b) PI controller d) PID controller |
| 79. | The system exhibiting unbounded response a) unstable c) non-oscillatory | e to a unbounded input is b) stable d) bounded output |
| 80. | The transfer function for a PD controller is | |
| | a) $K_C (1 + \tau_D S)$ b) $K_C (1 + \frac{1}{\tau_D S})$ | c) $K_C(\tau_D S)$ d) $\frac{K_C}{\tau_D S}$ |
| 81. | Screen having maximum capacity is a) grizzlies c) shaking screen | b) trommels d) vibrating screen |
| 82. | Opening of 400 mesh screen (Taylor screen) a) 0.38 mm c) 0.0038 mm | is b) 0.038 mm d) 3.8 mm |
| 83. | A fluid energy mill is used for a) cutting b) grinding | c) ultra grinding d) crushing |
| 84. | Mesh is defined as the number of openings a) feet of screen surface c) meter of screen surface | per linear b) inch of screen surface d) centimeter of screen surface |
| 85. | The law which is applicable for fine grinding | ng, is |
|---------------------|---|---|
| | a) Kick's law | b) Rittinger's law |
| | c) Bond's law | d) Fick's law |
| | | |
| 86. | Colloidal mills are used for | |
| | a) coarse grinding | b) intermediate grinding |
| | c) fine grinding | d) ultrafine grinding |
| | | , |
| 87. | Grinding efficiency of a ball mill is of the or | rder of |
| | a) 1-5% | b) 40-50% |
| | c) 75-80% | d) 90-95% |
| | | |
| 88. | Size reduction does not occur due to compa | ression in |
| | a) rod mills | b) gyratory crushers |
| | c) jaw crushers | d) smooth crushers |
| | | , |
| 89. | As the product becomes finer, the energy re | equired for grinding |
| | a) decreases | |
| | b) increases | |
| | c) is same as for coarser grinding | |
| | d) is 1.5 times that for coarser grinding | |
| | , 0 0 | |
| 90. | Soft and non-abrasive materials can be made | le into fines by |
| | a) attrition | b) compression |
| | c) cutting | d) impact |
| | , 0 | / 1 |
| 91. | The turnover ratio is given by | |
| | gross annual sales | |
| | a) <u>fixed capital investment</u> | |
| | | |
| | b) <u>annual profit</u> | |
| | fixed cost | |
| | total production cost | |
| | fixed cost | |
| | variable cost | |
| | d) <u>fixed cost</u> | |
| | ince cost | |
| 92 | A balance sheet for an industrial concerns s | shows |
| <i>, ,</i> | a) the financial condition at any given time | |
| | b) only current assets | |
| | c) only fixed assets | |
| | d) only current and fixed assets | |
| | a) only current and fixed assets | |
| 93 | "Break even point" is the point of intersecti | ion of |
| <i>.</i> | a) fixed cost and total cost | b) total cost and sales revenue |
| | c) fixed cost and sales revenue | d) fixed cost and operating cost |
| | cj incu cost and sales revenue | a, inca cost and operating cost |
| 94 | Effective and nominal interest rates are equ | al when the interest is compounded |
| <i>/</i> 1 , | a) annually | b) fortnightly |
| | c) monthly | d) half-vearly |
| | cj monuny | uj nan-yeany |

| 95. | With increase in the discounted cash flow rate of return, the ratio of the total provalue to the initial investment of a given project | |
|------|--|---------------------|
| | a) decreases | b) increases |
| | c) increases linearly | d) remains constant |
| 96. | Most commonly used, rubber vulcanizing a | ngent is |
| | a) sulphur | b) bromine |
| | c) platinum | d) alumina |
| 97. | Glycerine can be from | |
| | a) Fat | b) naphthalene |
| | c) cumene | d) sucrose |
| 98. | Main constituent of cotton seed oil is | |
| | a) acetic acid | b) linoleic acid |
| | c) palmitic acid | d) oleic acid |
| 99. | Soda ash is produced by | |
| | a) chamber process | b) solvay process |
| | c) contact process | d) chance process |
| 100. | Main constituents of cotton fibre is | |
| | a) lignin | b) cellulose |
| | c) starch | d) gelatine |
| | / | , 0 |

| 1. | DNA duplication occ a) Mitosis only | curs in | b) Meiosis I and mito | osis |
|-----|--|---|---|--|
| | c) Melosis only | | a) Melosis II and IIIt | 0515 |
| 2. | Blast cells are:- a) Precursors of matu c) Transformed cells | ure cells | b) Cells that blast d) Enucleated cells | |
| 3. | The (OH ⁻) concentrat a) 1x10 ⁻⁸ g mol per litt c) 1x10 ⁻¹² g mol per lit | ion of 0.01N HCL solu ce tre | tion is:- b)1x10 ⁻¹⁰ g mol per lit: d)1x10 ⁻¹⁴ g mol per lit: | re |
| 4. | The sites of oxygen e a) Grana stacks c) Inner wall of chlor | volution and photoph oplast | osphorylation in chloro b) Matrix d) Surface of chlorop | oplast are:- last |
| 5. | Galactosemia is due a) Glucose-6-phosph c) Glucokinase | to the deficiency of atase | b) Phosphogalactose d) Phosphoglucomut | uridyl transferase ase |
| 6. | Which one of the fo langerhans? a) Hyperglycemia | llowing inhibits the r | release of insulin from b) Elevated levels of | n ß cells of islets of norepinephrine |
| | c) Elevated levels of a | arginine | d) Elevated levels of | Glucagon |
| 7. | Deficiency in the sect a) Sluggishness and (b) High blood pressu c) Delayed developm d) Defective carbohy | retion of hormone from Growth retardation are aent of secondary sex of drate metabolism | n the thyroid gland lea haracteristics | ds to: |
| 8. | A bacterial cell wall of a) Gives shape and ri b) is the site of action c) is associated with s d) Protects the cell fre | loes all of the followin gidity to the cell for some antibiotics some symptoms of dis om phagocytosis | g except ease | |
| 9. | A slippery outer cov host cells is a) Cell wall | ering in some bacteria b) Capsule | that protects them fro | om phagocytosis by d) Peptidoglycan |
| 10. | Which of the followin a) Plasmids c) Flagella | ng contains polysaccha | nride? b) Pili d) Gram negative cel | l wall |
| 11. | Flagella and pili are 1 a) Lipids | nade of b) Carbohydrates | c) RNA | d) Protein |
| 12. | When flagella are loc a) Polar | ated around the entire b) Random | bacterial cell, the arra c) Bipolar | ngement is called d) Peritrichous |

| 13. | An encapsulated cell a) Nonpathogenic | l will reproduce to for b) Translucent | m colonies that appear c) Pink | d) Smooth |
|-----|---|---|--|------------------------|
| 14. | Energy is stored in th a) Sugar portion c) Third phosphate b | he ATP (adenosine trij oond | phosphate) molecule ir b) Adenine portion d) none of the above | n its |
| 15. | Organisms that ferr | nent glucose may pro | oduce any of the follo | owing end products |
| | a)Lactic acid | b) Propionic acid | c) Alcohol | d) Oxygen |
| 16. | Outer membrane pro a) Gram -positive ba c) Mycoplasmal men | oteins are present in:- acteria nbranes | b) Gram – negative b d) Tonoplast membr | pacteria ranes |
| 17. | The bacterial envelog a) Capsule | pe includes all of the f b) Cell wall | ollowing structures exo c) Cell membrane | cept – d) Endospore |
| 18. | 9+2 fibrillar arranger a) Bacterial flagella c) Eukaryotic flagella | ment is present in a | b) Bacterial fimbriae d) T4 bacteriophage | |
| 19. | Tissue engineering in a) Mesenchymal ster c) Growth factors | nvolves utilization of n cells | b) Biomaterials d) All the above | |
| 20. | Nanomaterials can b a) Tissue engineering c) Controlled drug d | e used in g elivery | b) Cancer cell imagin d) All the above | ng |
| 21. | Bone marrow can gi a) Mesenchymal ster c) Totipotent stem ce | ve rise to n cells ells | b) Embryonic stem c d) bacterial stem cel | ells ls |
| 22. | Nucleosome contain a) DNA c) DNA and histones | S 3 | b) histones d) non histones | |
| 23. | Gene silencing can b a) siRNA | e obtained by b) micro RNA | c) antisense RNA | d) all the above |
| 24. | DNA is transcribed l a) RNA | oy RNA polymerase ir b) Protein | nto c) DNA | d) Gene |
| 25. | The enzyme involve a) RNA polymerase c) RNA polymerase | d in RNA transcription X V | n is b) RNA polymerase d) DNA polymerase | Π |
| 26. | Gene expression can a) Knock out c) Over expression | be altered by | b) Knock in d) All the above | |

| 27. | The transduction me a) Lipids | eans introducing DNA b) Virus | A into mammalian cells c) Polymers | by d) Plasmid |
|-----|---|---|---|--|
| 28. | mRNA may have a) poly (T) tail c) poly a) tail | | b) poly (G) tail d) amino acid | |
| 29. | RNA can be degrad a) DNAse | ed by b) RNAse | c) Proteinase | d) Protease |
| 30. | RNA splicing involv a) Exons | ves removal of b) Introns | c) Promoters | d) DNA |
| 31. | A sensitive method a) Real time RT-PCF c) Northern blot | to quantify expressior R | n of mRNAs is b) Western blot d) Southern blot | |
| 32. | Proteins can be sepa a) Northern blot c) Southern blot | rated and identified b | y b) Western blot d) North southern | |
| 33. | Protein phosphoryla a) Kinases | ation is mediated by b) Phosphatases | c) Proteases | d) Phospholipases |
| 34. | A DNA strand h complementary stra a) T-G-T-C-G-G-C-A c) U-G-U-C-G-G-C-A | as the sequence A nd? A-T A-U | -C-A-G-C-C-G-T-A. V b) A-C-A-G-C-C-G- d) G-T-G-A-T-T-A-C | What would be its T-A C-G |
| 35. | A nucleoside consis a) A pentose sugar a b) A pentose sugar a c) A hexose sugar a d) A phosphate grou | ts of: and a nitrogeneous he and a oxygen base. ad a nitrogeneous hete ap, a pentose sugar an | terocyclic base. erocyclic base. Id a nitrogeneous heter | ocyclic base. |
| 36. | The number of hyd: is | rogen bonds that hold | l the Adenine - Thymi | ne base pair together |
| | a) 2 | b) 3 | c) 4 | d) 5.5 |
| 37. | The DNA molecules a) Phosphate backbo c) Type of nucleotid | s of different species d one es | iffer in their: b) Sequence of base d) lipid content | 5 |
| 38. | Because one origin daughter cell (after o a) Semiconservative c) Derivative | al strand of the dou cell division), the DNA | ble stranded DNA he A replication process is b) Conservative d) Dispersive | lix is found in each : |
| 39. | When tryptophan producing genes in a) trp operator c) trp polymerase | is present in the r E. coli is stopped by a | nedium, the transcrij helix-turn-helix regula b) trp repressor d) trp promoter | ption of tryptophan ator binding to the |

| 40. | In order for a gene to helix and be able to b | ler for a gene to be transcribed, RNA polymerase must have access to the DNA and be able to bind to the genes | | |
|-----|--|--|---|--|
| | a) Activator | b) Regulator | c) Promoter | d) Repressor |
| 41. | The most common eukaryotes is a) Translational contr c) Post-transcriptiona | form of gene expr ol ll control | ession regulation in b) Transcriptional co d) Control of passag | both bacteria and ontrol ge from the nucleus |
| 42. | <i>E. coli</i> is able to use foods other than glucose in the absence of available glucose, because falling levels of glucose cause an increase of | | | of available glucose, |
| | a) CAIVIP | b) Martose | c) Giu operons | a) trina |
| 43. | Which of the followin a) Structural genes c) An operator | ng is part of an operon | ? b) a CAP binding sit d) All the above | te |
| 44. | If the uracil content is a) Reverse transcripti c) Replication | s exhausted, the follow on | ving process will imm b) Transcription d) Translation | ediately stop: |
| 45. | Shine-Dalgarno sequence is: a) Found at the 3' end of a prokaryotic gene b) Found in 16S rRNA c) Complementary to an mRNA sequence d) Located upstream of the AUG initiation codon of a prokaryotic mRNA | | | |
| 46. | The enzyme catalyzir a) Alanine-tRNA poly c) tRNA-Alanyl poly: | ng the binding of Alan ymerase merase | ine to its tRNA is call b)Alanine-tRNA tra d)Alanyl-tRNA synt | ed: nsferase thetase |
| 47. | The sequence of base complex of RNA poly is called: | es located prior to the ymerase and sigma fac | gene (along the DNA ctors attaches itself to | A strand), to which a initiate transcription |
| | a) Promotor | b) Terminator | c) Exon | d) Activator |
| 48. | Which of the followir a) Addition of 5' cap c) Addition of poly A | ng is not part of RNA j . tail | processing in eukaryc b) RNA splicing d) Reverse transcrip | tion |
| 49. | In recombinant DNA or microorganism, ar | technology, a selecte ad is inserted into wha | ed gene is removed fr t? | om an animal, plant, |
| | a) A primer | b) A palindrome | c) A vector | d) An organism |
| 50. | A method used to dis a) Polymerase chain r b) DNA replication c) Reverse transcripta d)Restriction fragmen | stinguish DNA of one reaction ase at length polymorphis | individual from anotl m. | her is |

- 51. Why are DNA polymerases from thermophilic organisms used in the polymerase chain reaction?
 - a) Because they are required to keep the two strands separated
 - b) Because they cannot add new nucleotides at low temperatures
 - c) Because they are easier to isolate than psychrophilic DNA polymerases
 - d) Because the priming and extension steps must be carried out at high temperatures to prevent the single strands from reannealing
- 52. In the Sanger method of DNA sequencing, what causes the termination of chain elongation?
 - a) The incorporation of a regular DNA nucleotide
 - b) Denaturation of the double-stranded test fragments
 - c) The incorporation of a dideoxynucleotide
 - d) When the DNA polymerase encounters a stop codon
- 53. The technique that utilizes probes to detect specific DNA sequences is known as what?

| a) Southern blot | b) Western blot |
|------------------|----------------------|
| c) Eastern blot | d) Northwestern blot |

- 54.The insertion of a cloning vector into a cloning host typically involves what process?a) Polymerase chain reactionb) Transformationc) Hybridizationd) Conjugation
- 55. Transgenic microorganisms have been used to improve or benefit all but which of the following?
 a) Meat yield
 b) Medical diagnosis
 c) Crop improvement
 d) Bioremediation
- 56.Genetically identical organisms derived from a single genetic source are called
a) Populationsb) Varietiesc) Sibling speciesd) Clones
- 57. Which of the following is not an application of genetic engineering in plants?a) Nitrogen fixation
 - b) DNA vaccines
 - c) Resistance to glycolysis
 - d) Production of insecticidal proteins in plants
- 58. Why does the Environmental Protection Agency closely monitor the release of transgenic bacteria used for agricultural purposes?
 - a) They want to monitor the destruction of crops by the GMOs.
 - b) They want to observe the effect the GMOs have on crops.
 - c) They want to ensure the GMOs do not proliferate in the environment and pose a threat to humans.
 - d) They want to ensure that people are aware that GMOs may have played a role in the production of a particular food product.
- 59. For an enzyme that displays Michaelis-Menten kinetics, the reaction velocity (as a fraction of V_{max}) observed at [S] = 2, K_M will be
 - a) 0.09 b) 0.33 c) 0.66 d) 0.91

| 60. | The Monod-Wyman-Changeoux account for a) Heterotropic interactions b) Negative cooperativity c) Non-integral values of n_H d) Positive cooperativity in enzyme | ("concerted") model for cooperativity cannot kinetics |
|-----|--|--|
| 61. | Why is the Lineweaver-Burk plot im a) It reveals the presence of organ b) It is a single-reciprocal plot. c) It makes it easier to determine d) It illustrates enzyme specificity | nportant in enzyme kinetics? nic prosthetic groups in enzymes. Vmax. y. |
| 62. | Enzyme activity may depend a) Salt concentration c) Types of buffer | b) Temperature d) all the above |
| 63. | When the medium contains more th a) Balanced growth c) Unbalanced growth | an one carbon source, the phenomenon is b) Diauxic growth d) Uncontrolled growth |
| 64. | Which of the following procedure culture to regulate the flow of cultur a) Chemostat c) Hemostat | s uses a photocell to measure absorbance of a re media? b) Trubidostat d) Petroff-Hausser chamber |
| 65. | An unstructured model assumes a) Fixed cell composition c) Pseudo balanced growth | b) Balanced growth d) Both A and B |
| 66. | Growth Modelling by multiple subs a) Cybernetic approach c) Unstructed approach | trates is referred to as b) Structured approach d) Chemostat approach |
| 67. | For the Monod equation, which para a) μ_{max} = maximum growth rate c) μ = growth rate | ameter is incorrectly identified? b) K _s = monod coefficient d) S = substrate type |
| 68. | In the Michaelis-Menten kinetics, at by: a) K _m = 2S c) K _m = S/4 | $2V = V_{max}$, the relation between K_m and S is given b) $K_m = S/2$ d) $K_m = S$ |
| 69. | Identify the right units for reaction r | rate constant from the given list: |
| | a) mol ² * L ⁻² * sec ⁻¹ c) L ² * mol ⁻² * sec ⁻¹ | b)L * mol ⁻² * sec ⁻¹ d) L ² * sec * mol ⁻² |

- 70. Which statement is true for an enzyme?
 - a) Enhances the rate of the reaction and does not affect the equilibrium
 - b) Affects the equilibrium but does not affect the reaction rate.
 - c) Enhances the reaction rate, but also affects the equilibrium concentration of products and reactants.
 - d) Does not affect kinetics and thermodynamics of the reaction.
- 71. Which of the following cases are likely to lead to faster rates of catalysis by an enzyme immobilized on a negatively charged support?
 - a) A positively charged substrate and a negatively charged product
 - b) A negatively charged substrate and a positively charged product
 - c) A positively charged substrate and a positively charged product
 - d) A negatively charged substrate and a negatively charged product
- 72. Which one of the following techniques is NOT ideal for immobilized cell free enzyme?
 - a) Physical entrapment by encapsulation
 - b) Covalent surface bonding to surface carriers
 - c) Physical bonding to surface carriers

a) Increases

- d) Covalent chemical bonding by cross-linking the precipitate
- 73. In fermentors, as the rate of aeration increases, the bubble size:

| b) Stays | consistent |
|----------|------------|
| | b) Stays |

- c) Becomes inconsistent d) Decreases
- 74. The microbial death kinetics constant is given by the equation: $(k_d \text{ is death kinetics rate constant and } k_o \text{ is arrhenius constant, } R \text{ is universal gas constant, } T \text{ is absolute temperature and } E \text{ is the activation energy})}$

a)
$$k_d = k_o e^{E/RT}$$

b) $k_o = k_d e^{-E/RT}$
c) $RT \ln\left(\frac{k_o}{k_d}\right) = -E$
d) None of the above

- 75. Which of the following is essential in an industrial scale aerobic fermentation:
 - a) Oxygen is supplied along with the media and there is no further requirement for oxygen
 - b) Mixing with an impeller is adequate to insure proper aeration
 - c) Heat needs to be provided to maintain the temperature
 - d) cooling is necessary to maintain temperature
- 76. The main function of the sparger in industrial scale fermentor is to:
 - a) Introduce small air bubbles to help areate the medium
 - b) Add sterile nutrients
 - c) Aid the cooling of the fermentor
 - d) Introduce steam in the fermentor during sterilization
- 77. In secondary metabolism two distinct phase trophophase and idiophase refer respectively to:
 - a) Growth and production phase
 - b) Early and late phases
 - c) Primary and secondary metabolism
 - d) Lag phase and log phase

| 78. | The precursor molecule for penicillin-G bio a) Phenyl acetic acid c) Acetic acid | synthesis during fermentation process is: b) Phenoxyacetic acid d) Phosphoric acid |
|-----|--|---|
| 79. | The solubility of oxygen drops significantly a) at 10 °C c) Above 40 °C | r: b)at 40 °C d)Below 40 °C |
| 80. | For scaling up of a bioreactor, the following a) Airflow rate b) Diameter of the impeller c) Agitator tip speed d) Volumetric mass transfer coefficient | g parameter is assumed to be constant: |
| 81. | The $\Delta G^{o'}$ of a catabolic reaction is: a) Positive c) Zero | b)Negative d)Depends on the reaction conditions |
| 82. | An endergonic reaction: a) Proceeds spontaneously c) Overall requires energy | b) Does not require activation energy d) Requires an enzyme |
| 83. | Which of the following has not been used in a) Unicellular bacteria c) Yeasts | n bioconversions? b)Actinomycetes d) Virus |
| 84. | The use of microorganisms to carry out spe a)Biosynthesis c)Biotransformation | cific chemical is termed b) Bioconversion d) All the above |
| 85. | Two proteins have same molecular w composition. They can be separated by: a) Reverse phase chromatography c) Ion-exchange chromatography | reight but differ in their amino acid b)Gel filtration d)Hydrophobic chromatography |
| 86. | Ultrafilration process cannot be used for: a) Fractionation of protein c) Harvesting of cells | b)Desalting of proteins d) Selective removal of solvents |
| 87. | An enzyme solution is centrifuged and hi added. What is observed immediately? a) Crystallization of enzyme occurs b) The solution color changes to blue c) The enzyme particles dissolve completely d) The OD of the solution decreases | gh concentration of ammonium sulfate is |
| 88. | Which of these is an imino acid: a) Glutamic acid b)Proline | c)Tryptophan d) Threonine |
| 89. | Which two systems work with the skeletal s a) Immune and excretory c) Nervous and muscular | system to cause a finger to move? b) Digestive and respiratory d) Circulatory and integumentary |

| 90. | Trypsin is a protease that specifically cleave a)Hydrophobic residues c) Lysine and arginine residues | es at the C-terminus of: b) Basic residues d) Tyrosine residues |
|------|--|---|
| 91. | All of these should be considered when stor a) Correct labeling of chemicals c)Shape of the storage containers | ring acids EXCEPT the – b)Safety of people in the building d)Separation of incompatible chemicals |
| 92. | In order for a species to survive, it must be a) Consume a wide variety of food b) Reproduce successfully c) Maintain a constant body temperature d) Destroy competing species | able to |
| 93. | Anton van Leeuwenhoek is credited with theory of biology was a direct result of Leeu a) The theory of natural selection c) The theory of independent assortment | developing the first microscope. Which wenhoek's work? b) The Gaia theory d) The cell theory |
| 94. | Edward Jenner helped control smallpox by a) Jennerization c) Flagellation | developing the process of — b)Pasteurization d) Vaccination |
| 95. | Which organelle has the most control over a a) Cell membrane c) Nucleus | a cell's functions? b) 18S Ribosome d) Mitochondria |
| 96. | The pineal gland produces melatonin dur events supports the hypothesis that infants months of age?a) Infants begin to roll over.b) Infants nap for three hours each afternoc) Infants grasp at moving objects.d) Infants start sleeping through the night. | ing periods of darkness. Which of these begin producing melatonin at about three on. |
| 97. | The immunofluorescence test can be used to a) Protein molecules and polysaccharide no b) Lipid molecules and nucleic acid molecules c) Antibody molecules and antigen molecules d) Cytoplasmic molecules and cell wall molecules | o identify nolecules ules ules blecules |
| 98. | The terminator and promoter regions funct a)Endoplasmic reticulum c) Plasma membrane | ioning in protein synthesis exist on the b)DNA molecule d) Nuclear membrane |
| 99. | Macrophages and dendritic cells belong to a)Both innate and humoral immunity c) Acquired immunity | b) Innate immunity d) Both innate and acquired immunity |
| 100. | CD4 and CD8 are markers of a) T lymphocytes c) Macrophages | b)Chloroplasts d) B lymphocytes |

GIS (Section code 09)

1. Find the work done by a constant force $\overline{F} = 2\hat{i} + 4\hat{j}$, if its point of application to a block moves from A(1,1) to B(4,6)

2. If $u(x, y) = x^3 - 3xy^2 - 5y$, then its harmonic conjugate function is

a)
$$3x^2y - y^3 + c$$

b) $3x^2y - y^3 + 5x + c$
c) $3x^2y - y^2 - 5x + c$
d) $3xy^2 - y^3 + 5x + c$

3. The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where D \equiv \frac{d}{dx}\right)$ is

a)
$$\frac{1}{30}(\cos 3x - \sin 3x)$$

b) $\frac{1}{30}(2\cos 3x + \sin 3x)$
c) $\frac{1}{30}(2\cos 3x - \sin 3x)$
d) $\frac{1}{30}(\cos 3x - \sin 3x)$

4. The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is

5. if
$$\overline{F} = (3x^2 - 3yz)\hat{i} + (3y^2 - 3zx)\hat{j} + (3z^2 - 3xy)\hat{k}$$
, then div \overline{F} is
a) $6(x+y+z)$ b) $6(x-y-z)$ c) $3(x+y+z)$ d) $2(x+y+z)$

6. If X is a poisson variate such that
$$P(X=1)=\frac{3}{10}$$
 and $P(X=2)=\frac{1}{5}$, find λ
a) $\frac{3}{4}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{1}{4}$

7. If
$$A+B=\begin{pmatrix} 1 & -1 \\ 0 & -3 \end{pmatrix}$$
 and $A-B\begin{pmatrix} 3 & 1 \\ 1 & 4 \end{pmatrix}$, then the product AB is

a)
$$\begin{pmatrix} -1 & -1 \\ 0 & -3 \end{pmatrix}$$
 b) $\begin{pmatrix} 0 & -1 \\ -1 & -3 \end{pmatrix}$ c) $\begin{pmatrix} 0 & -6 \\ -2 & -2 \end{pmatrix}$ d) $\begin{pmatrix} -2 & -2 \\ 0 & -6 \end{pmatrix}$

8. The value of
$$\int_0^{\frac{\pi}{2}} \cos^6 x \, dx$$
 is

a)
$$\frac{3\pi}{32}$$
 b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$ d) $\frac{\pi}{32}$

9. Find the points at which the function $f(z) = \frac{z}{z^2 - 1}$ is not analytic.

a)
$$z = \pm 1$$
 b) $z = \pm 2$ c) $z = 1$ d) $z = -1$

10. If
$$x = a (\cos t + t \sin t)$$
, $y = a (\sin t - t \cos t)$, find $\frac{dy}{dx}$

- 11. The art and science of mapmaking is known as
 - a) Remote sensing
 - b) GIS
 - c) GPS
 - d) Cartography
- 12. The identification and analysis of phenomena on the Earth's surface by using devices borne aircraft / elevator is
 - a) Geological technique.
 - b) Geo-Physical technique.
 - c) Photogrammetry.
 - d) Geographical Information System.
- 13. Raster data is represented by
 - a) Line
 - b) Points
 - c) Polygons
 - d) Grids
- 14. Smallest unit of the picture is
 - a) Dcm
 - b) Pixel
 - c) Pictorial unit
 - d) Pascal
- 15. GCP stands for
 - a) Graphical control point
 - b) Ground control point
 - c) Geographical control point
 - d) None of the above
- 16. Which of the following is not GPS satellite constellation?
 - a) NAVSTAR
 - b) GLONASS
 - c) GALILEO
 - d) INSAT
- 17. In India, remote sensing data/images can be obtained from
 - a) National Remote Sensing Centre, Hyderabad
 - b) Indian Space Research Organization, Bangalore
 - c) Space Research Centre, Ahmadabad
 - d) Survey of India
- 18. From the following satellites which one is not a meteorological satellite ?
 - a) NOAA
 - b) INSAT
 - c) GOES
 - d) IKONS

- 19. Which of the following sensor is used for fire monitoring?
 - a) NOAA
 - b) AVHRR
 - c) MODIS
 - d) AEIFS
- 20. IRS is a
 - a) Aircraft
 - b) Sensor
 - c) Satellite
 - d) Launch Vehicle
- 21. RADAR stands for
 - a) Radio Audio Development and Research
 - b) Regional Application for Data Analysis and Research
 - c) Radio Detection And Ranging
 - d) Radio Detection And Receiver
- 22. Which of the following spatial resolution images will show more detail?
 - a) 15.m
 - b) 5.8m
 - c) 23.5m
 - d) 0.61m
- 23. ISRO stands for
 - a) International Science Research Organization
 - b) International Space Research Organization
 - c) Indian Space Research Organization
 - d) Indian Science Research Organization
- 24. Cartosat-1 is
 - a) Indian satellite
 - b) US satellite
 - c) Japan satellite
 - d) Russian satellite
- 25. The distance can be measured indirectly using distance measured instruments called
 - a) Tachometer.
 - b) Theodolite.
 - c) EDM.
 - d) Clinometer's.
- 26. The art of obtaining information about an object on earth surfaces without being in physical contact is known as
 - a) Photogrammetry
 - b) Optics
 - c) Remote sensing
 - d) Satellite Imaging
- 27. Airborne platform is
 - a) Balloon
 - b) Satellite
 - c) Aircraft
 - d) both a and c

- 28. The Photographs used in Photogrammetry are
 - a) Aerial Photos and Terrestrial Photos
 - b) Color photos
 - c) B&W photos
 - d) Color and B& W Photos
- 29. Application of Photogrammetry particularly in urban management is
 - a) Road Alignment
 - b) Height of the building
 - c) Delineation of boundary of buildings
 - d) All the above
- 30. Stereo pair Images are generated by
 - a) Overlapping two Images
 - b) Non-Overlapping two Images
 - c) Over-lapping 3-Images
 - d) Overlapping 4 images
- 31. The degree of tilt in a tilted photograph is
 - a) 1° to 3°
 - b) 1° to 7°
 - c) 1° to 6°
 - d) 1° to 5°
- 32. -----controls the amount of light entering the photographic camera
 - a) Lens
 - b) Shutter
 - c) Aperture
 - d) Diaphragm
- 33. The aerial Photogrammetry used for Non-Engineering applications like
 - a) Soil Maps of Geological
 - b) Tax Maps of Forest map
 - c) Astronomy of Archaeology map
 - d) All the above
- 34. Energy incidence is equal to
 - a) Reflection + Absorption + Transmission
 - b) Reflection only
 - c) Reflection + Emission
 - d) Emission + absorption
- 35. The point on the ground coinciding with the optical axis of the camera is known as a) Principle point
 - b) Fiducial point
 - c) Nadir
 - d) Floating mark
- 36. Orthophotos are
 - a) Photographs without distortions
 - b) Photographs with distortions
 - c) Photographs with relief displacement
 - d) Photographs with tilt

- 37. Ground control points in Photogrammetry used for
 - a) Interior orientation
 - b) Exterior orientation
 - c) Absolute orientation
 - d) Relative orientation
- 38. Scale is defined as ratio between
 - a) Distance on ground by distance on MAP
 - b) Distance on Map by Distance on ground
 - c) Distance on the ground and airways
 - d) None of the above
- 39. Relief displacement is defined as
 - a) Change in Height
 - b) Change Shape
 - c) Change in Size
 - d) All
- 40. Uses of Stereoscope are
 - a) Elimination of Parallax
 - b) Getting 3D-view
 - c) Exact Projection of Height visualized
 - d) Getting elevation
- 41. Titled photograph requires
 - a) Geometric Correction
 - b) Linear Correction
 - c) Angular Correction
 - d) All
- 42. In a photo theodolite, the camera is
 - a) Below the telescope.
 - b) Above the telescope.
 - c) Below and above telescope
 - d) Attached with any one of the telescope side
- 43. The system for referring locations on the earth is known as
 - a) Bench mark
 - b) MSL / Datum
 - c) X, Y & Z co-ordinates
 - d) All the above
- 44. In remote sensing the Black & White images are called
 - a) Panchrometric
 - b) Multi-spectral
 - c) Digital
 - d) Spectral
- 45. The arrangement of electromagnetic energy according to wavelength or frequency is known as
 - a) Electronic spectrum
 - b) Magnetic spectrum
 - c) Electromagnetic spectrum

- d) Electronic distance measurement
- 46. The wave length range of visible region in EMR is
 - a) 0.4 to 0.7 μm.
 - b) 1mm to 300 mm.
 - c) 0.03 to 0.04 m.
 - d) 0.01m to 0.07 m.
- 47. The wave theory of light was proposed by
 - a) Newton.
 - b) Huygens.
 - c) Maxwell.
 - d) All of the above.
- 48. Remote Sensing major components are.
 - a) Sensor / Camera
 - b) EMR
 - c) Satellite / Platform
 - d) All the above
- 49. The relationship between Wavelength and wave frequency is
 - a) Wave length = wave frequency
 - b) Wave length = (1/ wave frequency)
 - c) Wave length = 2 wave frequency
 - d) Wave length = 3 wave frequency
- 50. 1:50,000 in topographic map means
 - a) 1cm on the map equals to 5000 cm on ground
 - b) 1cm on the map equals to 5000 m on ground
 - c) 1cm on the map equals to 500 m on ground
 - d) 1cm on the map equals to 50,000 cm on ground
- 51. Plants appear green in color because of high -----of green wavelength
 - a) Refraction
 - b) Reflection
 - c) Absorption
 - d) Transmittance
- 52. Which of the following wavelength band is absorbed by Chlorophyll present in the leaf?
 - a) Red and Green
 - b) Red and Blue
 - c) Blue and Green
 - d) Red and Blue
- 53. The size of the smallest object that can be discriminated by the sensor is known as
 - a) Spectral resolution
 - b) Spatial resolution
 - c) Radiometric resolution
 - d) Temporal resolution
- 54. Energy is transmitted through space matter by means of
 - a) Electromagnetic waves.

- b) Light waves.
- c) Sound waves.
- d) Sea weaves.
- 55. The number of wave cycles completed with respect to time is called
 - a) Wave length.
 - b) Cycle.
 - c) Frequency.
 - d) Velocity.
- 56. The Infrared wave is classified into
 - a) NIR, MIR & FIR
 - b) NIR, FIR, TIR & FIR
 - c) TIR & FIR
 - d) NIR & FIR
- 57. The region of atmosphere through which the electromagnetic radiations passes without attenuation
 - a) Atmospheric influences
 - b) Atmospheric doors
 - c) Atmospheric widows
 - d) Atmospheric greenhouse
- 58. ______ is the type of EDM instruments, which are used for measure the distance electronically.
 - a) GPS.
 - b) Clinometers.
 - c) Compass.
 - d) Total station
- 59. Latitude, Longitude and Elevation on the earth surface are measured by
 - a) Aerial camera.
 - b) Compass.
 - c) GPS.
 - d) Digital Camera.
- 60. Remote sensing technique is expansive, because
 - a) if apply in small areas
 - b) Processing software is costly
 - c) Large scale map cannot be prepared
 - d) All the above
- 61. The data acquired by the remote sensing system are recorded on
 - a) CCD.
 - b) Floppy.
 - c) CD-Rom.
 - d) Film.
- 62. Name of the secondary storage device in the computer system
 - a) Hard-disk.
 - b) Floppy.
 - c) CD or Compact-Disk.
 - d) All the above.

- 63. SQL refers to
 - a) Structured Query Language.
 - b) System Query Language.
 - c) Synthesis Query Language.
 - d) None of these.
- 64. DDBMS refers to
 - a) Distributed Database Management System
 - b) Delayed Database Management System
 - c) Devoted Database Management System
 - d) Decorated Database Management System
- 65. In database the primary key is called.
 - a) Unique type of key
 - b) Two different types of key
 - c) Multiple number of key
 - d) All the above.
- 66. GUI refers to
 - a) Geological Union Interface.
 - b) Geological User Interface.
 - c) Geographical user Interface.
 - d) Graphical user Interface.
 - _____ is the programming software used for management of DBMS
 - a) Visual Basic
 - b) Oracle.
 - c) SQL.

67.

d) All the above.

68. In a student database the "student_name" is a type of

- a) Attribute data
- b) Spatial data
- c) Vector data
- d) Measurable data
- 69. 1 byte=?.
 - a) 1.6 bit.
 - b) 8 bit.
 - c) 32 bit.
 - d) 128 bit.
- 70. In Database management system DML refers to
 - a) Data Manipulation Language
 - b) Data Multiplication Language
 - c) Data Monitoring Language
 - d) Data Mutual Language
- 71. Server Principles involve
 - a) Connecting all the clients
 - b) Distributing software to all the clients
 - c) Connecting all the clients to the printer
 - d) All the above.

- 72. A database having one in many relationship is called
 - a) Hierarchal
 - b) Relational
 - c) Network
 - d) All the above
- 73. ROM refers to
 - a) Random Only Memory.
 - b) Read Only Memory.
 - c) Relay Only Memory.
 - d) All the above.
- 74. RDBMS refers to
 - a) Regional Database Management System.
 - b) Random Database Management System.
 - c) Relational Database management System.
 - d) Resources Database Management System
 - _____will be indicating the speed of the computer
 - a) ROM

75.

- b) RAM
- c) Hard Disk
- d) All the above.
- 76. LCD meant by,
 - a) Liquid Crystal Display.
 - b) Light Crystal Display.
 - c) Light Common Display.
 - d) Liquid Color Display.
- 77. Watershed management is.
 - a) To conserve the water
 - b) To increase groundwater potential
 - c) To minimize the soil loss
 - d) All the above
- 78. Soil Erosion by raindrops is called
 - a) Rill erosion
 - b) Inter -rill erosion
 - c) Splash erosion
 - d) Sheet erosion
- 79. The ground surface is highly means with irregular elevation and depressions, shapes, plains are called.
 - a) Topography.
 - b) Geography.
 - c) Geology.
 - d) Land forms.
- 80. Marble is a type of
 - a) Volcanic rock
 - b) Plutonic rock
 - c) Sedimentary rock

- d) Metamorphic rock
- 81. Evaporation is measured by
 - a) Water level indicator
 - b) Pan-Evaporimeter
 - c) Iso-heights
 - d) Water meter
- 82. Kharif season falls on
 - a) Jan-May.
 - b) Oct-April.
 - c) June-Sept.
 - d) March-October.
- 83. The Hydrological components are
 - a) Precipitation
 - b) Evaporation
 - c) Infiltration
 - d) All the above
- 84. Hydrograph is related to
 - a) Rainfall vs Time.
 - b) Rainfall vs Runoff.
 - c) Runoff vs Time.
 - d) All the above.
- 85. Overdraft of ground water in coastal region leads
 - a) Aquifer depletion
 - b) Saline water intrusion
 - c) No change in the aquifer
 - d) a and b
- 86. Detachment of soil particles due to action of wind and water is called
 - a) Soil Erosion
 - b) Soil Sedimentation
 - c) Siltation
 - d) Soil dehydration
- 87. Rainfall measured by the instruments of
 - a) Rainfall collector
 - b) Rainfall meter
 - c) Rain-gauge.
 - d) Rainfall pan
- 88. Which of the following materials has the least porosity?
 - a) Clay
 - b) Silt.
 - c) Sand
 - d) Gravel
- 89. Catchments of water bodies located in
 - a) Down-stream side
 - b) Up-stream side

- c) Both includes up and down stream sides
- d) Part of the down-stream side
- 90. It is a slow or sudden downhill movement of slope forming surface materials under the force of gravity.
 - a) Earth Quake
 - b) Tsunami
 - c) Land Slide
 - d) All the above
- 91. Contours are drawn by
 - a) Joining rain gauge station locations
 - b) Drawing equal angles
 - c) Drawing lines of equal elevations.
 - d) Drawing lines of equal precipitation depth for a given numbers.
- 92. Infiltration is measured by.
 - a) Double ring infiltrometer.
 - b) Lysimeter
 - c) Filtration techniques
 - d) Single ring infiltrometer

93. ______ is the process of water convert from liquid state to vapour state

- a) Evaporation
- b) Transpiration
- c) Evapotranspiration
- d) Rainfall
- 94. The potential ability of groundwater depends on
 - a) Aquifer condition
 - b) Soil porosity
 - c) Soil permeability
 - d) All the above
- 95. The average rainfall can be estimated from number of rain-gauges stations by
 - a) Thiessen polygon method
 - b) Arithmetic mean method
 - c) Isohyets method
 - d) All the above
- 96. An aquifer which is located in between impervious layer is called
 - a) Unconfined aquifer
 - b) Confined aquifer
 - c) Semi-Confined aquifer
 - d) Semi unconfined aquifer
- 97. The Rainfall starts to surface runoff at the condition of.
 - a) Soil saturation capacity
 - b) Soil Field capacity
 - c) Soil bearing capacity
 - d) Soil wilting point

- 98. In agriculture the remote sensing technique can be applied for
 - a) Yield forecasting
 - b) Crop differentiation
 - c) Crop condition
 - d) All the above
- 99. Wind erosion is caused by
 - a) Storms of high intensity
 - b) Mismanagement of land resources
 - c) Type of soil
 - d) All the above
- 100. The advanced and final stage of soil erosion by flow of runoff water is called
 - a) Rill erosion
 - b) Inter -rill erosion
 - c) Splash erosion
 - d) Gully erosion

Environmental (Section code 10)

1. Find the work done by a constant force $\overline{F} = 2\hat{i} + 4\hat{j}$, if its point of application to a block moves from A(1,1) to B(4,6)

2. If $u(x, y) = x^3 - 3xy^2 - 5y$, then its harmonic conjugate function is

a)
$$3x^2y - y^3 + c$$

b) $3x^2y - y^3 + 5x + c$
c) $3x^2y - y^2 - 5x + c$
d) $3xy^2 - y^3 + 5x + c$

3. The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where D \equiv \frac{d}{dx}\right)$ is

a)
$$\frac{1}{30}(\cos 3x - \sin 3x)$$

b) $\frac{1}{30}(2\cos 3x + \sin 3x)$
c) $\frac{1}{30}(2\cos 3x - \sin 3x)$
d) $\frac{1}{30}(\cos 3x - \sin 3x)$

4. The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is

5. if
$$F = (3x^2 - 3yz)\hat{\imath} + (3y^2 - 3zx)\hat{\jmath} + (3z^2 - 3xy)\hat{k}$$
, then divF is
a) $6(x+y+z)$ b) $6(x-y-z)$ c) $3(x+y+z)$ d) $2(x+y+z)$

6. If X is a poisson variate such that
$$P(X=1)=\frac{3}{10}$$
 and $P(X=2)=\frac{1}{5}$, find λ
a) $\frac{3}{4}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{1}{4}$

7. If
$$A+B=\begin{pmatrix} 1 & -1 \\ 0 & -3 \end{pmatrix}$$
 and $A-B\begin{pmatrix} 3 & 1 \\ 1 & 4 \end{pmatrix}$, then the product AB is

a)
$$\begin{pmatrix} -1 & -1 \\ 0 & -3 \end{pmatrix}$$
 b) $\begin{pmatrix} 0 & -1 \\ -1 & -3 \end{pmatrix}$ c) $\begin{pmatrix} 0 & -6 \\ -2 & -2 \end{pmatrix}$ d) $\begin{pmatrix} -2 & -2 \\ 0 & -6 \end{pmatrix}$

8. The value of
$$\int_0^{\frac{\pi}{2}} \cos^6 x \, dx$$
 is
a) $\frac{3\pi}{32}$ b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$

9. Find the points at which the function
$$f(z) = \frac{z}{z^2 - 1}$$
 is not analytic.

a)
$$z = \pm 1$$
 b) $z = \pm 2$ c) $z = 1$ d) $z = -1$

10. If
$$x = a (\cos t + t \sin t)$$
, $y = a (\sin t - t \cos t)$, find $\frac{dy}{dx}$

d) $\frac{\pi}{32}$

- The following factors are key drivers of globalization, 11.
 - a) Government action, exchange rates, competition and sociodemographic factors
 - b) Market convergence, competition, exchange rates and cost advantages.
 - c) Cost advantages, government action, economic cycles and competition.
 - d) Market, cost, competition and government policies.
- 12. The 1987 Montreal Protocol was signed for which of the following reasons?
 - a) To phase out the use of CFC's, found to be causing depletion of the ozone layer
 - b) To ban nuclear testing in tropical oceans
 - c) To begin converting from fossil fuel use to more renewable energy sources to reduce the anthropogenic greenhouse effect
 - d) To stop the global trade in products made from endangered tigers
- Approximately what proportion of the global land surface is used for agriculture and 13. grazing by the world's 6 billion people?

| a) One eightieth | b) Three quarters |
|------------------|-------------------|
| c) One third | d) One tenth |

- 14. Which of the following is not a major positive feedback mechanism in which the activity of humans to increase global climate temperatures leads to an even further increase?
 - a) Global warming causes increased CO₂ release from biomass decomposition
 - b) Global warming causes snow to melt in polar regions and therefore increases global albedo
 - c) Global warming causes increased rainfall, plant growth and photosynthesis
 - d) Tropical deforestation causes warming and drying so that remaining forests begin to decline
- What is the primary reason for targeting 'biodiversity hotspots' for conservation? 15.
 - a) The number of species threatened far exceeds our capacity to protect them and we can therefore only concentrate on areas of highest species diversity
 - b) To protect all areas of threatened species would not allow for new species to develop
 - c) They are the only areas where species are seriously threatened in the world
 - d) They are areas where people do not live and conservation would therefore not be effecting the economic development of the area
- Which of the following is not one of the prime health risks associated with greater 16. UV radiation through the atmosphere due to depletion of stratospheric ozone?
 - a) Increased skin cancer b) Reduced immune system
 - c) Damage to eyes

- d) Increased liver cancer
- 17. What is the harm from the depletion of Earth's ozone layer ?
 - a) The average temperature of earth's surface will increase gradually
 - b) The oxygen content of the atmosphere will decrease
 - c) Increased amount of Ultra violet radiation will reach earth's surface
 - d) Sea levels will rise as the polar ice caps will gradually melt
- 18. Acid rain is formed due to contribution from the following pair of gases
 - b) Oxygen and nitrous oxide
 - a) Methane and ozone c) methane and sulpher dioxide d) Carbon dioxide and sulpher dioxide

- 19. The most serious environmental effect posed by hazardous wastes is
 - a) air pollution.
 - c) increased use of land for landfills.
- 20. A major in-stream use of water is for
 - a) producing hydroelectric power.
 - c) agricultural irrigation.

b) dissolving industrial wastes.

b) violations of the Clean Water Act.

b) contamination of groundwater.

d) destruction of habitat.

d) domestic use.

d) irrigation.

- 21. Which of the following are the example of Municipal and industrial discharge pipes ?
 - a) nonpoint sources of pollution.
 - c) point sources of pollution.
- 22. The presence of high coliform counts in water indicates
 - a) contamination by human wastes.
 - b) phosphorus contamination.
 - c) decreased biological oxygen demand.
 - d) hydrocarbon contamination.
- 23. How the biological oxygen demand gets affected with the increased presence of organic matter in water?
 - a) the oxygen demand increases
 - b) the oxygen demand decreases
 - c) the oxygen demand remains unchanged
 - d) None of the above
- 24. The stage in which the biological processes is used to purify water in a wastewater treatment plants is called
 - a) secondary sewage treatment
- b) primary sewage treatment
- c) wastewater reduction
- d) biochemical reduction
- 25. Groundwater mining in coastal areas can result into
 - a) increase in the salinity of groundwater.
 - b) decrease in the toxicity of groundwater.
 - c) decrease in the salinity of groundwater.
 - d) increase in the water table.
- 26. The three primary soil macronutrients are
 - a) carbon, oxygen, and water.
 - b) copper, cadmium, and carbon.
 - c) potassium, phosphorus, and nitrogen.
 - d) boron, zinc, and manganese.
- 27. Which of the following is not a major source of groundwater contamination?
 - a) agricultural products
 - b) landfills
 - c) septic tanks
 - d) all of the above are major sources of groundwater contamination
- 28. The area of sociology that covers the size, composition, and distribution of populations is called ______.a) demographyb) anthropology
 - c) geography d) environmental sociology

| 29. | All the populations of plants and animal species that live and interact in a given area at a particular time, as well as the chemical and physical factors that make up the non-living environment are called a[n] | | | | |
|-----|--|---|--|--|--|
| | a) environmental microcosm c) socio-economic system | b) symbiotic world order d) ecosystem | | | |
| 30. | Removing natural resources from the environment and adding to environmental problems through pollution are major factors in a process called | | | | |
| | a) the biotechnological revolution c) the green revolution | b) environmental degradation d) the greenhouse effect | | | |
| 31. | Valuable, practical services that help to preserve ecosystems performed by nature are called | | | | |
| | a) the greenhouse effect c) biosphere balancing | b) ecosystem services d) biosphere balancing | | | |
| 32. | The two compounds that acid rain contract environment are and | The two compounds that acid rain contains that are most damaging to the environment are and | | | |
| | a) nitrogen; water c) carbon dioxide; sulfuric acid | b) sulfuric acid; nitric acid d) carbon dioxide; water | | | |
| 33. | The device on an automobile that filters harmful pollutants out of the exhaust before it enters the air is a[n] | | | | |
| | a) carburetor c) catalytic converter | b) alternator d) radiator | | | |
| 34. | The only gas in the atmosphere that can absorb the sun's dangerous ultraviolet radiation is | | | | |
| | a) nitrous oxide c) nitrogen | b) carbon dioxide d) ozone | | | |
| 35. | Approximately 70 percent of the earth is covered by water. Of this amount, approximately percent of it is suitable for human use. | | | | |
| | a) less than b) 10 | c) 20 d) 15 | | | |
| 36. | The largest amount of usable water found a) recreation b) crop irrigation | on earth is used for c) household use d) industrial uses. | | | |
| 37. | Societies that throw away large quantities of paper, plastic, metal and other materials are called | | | | |
| | a) recycling societiesc) disposable societies | b) toxic societies d) post industrial societies | | | |
| 38. | The part of geography that embodies map a) theodesy b) geodesy | making is known as c) calligraphy d) cartography | | | |
| 39. | A map scale of 1:15,000 means that a) one centimeter on the map equals 15,000 b) one foot on the map equals 15,000 feet o c) one inch on the map equals 15,000 inche d) all of the above |) centimeters on the ground on the earth as on the ground | | | |

| 40. | In a reversible adiabation a) infinity c) equal to C _v dT | atic change ∆S is | b) zero d) equal to nRln V2 | 2/ V1 |
|-----|---|---|---|------------------------------------|
| 41. | At constant temperature and pressure which one of the following statements is correct for the reaction? $CO(g) + 1/2O_2(g)> CO_2(g)$ | | | |
| | a) $\Delta H = \Delta E$ b) $\Delta H < \Delta E$ c) $\Delta H > \Delta E$ d) ΔH is independen | t physical state of rea | ctant | |
| 42. | Air Pollution, Prever a) 1981 | Air Pollution, Prevention and Control Act was enacted in India during the year,a) 1981b) 1982c) 1983d) 1984 | | |
| 43. | Permissible Fluoride a) 1 ppm | s limit in water as per b) 1.5 ppm | : I.S is c) 2.0ppm | d) 2.5ppm |
| 44. | What does 1mm on a a) 20m | a map drawn at scale b) 50m | of 1 in 20000 represer c) 75m | nt in the ground? d) 100m |
| 45. | Ten watts is equal to a) 10 N/m | b) 10 Nm/s | c) 10 Nm/h | d) 10 Nm |
| 46. | 5ppm is also expressed in/as a) 5 grams per Litre c) 5 kilograms per Litre | | b) 5 milligrams per Litre d) 5 grams per gallon | |
| 47. | Which of the following are key application dia a) Civil Engineering b c) Biology d | | disciplines for GIS? b) Mechanical Engineering d) Physics and Chemistry | |
| 48. | An anthropocentric world view as one cause of environmental problems is most aligned with which of the following perspectives?a) conflict perspectiveb) structuralist perspective d) symbolic interactionism | | | |
| 49. | What did Chernobyl, Three Mile Island, the Love Canal, and Bhopal, India all have in common? a) They were all nuclear disasters. b) They qualified as technological disasters. c) They all involved environmental racism. d) They were environmental problems caused by economic development. | | | |
| 50. | The two early conflict theorists who refuted the Malthusian Theory because they recognized that farming could match the food supply needs were and | | | |
| | a) Auguste Comte; H c) Robert Merton; M | Ienri Saint Simon ichael Burawoy | b) Karl Marx; Friec d) Edwin Sutherlar | lrich Engels nd; Donald Cressey |

51. The largest single component of municipal solid waste (MSW) is a) food wastes b) yarn wastes

c) plastics

- d) paper and paper products
- 52. Which of the following statements about waste-to-energy facilities is false?
 - a) They often compete with recycling programs for municipal solid waste.
 - b) They emit no air pollution because of air pollution control devices.
 - c) They substantially reduce the weight and volume of municipal solid wastes.
 - d) They can be used to generate electricity.

53. Which of the following components of municipal solid wastes can be recycled? a) paper and paper products b) metals c) glass and plastics d) all the above 54. The single most important item to recycle is what? a) glass jars b) plastics milk jugs c) newspapers d) aluminum canes 55. Which of the following is not a problem with landfills? a) leachate generation and groundwater contamination b) settling c) increasing runoff into lakes and streams d) methane production 56. Which of the following is not a drawback of waste combustion? a) increased air emissions b) competition with recycling activities c) requirement of large land areas to construct incinerators d) high costs 57. In the best of all possible worlds, the best strategy for managing MSW is to b) recycle it a) landfill it c) burn it d) reduce it at source

58. Which is known as the Umbrella Act? a) Water Act b) Air Act c) Soil Act d) Environmental Act

| 59. | The instrument used a) Imhoff cone | d for settleable solids i | s, b) Settleable Jar | | | |
|-----|--|---|-------------------------|----------|--|--|
| | c) Jar test apparatus | | d) Sedimentation Ta | ank | | |
| 60. | In a slow sand filter | In a slow sand filter the bacterial removal efficiency is | | | | |
| | a) 58% | b) 68% | c) 98% | d) 88% | | |
| 61. | What is a waste | What is a waste product normally excreted in the urine? | | | | |
| | a) Excess glucose | b) Excess protein | c) Red blood cells | d) Urea | | |
| 62. | What is the maximum noise level in industries at night time? | | | | | |
| | a) 75 dB | b) 70 dB | c) 65 dB | d) 60 dB | | |
| 63. | During fusion, the entropy of the system | | | | | |
| | a) decreases | b) increases | c) constant | d) zero | | |

| 64. | An isolated system | i is one which neit urroundings. | her shows exchange | of nor | |
|--|--|---|--|---|--|
| | a) heat, mass | b) density, weight | c) heat, density | d) mass, vapour | |
| 65 | $N_{a} + O_{a} = - > 2 N$ | O shows an | of heat | | |
| 00. | a) adsorption | b) absorption | c) neutralization | d) evaporation | |
| 66. | The Basel conventior a) Solid waste | is related to | b) Hazardous waste | | |
| | c) Water Pollution | | d) Air pollution | | |
| 67. | What is the Methodology adopted in EIA? | | | | |
| | a) Bessels Method | | b) Newton's Method | | |
| | c) Adhoc Method | | d) Hilton Method | | |
| 68. | ISO-hytes are drawn | by | | | |
| | a) Joining of rain gau | ige stations | | | |
| | b) Drawing perpendi | icular lines | | | |
| | c) Drawing lines of e | qual elevations | | | |
| | d) Drawing lines precipitations depth for a given rainguages. | | | | |
| 69. | The permissible limit | t of BOD from industr | ial wastewater effluen | t, while discharging | |
| | into running streams | is, | \ | A) | |
| | a) 10mg/L | b) 20mg/L | c) 25 mg/L | d) 30mg/L | |
| | Deforestation is occurring in many countries and it is therefore difficult to detect the ongoing damage. Which of the following types of remote sensing would be best guited for logating deforestation? | | | | |
| 70. | Deforestation is occu ongoing damage. W | rring in many countri hich of the following prorestation? | es and it is therefore d types of remote sen | lifficult to detect the sing would be best | |
| 70. | Deforestation is occur ongoing damage. W suited for locating de a) thermal infrared | urring in many countri Thich of the following eforestation? | es and it is therefore d ; types of remote sen | lifficult to detect the sing would be best | |
| 70. | Deforestation is occur ongoing damage. W suited for locating de a) thermal infrared c) radar | urring in many countri Thich of the following eforestation? | es and it is therefore d types of remote sen b) microvave d) color infrared | lifficult to detect the sing would be best | |
| 70. | Deforestation is occu ongoing damage. W suited for locating de a) thermal infrared c) radar | urring in many countri Thich of the following eforestation? | es and it is therefore d types of remote sen b) microvave d) color infrared | lifficult to detect the sing would be best | |
| 70. 71. | Deforestation is occu ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? | urring in many countri Thich of the following eforestation? nd longitude system (| es and it is therefore d ; types of remote sen b) microvave d) color infrared degrees, minutes, seco | lifficult to detect the sing would be best onds), 20 minutes is | |
| 70. 71. | Deforestation is occu ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? a) 1/3° | urring in many countri Thich of the following eforestation? nd longitude system (b) 1/3 hour | es and it is therefore d ; types of remote sen b) microvave d) color infrared degrees, minutes, secc c) 1/20° | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds | |
| 70.71.72. | Deforestation is occu ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? a) 1/3° An automated syste spatial data is known | urring in many countri Thich of the following eforestation? nd longitude system (b) 1/3 hour em for the capture, st | es and it is therefore d types of remote sense b) microvave d) color infrared degrees, minutes, secc c) 1/20° orage, retreival, analy | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds vsis, and display of | |
| 70. 71. 72. | Deforestation is occu ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude ar equal to what? a) 1/3° An automated syste spatial data is known a) a GPS | urring in many countri Thich of the following eforestation? nd longitude system (b) 1/3 hour em for the capture, st | es and it is therefore d types of remote senter b) microvave d) color infrared degrees, minutes, seccer c) 1/20° orage, retreival, analy b) Landsat | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds vsis, and display of | |
| 70. 71. 72. | Deforestation is occu ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? a) 1/3° An automated syste spatial data is known a) a GPS c) a GIS | arring in many countring b) 1/3 hour b) 1/3 hour cm for the capture, standard | es and it is therefore d types of remote sent b) microvave d) color infrared degrees, minutes, seco c) 1/20° orage, retreival, analy b) Landsat d) none of the above | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds vsis, and display of | |
| 70.71.72.73. | Deforestation is occu ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? a) 1/3° An automated syste spatial data is knowr a) a GPS c) a GIS Living vegetation ap | arring in many countring in many countring in many countring which of the following efforestation? and longitude system (b) 1/3 hour b) 1/3 hour cm for the capture, standard set in as pears on fals | es and it is therefore d ; types of remote sen b) microvave d) color infrared degrees, minutes, secc c) 1/20° orage, retreival, analy b) Landsat d) none of the above e-color IR images. | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds vsis, and display of | |
| 70.71.72.73. | Deforestation is occu ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? a) 1/3° An automated syste spatial data is known a) a GPS c) a GIS Living vegetation ap a) white | arring in many countriple of the following efforestation? and longitude system (b) 1/3 hour b) 1/3 hour cm for the capture, standard set in as pears on fals b) black | es and it is therefore d ; types of remote sen b) microvave d) color infrared degrees, minutes, secc c) 1/20° orage, retreival, analy b) Landsat d) none of the above e-color IR images. c) blue | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds vsis, and display of d) red | |
| 70. 71. 72. 73. 74. | Deforestation is occur ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? a) 1/3° An automated syste spatial data is known a) a GPS c) a GIS Living vegetation ap a) white Lines connecting poi | arring in many countri (hich of the following eforestation?) and longitude system (b) 1/3 hour b) 1/3 hour and for the capture, states is b) black b) black | es and it is therefore d ; types of remote sent b) microvave d) color infrared degrees, minutes, secc c) 1/20° orage, retreival, analy b) Landsat d) none of the above e-color IR images. c) blue rature are known as | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds vsis, and display of d) red | |
| 70. 71. 72. 73. 74. | Deforestation is occur ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? a) 1/3° An automated syste spatial data is known a) a GPS c) a GIS Living vegetation ap a) white Lines connecting poin a) isohytes | <pre>urring in many countri /hich of the following eforestation? nd longitude system (b) 1/3 hour em for the capture, st n as pears on fals b) black nts of equal air temper b) isotherms</pre> | es and it is therefore d ; types of remote sent b) microvave d) color infrared degrees, minutes, secc c) 1/20° orage, retreival, analy b) Landsat d) none of the above e-color IR images. c) blue rature are known as c) isobars | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds vsis, and display of d) red d) contour lines | |
| 70. 71. 72. 73. 74. 75. | Deforestation is occur ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? a) 1/3° An automated syste spatial data is known a) a GPS c) a GIS Living vegetation ap a) white Lines connecting poin a) isohytes Which of the following | <pre>urring in many countri /hich of the following eforestation? nd longitude system (b) 1/3 hour em for the capture, st n as pears on fals b) black nts of equal air temper b) isotherms ng remote sensing tech</pre> | es and it is therefore d ; types of remote sent b) microvave d) color infrared degrees, minutes, secc c) 1/20° orage, retreival, analy b) Landsat d) none of the above e-color IR images. c) blue rature are known as c) isobars mologies uses sound? | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds vsis, and display of d) red d) contour lines | |
| 70. 71. 72. 73. 74. 75. | Deforestation is occur ongoing damage. W suited for locating de a) thermal infrared c) radar Using the latitude an equal to what? a) 1/3° An automated syste spatial data is known a) a GPS c) a GIS Living vegetation ap a) white Lines connecting poir a) isohytes Which of the followin a) radar | <pre>urring in many countri /hich of the following eforestation? nd longitude system (b) 1/3 hour em for the capture, st mas pears on fals b) black nts of equal air temper b) isotherms ng remote sensing tech</pre> | es and it is therefore d ; types of remote sen b) microvave d) color infrared degrees, minutes, secc c) 1/20° orage, retreival, analy b) Landsat d) none of the above e-color IR images. c) blue rature are known as c) isobars mologies uses sound? b) color infrared image | lifficult to detect the sing would be best onds), 20 minutes is d) 200 seconds vsis, and display of d) red d) contour lines | |

| 76. | Excessive quantities the atmosphere, w | s of carbon dioxide, v vhich reflect heat l | vater vapor, methane, back onto the earth | , and nitrous oxide in n's surface is called |
|-----|---|--|--|--|
| | a) solar introspectio c) desertification | n | b) acid rain d) the greenhouse (| effect |
| 77. | Which of the follow a) Kitchen wastes c) dead plants | ing wastes cannot be o | decomposed by bacter b) Plastic and polyt d) bodies of insects | ria to form compost? thene bags living in the soil |
| 78. | Which of the following problems is not created by noise pollution ?a) Diarrhoeab) Hypertensionc) Deafnessd) Irritation | | on ? | |
| 79. | Plants are green bec a) glucose c) chlorophyll | ause of the presence c | of a pigment called: b) nitrogen d) oxygen | |
| 80. | Air is composed of a) dust particles c) snowfall | gases, water vapours a | and b) rainfall d) light | |
| 81. | If waste materials c diseases will spread a) Scurvy | ontaminate the sourc ? b) Typhoid | e of drinking water w c) Malaria | which of the following d) Anaemia |
| 82. | Medicine of quinine a) Eucalyptus plant | e is provided by b) aconite plant | c) cinchona plant | d) money plant |
| 83. | Chief source of ener a) fire | gy in environment is b) moon | c) sun | d) stars |
| 84. | When trees are cut, a) decreases | amount of oxygen b) increases | c) both a) and b) | d) remains same |
| 85. | Process through wh a) Eating | ich plants reproduce: b) Evaporation | c) Pollination | d) Condensation |
| 86. | A European concept that uses solid waste to generate electricity is calleda) mass burnb) catalytic incinerationc) energy retrievald) recycling | | v is called ation | |
| 87. | Which is not true about incineration of solid waste? a) there are drastic reductions in the volume and weight of wastes b) the ash can contain heavy metals and other toxic substances c) the incinerators are relatively cheap to build d) the incinerators can be built to generate electricity | | | |
| 88. | Animal(s) which is/ a) owl | are active at night. b) rat | c) cockroach | d) all the above |
| 89. | An animal that can a) rats | tolerate the heat of the b) camel | e desert is c) cow | d) lion |

| 90. | In the titration of a weak base with a strong acid, the pH after the equivalence point is controlled mostly by: a) hydrolysis (reaction with water) of the weak base b) the dissociation of water molecules c) the presence of excess titrant d) the presence of a small amount of weak acid in equilibrium with its salt | | | |
|------|---|--|--|--------------------|
| 91. | Which of the followin a) Reuse | ng is not related to sol b) Recycle | id waste management? c) Recovery | d) Resettlement |
| 92. | Why is sediment yield an important consideration in a discussion of water supplies? a) sediment yield affects the amount of water that is available b) water resources and sediment resources are closely intertwined c) sediment is a common water pollutant d) soil erosion restricts water flow to streams | | | |
| 93. | The boundary betwe a) watershed | en drainage basins is b) high point | called the c)basin split | d) drainage divide |
| 94. | The drainage density on clay soils is likely to have what relationship to the drainage density on gravel soils? a) greater drainage density on clay soils b) greater drainage density on gravel soils c) equal drainage density, the soil type has no effect d) greater drainage density on clay soils, but with fewer streams | | | |
| 95. | Runoff depends on a a) Soil | ny one of the followir b) Land Use | ng factors c) Slope | d) All the above |
| 96. | Carbogen is a mixtur a) CO_2 and O_2 | re of b) CO and O ₂ | c) Cl_2 and O_2 | d) He and O_2 |
| 97. | Which one has the lo a) Coal | west world wide ener b) Oil | gy consumption? c) Nuclear | d) Natural gas |
| 98. | In the titration of a weak base with a strong acid, the pH after the equivalence point is controlled mostly by: a) hydrolysis (reaction with water) of the weak base b) the dissociation of water molecules c) the presence of excess titrant d) the presence of a small amount of weak acid in equilibrium with its salt | | | |
| 99. | The desirable limit for Total Dissolved Solids in water as per I.S is a) 500ppm b) 800ppm c) 1000ppm d) 1200ppm | | | |
| 100. | What is meant by MI a) Mass Processing N c) Most Processing N | PN? Jumber Jumber | b) Most Probable Nu d) Mass Probable Nu | mber mber |
| | **** | | | |

Food Processing (Section code 11)

- 1. In ball mill, the speed at which there will be centrifugation
 - a) Operating speed
 - b) Critical speed
 - c) Normal speed
 - d) Centrifugation speed

2. ----- solids are unfloatable

- a) Hydrophilic
- b) Hydrophobic
- c) Both
- d) Hygroscopic

3. The separation of solids from suspension in liquid by gravity alone is called

- a) Centrifugation
- b) Flocculation
- c) Sedimentation
- d) Filtration
- 4. Fluid consist of
 - a) Liquids
 - b) Gases
 - c) Vapours
 - d) Both liquids and solids
- 5. The viscosity of ------ increases with temperature
 - a) Syrup
 - b) Hydrogen
 - c) Water
 - d) Milk
- 6. Tomato ketchup is good example of
 - a) Newtonian fluid
 - b) Non- Newtonian fluid
 - c) Pseuodoplastic
 - d) Both a) and b) are correct
- 7. Unit of viscosity is
 - a) Pascal
 - b) Pascal second
 - c) Pascal meter
 - d) Pascal kilogram
- 8. Cutting of food material into cubes is
 - a) Slicing
 - b) Milling
 - c) Dicing
 - d) Crystallization

- 9. Heating of food in an electrically insulating material by the losses in it when subjected to an alternating electric field is called
 - a) Plate heating
 - b) Dielectric heating
 - c) Microwave heating
 - d) Oven heating
- 10. Cold sterilization is
 - a) Sterilization by liquid nitrogen
 - b) Sterilization by ice
 - c) Sterilization by irradiation
 - d) Sterilization followed by freezing
- 11. The second law of thermodynamics states that
 - a) The energy change of a system undergoing any reversible process is zero
 - b) It is not possible to transfer heat from a lower temperature to higher temperature
 - c) The total energy of the system and surroundings remains constant
 - d) There will not be any energy change
- 12. Heat transfer occurs by natural convection because change in temperature causes difference in
 - a) Viscosity
 - b) Thermal conductivity
 - c) Heat capacity
 - d) Density
- 13. The most widely used coagulant for removing suspended impurities from water is
 - a) Alum
 - b) Bleaching powder
 - c) Chlorine
 - d) Calcium chloride
- 14. Which one of the following is not likely to be constituent of vegetable oil?
 - a) Oleic acid
 - b) Stearic acid
 - c) Citric acid
 - d) Glycerol
- 15. Entropy of a substance at 0 K temperature is its
 - a) Zero
 - b) Infinity
 - c) Very high but not infinity
 - d) Very low but not zero
- 16. First law of thermodynamics relates with the conversion of
 - a) Heat
 - b) Energy

- c) Momentum
- d) Temperature
- 17. Compressor in a vapour compressor system is
 - a) Essential part
 - b) Optional part
 - c) There is a compressor in a compressor
 - d) Safety device
- 18. Bacterial cells shows maximum resistance against the heat during
 - a) Logrithmic pahse
 - b) Lag pahse
 - c) Late lag phase
 - d) Decline phase
- 19. Heat resistant mold present in canned fruits is
 - a) Clostridium botulinum
 - b) Bysoochlamys fulva
 - c) Penicillium notatum
 - d) Aspergillus niger
- 20. Father of canning is
 - a) Nicholas Appert
 - b) Peter Durand
 - c) Louis Pasteur
 - d) Alexander Fleming
- 21. Which of the following can be used for the preservation of breads and baked goods?
 - a) Nitrates
 - b) Propionates
 - c) Benzoates
 - d) Sugar
- 22. Which of the following vitamins is / are affected by irradiation?
 - a) Vitamin B
 - b) Vitamin C
 - c) Vitamin B and C
 - d) Vitamin B1
- 23. Storage of food under reduced pressure is called
 - a) Hypobaric packaging
 - b) Aseptic packaging
 - c) Hyperbaric packaging
 - d) Gas packaging
- 24. In the preparation of sugar syrup, citric acid is added for
 - a) The prevention of the growth of mold
 - b) The inversion of sugar
 - c) The generation of fruity flavor
 - d) The removal of unwanted impurities present sugar.
- 25. Boiling of water will lead to of water
 - a) Sterilization
 - b) Pasteurization
 - c) Disinfection
 - d) Hydration

- 26. The time and temperature used for the pasteurization of milk is
 - a) 72° C / 15 min
 - b) 72 °C / 15 sec
 - c) 72 °C / 30 min
 - d) 72 °C / 30 sec.
- 27. pH range of high acid food is
 - a) 5.3 7
 - b) 6.5 7.8
 - c) 7 8.5
 - d) Below 3.7
- 28. Canned food should be stored in the
 - a) Kitchen
 - b) Dry food store
 - c) Refrigerator
 - d) Deep freezer
- 29. In slow freezing
 - a) Crystal size is big
 - b) Crystal size is small
 - c) Both extra cellular and intra cellular crystallization takes place
 - d) Quality of product is better than fat cooling
- 30. In dehyrofreezing, product to be frozen is first
 - a) Blanched
 - b) Sterilized
 - c) Dehydrated
 - d) Pasteurized
 - Major source of antifreeze protein is
 - a) Tuber
 - b) Spinach
 - c) Fish
 - d) Papaya
- 32. Nisin is a

31.

- a) Narrow spectrum antibiotic
- b) Wide spectrum antibiotic
- c) Stabilizer
- d) Nutrient supplement
- 33. Sorbic acid is mostly used as preservatives in which of the following food product?
 - a) Meat
 - b) Milk
 - c) Baked product
 - d) Cenfectionary product
- 34. Which of the following is / are not biological antioxidant?
 - a) Glucose oxidase
 - b) Peroxidase dimurtase
 - c) Glutathione peroxidase
 - d) Amylase
- 35. Hydrogen peroxide is used as the preservative in which of the following
 - a) Milk
 - b) Meat
- c) Bread
- d) Confectionary
- 36. Which is found in carbonated non-alcoholic beverages?
 - a) Propionic acid
 - b) Acetic acid
 - c) Citric acid
 - d) Phosphoric acid
- 37. Which of the following compounds acts as both synergists and antioxidants?
 - a) Ascorbic acid
 - b) Citric acid
 - c) Phosphoric acid
 - d) Tartaric acid
- 38. compound present garlic have antimicrobial effect
 - a) Allicin
 - b) Allyl isothiocyanate
 - c) Methyl sulphate
 - d) Garlic acid
- 39. Protein is many fold sweeter than sucrose
 - a) Casein
 - b) Monelin
 - c) Allicin
 - d) Nisin
- 40. ------ salt of saccharine is mainly used as sweetner.
 - a) Calcium
 - b) Potassium
 - c) Magnesium
 - d) Sodium
- 41. Anticaking agents are
 - a) Those used to destroy the cake while disposing the spoiled cakes
 - b) Those used to maintain the free flowing nature of granular or powdered products.
 - c) Those used to kill microorganisms growing in cakes
 - d) Those used to maintain the shape of the cakes and pastries
- 42. Monosodium glutamate is mostly used as
 - a) Artificial sweetner
 - b) Anticaking agent
 - c) Flavor enhancer
 - d) Cleaning agent
- 43. Lemon extract can be preserved by using
 - a) Alcohol
 - b) Formaldehyde
 - c) Acetic acid
 - d) Formic acid
- 44. Vinegar is used as the preservative in
 - a) Confectionary
 - b) Ketchup
 - c) Jelly
 - d) Oils

- 45. Process which is responsible for the preservative nature of sugar is
 - a) Osmosis
 - b) Reverse osmosis
 - c) Chelation
 - d) Toxicity
- 46. Baking powder is used in baking as
 - a) Antimicrobial agent
 - b) Anticaking agent
 - c) Leavening agent
 - d) Stabilizing agent
- 47. One third of amino acids in gluten is
 - a) Leucine
 - b) Lysine
 - c) Methionine
 - d) Glutamine
- 48. Of the following compound acts as antioxidant
 - a) Malic acid
 - b) Pectin
 - c) Vitamin C
 - d) Amylase
- 49. Which of the following methods is generally employed to retain maximum flavor
 - a) Low temperature vacuum processing
 - b) High temperature short time processing
 - c) Low temperature high time processing
 - d) High temperature vacuum processing
- 50. ----- fruit is climacteric
 - a) Apple
 - b) Banana
 - c) Melon
 - d) All the above
- 51. Find out the reducing sugar
 - a) Sucrose
 - b) Trehalose
 - c) Gluconate
 - d) Maltose
- 52. Non- enzymic browning reaction occurring between
 - a) Phenolic compounds and PPO
 - b) Lipids and carbohydrates
 - c) Reducing sugars and amino acids
 - d) Lipids and proteins
- 53. Xanthan, the polysaccharide, stabilizing agent is derived from
 - a) Fungus
 - b) Algae
 - c) Fern
 - d) Bacterium
- 54. Starch modification is done to
 - a) Increase the cohesiveness of starch
 - b) Withstand the high temperature during processing

- c) Improve the gelling property of starch
- d) Make soft gel
- 55. High Fructose Corn Syrup, sweeter of soft drink comprised major portion of
 - a) Ribose
 - b) L-fructose
 - c) D fructose
 - d) Mannose
- 56. Sulphur containing essential amino acids are
 - a) Cysteine and methionine
 - b) Tyrosine and phenylalanine
 - c) Asparagine and tryptophan
 - d) Proline and glutamine
- 57. Albumin fraction of protein is present in high concentration in
 - a) Wheat
 - b) Rice
 - c) Gelatin
 - d) Egg yolk and milk
- 58. The following is a non-protein amino acid
 - a) Histamine
 - b) Cysteine
 - c) Alanine
 - d) Tyrosine
- 59. Find out ω 3 fatty acid.
 - a) Eicosa pentaenoic acid
 - b) Oleic acid
 - c) Linoleic acid
 - d) Stearic acid
- 60. is dietary antioxidant widely used in fat and oil industries
 - a) BHT (Butylated Hydroxy Toluene)
 - b) BHA (Butylated Hydroxy Anisole)
 - c) Tocopehrol
 - d) Tertiary Butyl Hydroquinone (TBH)
- 61. FFDCA stands for
 - a) Food Flavour Development and Control Authority
 - b) Food Flavourants and Drug Control Act
 - c) Federal Food Drug and Cosmetic Act
 - d) Federation of Food and Drug Control Agency
- 62. Rancidity is due to
 - a) Lipolysis followed by the release of short chain fatty acids
 - b) Hydrogenation of free fatty acids
 - c) Interesterification
 - d) Saponification which causes undesirable flavor
- 63. Racemization of protein can be done by
 - a) Desulfuration
 - b) Deamination
 - c) Acid and /or alkaline hydrolysis
 - d) Protein cross linking
- 64. Kunits and Bowman-Birk type inhibitors are
 - a) α amylase inhibitors

- b) Invertase inhibitors
- c) Phytate inhibitors
- d) Protease inhibitors
- 65. Activated carbon is used in oil processing for
 - a) Degumming
 - b) Waxing
 - c) Bleaching
 - d) Hydrogenation
- 66. Glycolysis is the name given to the following pathway involving the conversion of
 - a) Glycogen to glucose 6 phosphate
 - b) Glycogen to glucose to pyruvate or acetyl CoA
 - c) Glycogen to pyruvate
 - d) Glucose to pyruvate or lactate
- 67. α amylases hydrolyses
 - a) α 1-4 g;ycosidic bonds
 - b) Ester bonds
 - c) Peptide linkages
 - d) β 1-4 glycosidic linkages
- 68. GM food is
 - a) Gene modified food
 - b) Gene multiplied food
 - c) Genesis modified food
 - d) Genetically modified food
- 69. Enzyme that coagulate milk
 - a) Rennet
 - b) Casein
 - c) Lactose
 - d) Catalase
- 70. Legumes are rich in and -----amino acids
 - a) Lysine and arginine
 - b) Cysteine and mehionines
 - c) Phenylalanine and tyrosine
 - d) Glycine and glutamine
- 71. Dietary fiber is an indigestible that serves separately as body regulatory agent
 - a) Fat
 - b) Protein
 - c) Carbohydrate
 - d) Amino acid
- 72. is the body's primary source of energy
 - a) Fructose
 - b) Glucose
 - c) Sucrose
 - d) Galactose
- 73. Less than percent of Kcal should be from saturated fat
 - a) 20
 - b) 35
 - c) 10

d) 25

- 74. Which of the following pigments is present in a mature tomato?a) Chlorophyll
 - b) Lycopene
 - c) Bixin
 - d) Anthocyanin
- 75. Inactivation of enzymes during blanching is due to prevent
 - a) Loss of nutrient
 - b) Loss of acidity
 - c) Loss of pectin
 - d) Browning reaction
- 76. Foaming nature of protein is
 - a) Maximum at isoelectric pH
 - b) Maximum at alkaline pH
 - c) Maximum at acidic pH
 - d) Maximum at neutral pH
- 77. Sourkraut is the
 - a) Fermented radish
 - b) Fermented carrot
 - c) Fermented cabbage
 - d) Fermented spinach
- 78. Wax coating of fruits is done to reduce
 - a) Total soluble solids
 - b) Rate of transpiration
 - c) Surface glossy appearance
 - d) Excess nutrients
- 79. The enzyme papain is obtained from
 - a) Papaya
 - b) Pine apple
 - c) Pomegranate
 - d) Pear
- 80. fruit is rich in lipids
 - a) Mango
 - b) Sweet orange
 - c) Avocado
 - d) Banana
- 81.aspects of milk decides its market price
 - a) Fat content
 - b) Iron
 - c) Copper
 - d) Solid contents
- 82. pH of the normal and fresh cow milk is
 - a) 6.1
 - b) 6.2
 - c) 6.6
 - d) 6.8
- 83. SNF content of buffalo milk is
 - a) 9%
 - b) 5%

- c) 7%
- d) 13%
- 84. The only carbohydrate present in milk is
 - a) Maltose
 - b) Lactose
 - c) Sucrose
 - d) Glucose
- 85. The father of white revolution is
 - a) Dr. M. Kurien
 - b) Dr. V. Kurien
 - c) Dr. S. Kurien
 - d) Dr. A. Kurien
- 86. Cured meats are called as
 - a) Beef
 - b) Ham
 - c) Marinades
 - d) Bacon
- 87. Poor quality of egg floats in the water due to
 - a) Microbial spoilage
 - b) Increase in air cell
 - c) Decrease in air cell
 - d) Air cell has no relation to quality of egg.
- 88. Lard is obtained from
 - a) Coconut
 - b) Hogs
 - c) Soybean
 - d) Beef
- 89. Which of the following is not a cereal?
 - a) Wheat
 - b) Sugar cane
 - c) Barley
 - d) Maize
- 90. The soybean was first cultivated in
 - a) Germany
 - b) USA
 - c) India
 - d) Chinas
- 91. The scientific name of wheat is
 - a) Oryza sativa
 - b) Medicago sativa
 - c) Triticum aestivum
 - d) Zea mais
- 92. Cow's milk is deficient in
 - a) Iron
 - b) Water
 - c) Calcium
 - d) Phosphorous
- 93. The major role of minor elements inside the organism is to play as
 - a) Building block of important amino acids

- b) Constituent of hormones
- c) Co –factor of enzyme
- d) Binders of cell structure
- 94. Pellagra is due to low intake of
 - a) Protein
 - b) Vitamin A
 - c) Niacin
 - d) Vitamin B₁₂

95. vitamin is required for blood coagulation

- a) Vitamin K
- b) Vitamin B₁₂
- c) Vitamin C
- d) Vitamin E
- 96. World Food Day is celebrated on
 - a) 15th March
 - b) 20th June
 - c) 25th September
 - d) 16th October

97. Amino acid limiting in cereals is

- a) Methionine
 - b) Lysine
 - c) Leucine
 - d) Tyrosine
- 98. The RDA of iron for lactating mother
 - a) 30mg / day
 - b) 38mg / day
 - c) 28mg / day
 - d) 40mg / day
- 99. BMI can be abbreviated as ----
 - a) Bone Material index
 - b) Bone Mass Index
 - c) Body Mass Index
 - d) Body Material Index
- 100. Trypsin enzyme pancreatic Fluid helps in the digestion of
 - a) Protein
 - b) Carotene
 - c) Fat
 - d) Vitamins

Materials Science (Section code 12)

1. Find the work done by a constant force $\overline{F} = 2\hat{i} + 4\hat{j}$, if its point of application to a block moves from A(1,1) to B(4,6)

2. If $u(x, y) = x^3 - 3xy^2 - 5y$, then its harmonic conjugate function is

a)
$$3x^2y - y^3 + c$$

b) $3x^2y - y^3 + 5x + c$
c) $3x^2y - y^2 - 5x + c$
d) $3xy^2 - y^3 + 5x + c$

3. The particular integral of $(D^2 - 4D + 3)y = \sin 3x$, $\left(where D \equiv \frac{d}{dx}\right)$ is

a)
$$\frac{1}{30}(\cos 3x - \sin 3x)$$

b) $\frac{1}{30}(2\cos 3x + \sin 3x)$
c) $\frac{1}{30}(2\cos 3x - \sin 3x)$
d) $\frac{1}{30}(\cos 3x - \sin 3x)$

4. The root of the equation $x^3 - 4x - 9 = 0$, (using the bisection method in 4 stages) is

5. if
$$F = (3x^2 - 3yz)\hat{\imath} + (3y^2 - 3zx)\hat{\jmath} + (3z^2 - 3xy)\hat{k}$$
, then divF is
a) $6(x+y+z)$ b) $6(x-y-z)$ c) $3(x+y+z)$ d) $2(x+y+z)$

6. If X is a poisson variate such that
$$P(X=1)=\frac{3}{10}$$
 and $P(X=2)=\frac{1}{5}$, find λ
a) $\frac{3}{4}$ b) $\frac{3}{2}$ c) $\frac{4}{3}$ d) $\frac{1}{4}$

7. If
$$A+B=\begin{pmatrix} 1 & -1 \\ 0 & -3 \end{pmatrix}$$
 and $A-B\begin{pmatrix} 3 & 1 \\ 1 & 4 \end{pmatrix}$, then the product AB is

a)
$$\begin{pmatrix} -1 & -1 \\ 0 & -3 \end{pmatrix}$$
 b) $\begin{pmatrix} 0 & -1 \\ -1 & -3 \end{pmatrix}$ c) $\begin{pmatrix} 0 & -6 \\ -2 & -2 \end{pmatrix}$ d) $\begin{pmatrix} -2 & -2 \\ 0 & -6 \end{pmatrix}$

8. The value of
$$\int_0^{\frac{\pi}{2}} \cos^6 x \, dx$$
 is

a)
$$\frac{3\pi}{32}$$
 b) $\frac{4\pi}{15}$ c) $\frac{5\pi}{32}$ d) $\frac{\pi}{32}$

9. Find the points at which the function $f(z) = \frac{z}{z^2 - 1}$ is not analytic.

a)
$$z = \pm 1$$
 b) $z = \pm 2$ c) $z = 1$ d) $z = -1$

10. If
$$x = a (\cos t + t \sin t)$$
, $y = a (\sin t - t \cos t)$, find $\frac{dy}{dx}$

| 11. The total wave function of a system of identical to interchange of any two particle | | | ntical fermions is | with respect | |
|--|---|---|--|---------------------|--|
| | a) antisymmetric | | b) symmetric | | |
| | c) Hermitian | | c) skew symmetric | | |
| 12. | For a spherical syn quantum number is z | nmetric probability zero | cloud of an electron | , the | |
| | a) principal | | b) orbital | | |
| | c) spin | | d) magnetic orbital | l | |
| 13. | The wave function of a) sine function | a particle in a classica | ally forbidden region is b) cosine function | a | |
| | c) positive exponen | tial | d) negative expone | ntial | |
| 14. | A particle is moving in a coulomb potential. An operator A commutes w Hamiltonian of the system. The observable corresponding to A is | | | A commutes with | |
| | a) position $(1, 1, 1)$ | | b) linear momentur | n | |
| | c) kinetic energy | | d) angular moment | um | |
| 15. | The possible values two angular moment | of total angular more $J_1=1$ and $J_2=2$ are | nentum J resulting f | rom the addition of | |
| | a) 1,2 | b) 1,3 | c) 0,1,2 | d) 1,2,3 | |
| 16. The quantization condition for the electron wave is that a) the value of wave function φ must not be discontinuous b) the value of $\frac{\partial \varphi}{\partial x}$ must not be discontinuous | | | | | |
| | c) the value of φ and $\frac{\partial \varphi}{\partial x}$ must be discontinuous | | | | |
| | d) the value of $\frac{1}{\partial x}$ | and $\frac{1}{\partial x^2}$ must be cor | ltinuous | | |
| 17. | The eigen value of He | ermitian operators are | , | | |
| | a) imaginary c) real | | b) indeterminate d) zero | | |
| 18. | If an operator commu | ites with a Hamiltonia | an, then the operator is | 5 | |
| | a) constant of motion | | b) dependent on time | | |
| | c) partially time independent d) none of the above | | | | |
| 19. | The parity of wave f | unction $\varphi(x) = e^{-xa^2}$ is | | | |
| | a) odd | _ | b) even | | |
| | c) partly odd and p | artly even | d) nil | | |
| 20. | The zero point energy of harmonic oscillator is a consequence of | | | | |
| | a) uncertainty princ | ciple | b) correspondence | principle | |
| | c) Hamilton princi | pie | a) none of the abov | e | |
| 21. | The ratio of the volu lattice is | ame of atoms to the | total volume availabl | e in a simple cubic | |
| | a) 74% | b) 66% | c) 52% | d) 34% | |

| 22. | A dielectric material has non –uniform polarization \vec{p} .The polarization volume charge density is given by | | | | |
|-----|--|---|--|--|--|
| | a) $ \vec{p} ^2$ | b) $\frac{ p }{\varepsilon}$ | c) $\overrightarrow{\nabla} \cdot \overrightarrow{p}$ | d) $-\overrightarrow{\nabla}\cdot\overrightarrow{p}$ | |
| 23. | Madelung energy is a) ionic crystals c) metals | the main contribution | to the binding energy b) covalent crystals d) inert gas solids | of | |
| 24. | The packing fraction a) 0.74 | of a simple cubic crys b) 0.68 | tal lattice is approxima c) 0.52 | tely d) 0.32 | |
| 25. | The characteristic fea a) a partly filled va c) an unfilled outer | ture of the transition e lance shell shell | element is b) an empty inner s d) a partly filled ini | hell ner shell | |
| 26. | The number of atoms a) 4 | s per unit cell in the cu b) 6 | bic diamond is c) 7 | d) 8 | |
| 27. | The conductivity of a pure semiconductor is a) proportional to temperature b) rises exponentially with temperature c) decrease exponentially with increasing temperature d) independent of temperature | | | | |
| 28. | The slope of the grap a) $-\frac{Eg}{2K}$ | b) $\frac{Eg}{2K}$ | procal temperature, in c) $\frac{Eg}{K}$ | a semiconductor is d) $\frac{KT}{Kg}$ | |
| 29. | A certain capacitor h with a plastic betwee a) 74 | as a capacitance of 50 en its plates. The dielec b) 7.4 | pF with air between it tric constants of the p c) 0.012 | s plates and 370 pF lastic is d) 0.12 | |
| 30. | An element can form a strongly magnetic s a) an incomplete valance shell c) a vacant inner shell | | solid only if it its atom has b) an incomplete inner shell d) a complete valence shell | | |
| 31. | The critical current d a) <i>H</i> and <i>T</i> | ensity J _c in supercond b) H only | uctors is a function of c) <i>T</i> only | d) E and T | |
| 32. | The energy of a spir called as | n wave is quantized a | nd the unit of energy | y of a spin wave is | |
| 33. | The critical magnetic a) temperature | a) phononb) rotonc) magnond) photonThe critical magnetic field <i>Hc</i> required to destroy superconductivity is a function ofa) temperatureb) pressurec) volumed) electric fields | | | |
| 34. | A superconductor ex a)zero conductivity c) infinite conductiv | hibits vity | b) infinite resistivit d) paramagnetism | y | |

| 35. | When a metal unde a) increases c) remains same | ergoes the superconduc | ivity transition, thermoelectricity b) decreases d) vanishes | | |
|-----|--|--|--|---|--|
| 36. | A superconductor is a perfect diamagnet, w a) DC Josephson effect c) Messiner effect | | with the magnetic indu b) superconductor d) AC Josephson e | vith the magnetic induction <i>B</i> =0.this is b) superconductor tunnelling d) AC Josephson effect | |
| 37. | The critical magne which can flow th 10 ⁻³ metre is | The critical magnetic field for aluminium is 7.9×10^3 amp/metre the critical current which can flow through a thin long aluminium superconducting wire of diameter 10^{-3} metre is | | | |
| | a) 20.806 amp c) 24.806 amp | | b) 21.806 amp d) 23.806 amp | | |
| 38. | Magnetic flux thro charge is | ugh a superconductin | g ring is quantized a | nd the effective unit | |
| | a) <i>e</i> | b) 2 <i>e</i> | c) 3e | d) 4e | |
| 39. | The space lattice of a) hcp | f caesium chloride strue b) bcc | cture is c) fcc | d) scc | |
| 40. | Superionic conductor are generally formed witha) electrovalent bondingb) covalent bondingc) homopolar bondingd) metallic bonding | | | g | |
| 41. | According to the optical theorem at limiting distance a) the dimension of scatterer and shadow are independent of each other b) the dimension of the shadow is very much larger than that of the scatterer c) the dimension of the shadow is very much smaller than that of the scatterer d) the dimension of the shadow and scatterer are of the same order | | | | |
| 42. | The plane of polarization of a light beam travelling from one end of a Polaroid to the other end undergoes a rotation θ . It the beam is now reflected and reaches the original end along the same path, the resultant rotation is | | | | |
| | | | -, - | | |
| 43. | Attenuation of inte a) C_2H_2 | nsities is observed in th b) HBr | e rotation- vibration s c) CO ₂ | pectrum of d) N ₂ O | |
| 44. | Which of the following is optically active ?a) stretched polymer sheetb) calcitec) silvered glassd) quartz | | | | |
| 45. | In the He-Ne laser the role of the He atom is a) to emit the red light b) to control the output c) to control the wavelength d) to effect population inversion between the Ne levels | | | | |

| 46. | The spectroscopic phenomenon which led to the discovery of heavy hydrogen is a) Zeeman effect b) Stark effect | | | | | |
|---|--|---|-----------------------------|------------------------------|--|--|
| | c) nuclear spin h | yperfine structure | d) isotope effec | ct | | |
| 47. | Black hole refers t | 0 | | | | |
| | a) holes in the he | eavenly bodies | b) Sun spots | | | |
| | c) collapsing obj | ects of low density | d) collapsing o | bjects of high density | | |
| 48. | The value of Bohr | magneton m_B is | 24 | | | |
| | a) 9.27×10^{-24} J/T | | b) 92.7×10^{-24} | J/T | | |
| | c) $0.927 \times 10^{-24} \text{ J/T}$ | | d) 927× 10 ²⁴ J/ | d) 927× 10 ²⁴ J/T | | |
| 49. | Fringes in the Mic a) circular reflec | chelson interferometer a tors are used | are circular because | | | |
| | b) they are tring | es of equal inclination | 1 | | | |
| | c) fringes of equ | al thickness | | | | |
| | d) light is emitte | d as spherical waves | | | | |
| 50. A spring of force constant K is cut into three equal parts. Then the each part is | | | | en the force constant of | | |
| | a) K | b) K/3 | c) 3K | d) 3K ² | | |
| 51. | Which of the follo | wing gates is not availa | able as an IC? | | | |
| | a) Inverter | b) XOR | c) XNOR | d) NOR | | |
| 52. | A counter which counts the sequence 1000,0100,0010,0001,1000 is called | | | | | |
| | a) Down counter | r | b) Up-converte | er | | |
| | c) Johonson counter d) Up-down counter | | | ounter | | |
| 53. | The minimum nu | mber of gates required | to build a half adde | r is | | |
| | a) 1 | b) 2 | c) 3 | d) 4 | | |
| 54. | The fastest <i>A</i> to <i>D</i> converter is | | | | | |
| | a) Simultaneous converter | | b) counter type | b) counter type converter | | |
| | c) single – slope converter d) dual -slope converter | | | converter | | |
| 55. | The ratio the high converter convert | nest to lower resistance ing 8 bits input is | e value in a resistive | e ladder digital to analog | | |
| | a) 2 | b) 8 | c) 128 | d) 256 | | |
| 56. | The length of the instruction register in 8085 is | | | | | |
| | a) 8 bit | | b) 16 bit | b) 16 bit | | |
| | c) 24 bit | | d) none of the | d) none of the above | | |
| 57. | The instruction w | hich reset the carry flag | ; in 8085 microproce | essor is | | |
| | a) STC | b) CMC | c) ADD A | d) ANA A | | |
| 58. The advantages of LCD over LED is | | | | | | |
| | a) high persister | nce | b) low power c | consumption | | |
| | c) fast operation | | d) none of the | d) none of the above | | |

| 59. | The main disadvanta | age in using an op-amp | p is b) its drift | | |
|-----|--|---|---|---|--|
| | c) its input impeda | nce | d) its offset voltage | e | |
| 60. | An op-amp filter circuit uses a) resistor and capacitors but not inductors b) inductor and capacitor but not resistors c) resistor, capacitor and inductors d) only resistor but not inductor or capacitors. | | | | |
| 61. | A material is sintered by a) placing in the middle b) finely dividing the solid c) sieving to achieve uniform particle size d) heating the finely divided solid to a high temperature under pressure | | | | |
| 62. | The material first | shown to exhibit wh | nat we now call su | perconductivity was | |
| | a) a thin film | b) a ceramic | c) a polymer | d) a metal | |
| 63. | Of the following, only is an addition polymer. a) polyethylene terephthalate b) polystyrene c) polyurethane d) polycarbonate | | | | |
| 64. | An elastomer will fail to regain its original dimensions following a distortion beyond its | | | | |
| | a) glass transition | b) phase boundary | c) London force | d) elastic limit | |
| 65. | The monomer that is a) melamine | polymerized to make b) formaldehyde | natural rubber is c) ethylene | d) isoprene | |
| 66. | Cholesteric liquid crystals are colored because a) each molecule is a chromophore b) of the slight twist between layers c) of the large spacing between layers d) of the large number of conjugated bonds | | | | |
| 67. | For a given substance state exists a) at one particular b) in a range of tem c) at one particular | e that exhibits liquid-o temperature below peratures below the temperature above t | crystalline properties, the melting point of melting point of the the melting point of | the liquid-crystalline the solid e solid the solid | |

d) in a range of temperatures above the melting point of the solid

| 68. | Molecules with only properties because | single bonds do | not generally exhib | it liquid-crystalline | |
|-----|--|---|---------------------------------|--------------------------------|--|
| | a) molecules without multiple bonds lack the rigidity necessary for alignment b) molecules without multiple bonds are too small to exhibit liquid-crystalline properties c) molecules with only single bonds are gases d) molecules with only single bonds are too big to exhibit liquid-crystalline properties | | | | |
| 69. | Who photographed na a) Sumio Tijima k | notubes for the first)Tanigchi | time ? c)Feynmann | d)Drexler | |
| 70. | In a bucky ball, each ca a)1 b | rbon atom is bound)2 | to adjacent carb c)3 | oon atoms. d)4 | |
| 71. | The size of red and white a)2-5 b | ite blood cells is in tl b)5-7 | he range ofµm. c)7-10 | d)10-15 | |
| 72. | A healthy diet needs a a a)fibre b | balance of many thin)carbohydrates | ngs. Which is a main s c)fat | ource of energy? d)vitamins | |
| 73. | What is a mutation? a)a change in a gene or chromosome b) a condition caused by a recessive allele c) a process used in genetic engineering d) a type of discontinuous variation | | | | |
| 74. | Which structure contain a)the cell membrane of b) the cytoplasm of an a c) the nucleus of a plan d) the vacuole of a plan | ns genes? f an animal cell animal cell t cell tt cell | | | |
| 75. | Of the following biolog lowest level? a)organs | ical levels of organiz | zation, which represer | ts the smallest or | |
| 76. | According to the fos | ssil record, how r | nany times has flig | ht evolved among | |
| | a)1 b | <i>b</i>)2 | c)3 | d)4 | |
| 77. | Which of the following a) the front leg of a ho b) the front leg of a fr c) the wing of a bird a d) the wing of a bird a | pairs are analogous orse and a human og and a bat wing and a bat wing and a bat wing and a butterfly win | structures? arm ng | | |

| 78. | Structures that have the same evolutionary origin even though they may nov different structures or functions are said to be | | | | | |
|-----|---|--|--|------------------------|--|--|
| | a) endemic | b) analogous | c)homologous | d) immutable | | |
| 79. | one generation to the | | | | | |
| | a)ecology | b)genetics | c)cell biology | d)analogy | | |
| 80. | Which of the follow a) fossil evidence t b) closely related s c)belief that the ear d) evidence of artif | Which of the following did not help Darwin formulate his theory of evolution? a) fossil evidence that species had changed over time b) closely related species on oceanic islands c)belief that the earth was several thousand years old d) evidence of artificial selection in domestic animals | | | | |
| 81. | Which of the follow a) Strain gauge | ving is a digital transc b) Encoder | lucer? c) Thermistor | d) LVDT | | |
| 82. | Strain gauge, LVDT and thermocouple are examples ofa) Active transducersb) Passive transducersc) Analog transducersd) Primary transducers | | | cers Icers | | |
| 83. | An inverse transducer is a device which converts a) An electrical quantity into a non electrical quantity b) Electrical quantity into mechanical quantity c) Electrical energy into thermal energy d) Electrical energy into light energy | | | | | |
| 84. | A strain gauge is a passive transducer and is employed for converting a) Mechanical displacement into a change of resistance b) Pressure into a change of resistance c) Force into a displacement d) Pressure into displacement | | | | | |
| 85. | Resolution of a tran a) Material of wire c) Diameter of wire | nsducer depends on e | b) Length of wire d) Excitation voltag | ge | | |
| 86. | The sensitivity fact a) 1 to 1.5 | or of strain gauge is n b) 1.5 to 2.0 | ormally of the order of c) 0.5 to 1.0 | d) 5 to 10 | | |
| 87. | In wire wound stra a) Change in diam c) Change in both l | hin gauges, the change eter of the wire length and diameter | e in resistance is due to b) Change in lengt d) Change in resist | h of the wire ivity | | |
| 88. | Bonded wire strain gauges are a) Exclusively used for construction of transducers b) Exclusively used for stress analysis c) Used for both stress analysis and construction of transducer d) Pressure measurement | | | | | |

| 89. Certain type of materials generates an electrostatic charge or voltage with mechanical force is applied across them. Such materials are called | | | | tage when d | |
|--|--|---|---|--------------------|--|
| | a) Piezo-electric | b) Photo-electric | c) Thermo-electric | d) Photo-resistive | |
| 90. | Quartz and Rochelle a) Natural group c) Natural or Synthet | salt belongs to tic group | of piezo-electric b) Synthetic group d) Fiber group | c materials | |
| 91. | Piezo-electric transdr a) Passive transducer c) Digital transducer | ucers are rs s | b) Inverse transduce d) Pulse transducers | ers S | |
| 92. | Piezo – electric trans a) Mechanical force | ducers work when we b) Vibrations | apply c) Illuminations | to it. d) Heat | |
| 93. | Piezo electric crystal can produce an emf a) When external mechanical force is applied to it b) When radiant energy stimulates the crystal c) When external magnetic field is applied d) When the junction of two such crystals are heated | | | | |
| 94. | The draw backs of st S1: Low fatigue life S2: They are expensive S3: Poor linearity a) S1 and S2 | rain gauges are ve, brittle and sensitiv b) S2 and S3 | e to temperature | d) S1 only | |
| 95. | LVDT windings are | wound on b) Aluminium | c) Ferrite | d) Copper | |
| 96. | The size of air cored | transducers in compa | rison to the iron core I | parts is | |
| | a) Smaller | b) Larger | c) Same | d) Unpredictable | |
| 97. | The principle of oper a) Self inductance c) Reluctance | ration of LVDT is base | d on the variation of b) Mutual inductand d) Permanence | ce | |
| 98. | LVDT is an/a a) Magneto-strict ion c) Resistive | transducer | b) Inductive d) Eddy current | | |
| 99. | Direct Wafer bonding involves permanent bonding of silicon wafers without :a) Electric fieldb) Magnetic fieldc) Currentd) Gravity | | | fers without : | |
| 100. | Most sophisticated n a) LIGA | nicromolding techniqu b) GIGA ******** | te is termed as: c) MIGA | d) NIGA | |