INVENTORS™ Education Pvt. Ltd.
JEE | NEET | NTSE | KVPY | OLYMPIADS

I-SAT INVENTORS SCHOLARSHIP CUM ABILITY TEST

SAMPLE PAPER

FOR CLASS

12th Pass Students

STREAM : [ENGINEERING]

TIME : 2 Hours | **FULL MARKS : 300**

INSTRUCTIONS

[A] General

1. This Question paper contains THREE Parts, A, B and C (Physics, Chemistry, and Mathematics).
2. This Question Paper contains 15 pages including cover page.
3. This question paper contains 75 questions. Each subject have 25 single choice answer type questions).
4. The Question Paper has blank spaces at the bottom of each page for rough work. No additional sheets will be provided for rough work.
5. Blank papers, clip boards, log tables, slide rule, calculators, cellular phones, pagers and electronic gadgets, in any form, are NOT allowed.
6. The OMR (Optical Mark Recognition) sheet shall be provided separately.

[B] Answering on the OMR

7. In all the parts, each question will have 4 choices out of which only one choice is correct.
8. Darken the bubble with Ball Pen (Blue or Black) ONLY.

[C] Filling OMR

9. On the OMR sheet, fill all the details properly and completely, otherwise your OMR will not be checked.
10. Do not write anything or tamper the barcode in the registration no. box.

[D] Marking Scheme:

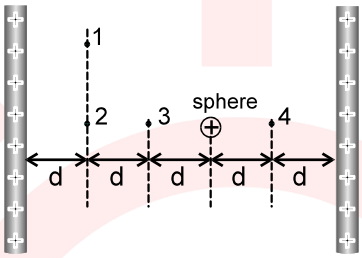
11. For each question you will be awarded 4 marks if you darken the bubble corresponding to the correct answer ONLY and zero (0) marks if no bubble is darkened. In all other cases, minus one (–1) mark will be awarded.

Name :.....

Registration No.: | | | | | | | | | | | | | | |

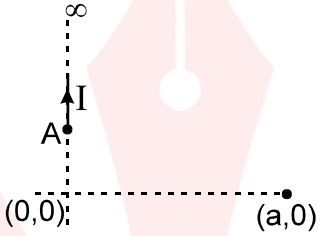
SECTION – A : PHYSICS

1. The figure shows two large, closely placed, parallel, nonconducting sheets with identical (positive) uniform surface charge densities, and a sphere with a uniform (positive) volume charge density. Four points marked as 1, 2, 3 and 4 are shown in the space in between. If E_1, E_2, E_3 and E_4 are magnitude of net electric fields at these points respectively then :



(A) $E_1 > E_2 > E_3 > E_4$ (B) $E_1 > E_2 > E_3 = E_4$ (C) $E_3 = E_4 > E_2 > E_1$ (D) $E_1 = E_2 = E_3 = E_4$

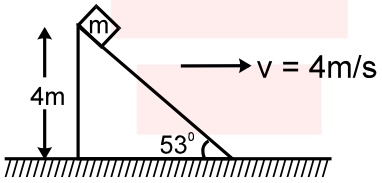
2. An infinitely long wire carrying current I is along Y axis such that its one end is at point A (0, b) while the wire extends upto $+\infty$. The magnitude of magnetic field strength at point (a, 0)



(A) $\frac{\mu_0 I}{4\pi a}\left(1+\frac{b}{\sqrt{a^2+b^2}}\right)$ (B) $\frac{\mu_0 I}{4\pi a}\left(1-\frac{b}{\sqrt{a^2+b^2}}\right)$

(C) $\frac{\mu_0 I}{4\pi a}\left(\frac{b}{\sqrt{a^2+b^2}}\right)$ (D) None of these

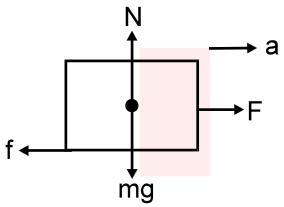
3. An inclined plane is moving with constant velocity v = 4 m/s on a horizontal surface as shown in figure. If a block of mass 2kg is kept at top of the incline and their is no friction between the block and the incline, then the distance travelled by the incline till the block reaches bottom of the inclined, is : (take g = 10 m/s^2)



(A) 4m (B) 5 m (C) $1.6\sqrt{5}$ m (D) $2\sqrt{5}$ m

Space for Rough Work

4. A block of mass m is kept on a rough horizontal floor having coefficient of friction μ. A constant horizontal force F is applied on the block towards right due to which it is moving with a constant acceleration a. Free body diagram of the object is shown in the figure.



Choose the correct alternative.

(A) According to Newton's 3rd law, mg is action and N is reaction

(B) According to Newton's 3rd law, F is action and f is reaction

(C) Friction force f can have any value between 0 to μmg

(D) $a = \frac{F-f}{m}$

5. A particle is moving in x-y plane. At certain instant, the components of its velocity and acceleration are as follows V_x = 3 m/s, V_y = 4 m/s, a_x = 2 m/s^2 and a_y = 1 m/s^2. The rate of change of speed at this moment is

(A) 4 m/s^2 (B) 2 m/s^2 (C) $\sqrt{3}$ m/s^2 (D) $\sqrt{5}$ m/s^2

6. Work required to stretch a spring of spring constant *K* by *x* is *W*. The work required to stretch it by additional *x* is

(A) *W* (B) 2*W* (C) 3*W* (D) 4*W*

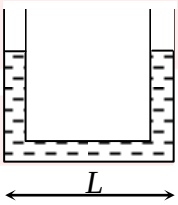
7. Magnetic field at ends of a long solenoid having *n* number of turns/ length and current *i* is

(A) $\mu_0 ni$ (B) $\mu_0 \frac{ni}{2}$ (C) zero (D) $2\mu_0 ni$

8. Momentum of a body is increased by 200 %. The percentage increase in its kinetic energy will be

(A) 200 % (B) 400 % (C) 600 % (D) 800 %

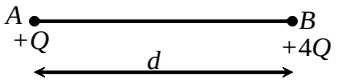
9. When at rest, a liquid stands at the same level in the tube as shown in figure. When the whole system is given acceleration *a* in the horizontal direction then the level of liquid on the two sides of the tube has a separation of *h*. The value of *h* will be



(A) $\frac{aL}{g}$ (B) $\frac{gL}{2a}$ (C) $\frac{gL}{a}$ (D) $\frac{aL}{2g}$

Space for Rough Work

10. Where should we put another charge on the line *AB* from *A*, so that it stays in equilibrium

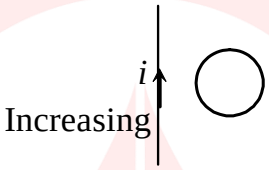


(A) $\frac{d}{2}$ (B) $\frac{d}{4}$ (C) $\frac{d}{6}$ (D) $\frac{d}{3}$

11. A man can jump upto height *h* on earth. How much he will be able to jump on a planet whose radius is half of earth's radius and mass is half of the mass of earth

(A) *h* (B) $\frac{h}{2}$ (C) 2 *h* (D) 4 *h*

12. In the arrangement shown, if current is increasing in the wire, the direction of induced current in the loop will be



(A) clockwise (B) anticlockwise (C) zero (D) none

13. Energy of second excited state of Li^{++} (given the energy of ground state electron in H-atom is –13.6 eV)

(A) –13.6 eV (B) –3.4 eV (C) –1.51 eV (D) –0.54 eV

14. The dimension of coefficient of viscosity is

(A) $ML^{-1}T^{-2}$ (B) $ML^{2}T^{-1}$ (C) $M^{-1}L^{-1}T^{-2}$ (D) $ML^{-1}T^{-1}$

15. Two vibrating tuning forks producing progressive waves given as $y_1 = 4 \sin(100\ \pi t)$ and $y_2 = 6 \sin(106\ \pi t)$ are held near the ear of a person. The person will hear

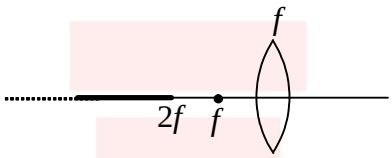
(A) 3 beats per sec with intensity ratio between maxima and minima equal to 5 : 1

(B) 3 beats per sec with intensity ratio between maxima and minima equal to 25 : 1

(C) 6 beats per sec with intensity ratio between maxima and minima equal to 5 : 1

(D) 6 beats per sec with intensity ratio between maxima and minima equal to 25 : 1

16. An object is spread from 2*f* to ∞ in front of a convex lens of focal length *f*, as shown in the figure. The length of the image of the object will be



(A) *f* (B) 2 *f* (C) *f*/2 (D) ∞

17. An object of mass 40 kg and having velocity 4 m/s collides with another object of mass 60 kg having velocity 2 m/s in same direction. The loss of energy when the collision is perfectly inelastic is

(A) 392 J (B) 440 J (C) 48 J (D) 110 J

Space for Rough Work

18. Sound waves of wavelength λ travelling with velocity *v* in a medium enter into another medium in which their velocity is 4*v*. The wavelength of sound in 2nd medium is

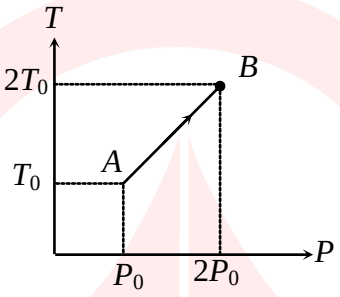
(A) 4 λ (B) λ (C)λ/4 (D) 16 λ

19. A boy is sitting in a car moving with uniform velocity. The boy throws a ball vertically upwards which falls back into his hands. A man standing on the road watches the motion of the ball. The path of the motion of the ball will be

(A) a straight line for the man (B) a straight line for the boy

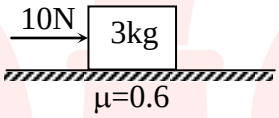
(C) a parabola for the boy (D) none of these

20. An ideal gas changes from state *A* to state *B* whose temperature (*T*) versus pressure (*P*) graph is given as shown. The work done by the gas is this process is



(A) positive (B) negative (C) zero (D) infinite

21. In the figure shown, the frictional force acting on the body is λ newton, then find the value of λ:

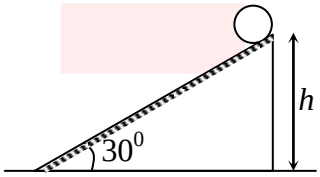


(A) 5 (B) 10 (C) 15 (C) 20

22. A particle is projected at an angle of 60° with the horizontal with speed of 20 ms^{-1}. Find the radius of curvature of the trajectory at the highest point (in meter) (g = 10 ms^{-2})

(A) 10 (B) 20 (C) 30 (D) 40

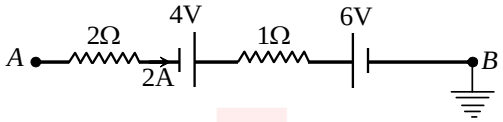
23. A ring of mass *m* and radius *r* rolls without slipping on the inclined surface shown. The time it will take to reach the bottom would be $N\sqrt{\frac{h}{g}}$, find the value of N.



(A) 2.5 (B) 3.5 (C) 4 (D) 5.5

Space for Rough Work

24. In the figure shown, the potential of *A* should be (in Volt)



(A) 8 (B) 10 (C) 12 (D) 14

25. If the error in measuring radius of a cylinder is 2 % and its height is 4 %, what will be percentage error in measuring its volume?

(A) 4.5 (B) 5.5 (C) 6.5 (D) 8

Space for Rough Work

SECTION – B : CHEMISTRY

26. The equation which is balanced and represents the incorrect product(s) is :

(A) $Li_2O + 2KCl \rightarrow 2LiCl + K_2O$

(B) $\left[CoCl(NH_3)_5\right]^{+} + 5H^{+} \rightarrow Co^{2+} + 5NH_4^{+} + Cl^{-}$

(C) $\left[Mg(H_2O)_6\right]^{2+} + (EDTA)^{4-} \xrightarrow{\text{excess NaOH}} \left[Mg(EDTA)\right]^{-2} + 6H_2O$

(D) $CuSO_4 + 4KCN \rightarrow K_3\left[Cu(CN)_4\right] + K_2SO_4$

27. The colour of light absorbed by an aqueous solution of $CuSO_4$ is

(A) Orange-red (B) Blue-green (C) Yellow (D) Violet

28. Among the following complexes (K–P)

$K_3[Fe(CN_6)]$(K), $[Co(NH_3)_6]Cl_3$(L), $Na_3[Co(ox)_3]$(M), $[Ni(H_2O)_6]Cl_2$(N)

$K_2[Pt(CN_4)]$(O), $[Zn(H_2O)_6](NO_3)_2$(P)

the diamagnetic complexes are

(A) K, L, M, N (B) K, M, O, P (C) L, M, O, P (D) L, M, N, O

29. Extraction of metal from the ore cassiterite does not involves

(A) carbon reduction of an oxide ore (B) self-reaction of a sulphide ore

(C) removal of copper impurity (D) removal of iron impurity

30. Extraction of copper from copper pyrite ($CuFeS_2$) does not involves

(A) crushing followed by concentration of the ore by froth-flotation

(B) removal of iron as slag

(C) self-reduction step to produce 'blister copper' following evolution of SO_2.

(D) refining of 'blister copper' by carbon reduction

31. Which of the following reactions produces N_2O is

(i) $Zn + dil.HNO_3 \longrightarrow$ (ii) $NH_4NO_3 \xrightarrow{\Delta}$

(iii) $SnCl_2 + HNO_3 \longrightarrow$ (iv) $NO + SO_2 + H_2O \longrightarrow$

(v) $NO + H_2S \longrightarrow$ (vi) $NH_2OH \cdot HCl + NaNO_2 \longrightarrow$

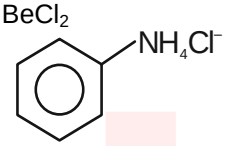
(A) only (i) & (ii) (B) only (i),(ii) & (iii)

(C) only (i),(ii),(iv) & (v) (D) (i), (ii), (iii), (iv), (v) & (vi)

Space for Rough Work

32. Which of the following examples are responsible for chromyl chloride test?

(i) AgCl (ii) $BeCl_2$

(iii) PCl_3 (iv) 

(v) NaCl (vi) $CaCl_2$

(A) only (i),(v) & (vi) (B) only (i),(ii),(iii) & (iv)

(C) only (iv),(v) & (vi) (D) only (ii),(iii),(v) & (vi)

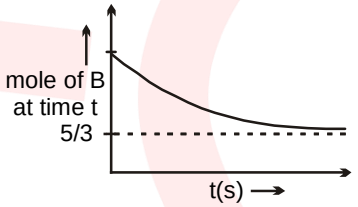
33. The correct order of electron given enthalpy is

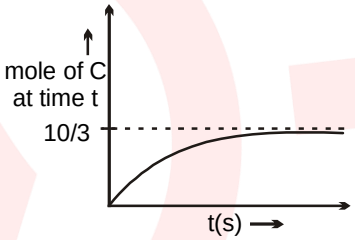
(A) Br > I > C > Si (B) Br > I > Si > C (C) I > Br > C > Si (D) I > Br > Si > C

34. Total number of Fe atoms in **Prussian's** blue is

(A) 4 (B) 7 (C) 10 (D) 6

35. Consider the following graphs plotted for the irreversible reaction : $3A + 2B \rightarrow 5C$





The moles of A and B respectively that were taken at t = 0 are :

(A) 2 mole, 2 mole (B) 2 mole, 3 mole (C) 3 mole, 3 mole (D) 3 mole,

36. A metal with work function ϕ is irradiated with a radiation of energy 5ϕ. The ratio of wavelengths of incident radiation to the electron emitted with maximum kinetic energy will be.

(m is mass of electron)

(A) $\frac{2C}{5}\sqrt{\frac{2m}{\phi}}$ (B) $\frac{5C}{2}\sqrt{\frac{2m}{\phi}}$ (C) $\frac{2C}{5}\sqrt{\frac{m}{2\phi}}$ (D) $\frac{5C}{2}\sqrt{\frac{m}{2\phi}}$

37. Which of the following is/are incorrect?

(i) Entropy decreases in a irreversible processes.

(ii) Entropy increases in a reversible processes.

(iii) Entropy can never be conserved in any process

(iv) Entropy is conserved in all processes like energy.

(A) (iii) (B) (iv) (C) (iv) and (iii) (D) All

38. In packing of solid Cr_2O_3, oxide ions form hcp and Cr^{+3} ions are present in some of the voids. The fraction of total number of voids that are left vacant is :

(A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{2}{9}$ (D) $\frac{7}{9}$

Space for Rough Work

39. Which of the following is incorrect for a crystal of CaF_2?

(A) Ca^{+2} forms ccp and F^- occupies all tetrahedral voids.

(B) Co-ordination no. of F^- is 4

(C) Co-ordination no. of Ca^{2+} is 4

(D) There are 4 formula units of CaF_2 per unit cell.

40. 1 mole of a salt $MCl_3(S)$ is added to 1 litre pure water at 27ºC. What will be the osmotic pressure of the solution if $K_{sp}(MCl_3) = \frac{10^{-12}}{3}$

(A) 24.63 atm (B) 98.52 atm

(C) 0.00821 atm (D) 0.03284 atm

41. 0.1 mole CH_3COOH and 0.05 mole $(CH_3COO)_2Ca$ is added in water to form 1 litre solution. pH of solution is found to be equal to 5 at a temperature T (constant). Now which of the following is incorrect?

(A) pka of CH_3COOH = 5

(B) pka of CH_3COOH = 5.3

(C) If 0.05 mole NaOH is added in the solution then new pH will be equal to 5.477.

(D) If 0.05 mole HCl is added in the solution then new pH will be equal to 4.523.

42. The fuel cell used for providing electrical power in the Apollo space programme used $O_2(g)$ and $H_2(g)$ as fuels. In the cell, hydrogen and oxygen are bubbled through porous carbon electrodes into concentrated aqueous sodium hydroxide solution. How much charge in terms of Faraday must be obtained from the cell so as to obtain 3.6 kg of pure water?

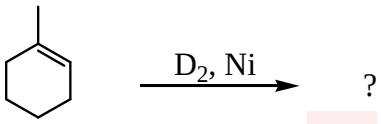
(A) 800 (B) 400 (C) 500 (D) 600

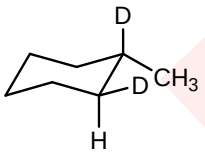
43. Radial wave function for an orbital of H atom is, $R(r) = ke^{\frac{-r}{a_0}}$ If ratio of probability of finding electron in a very thin shell (of thickness dr) at a distance a_0 to that at distance $\frac{a_o}{2}$ is $\frac{x}{e}$ than x is?

(A) 4 (B) 3 (C) 2 (D) 1

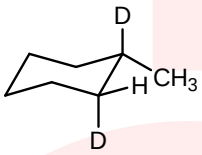
Space for Rough Work

44. Which would be the major product of the following reaction?

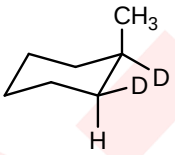




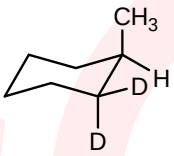
I



II



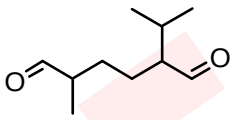
III



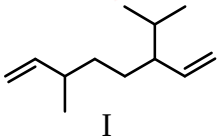
IV

(A) I (B) II (C) III (D) IV

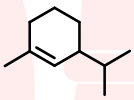
45. An alkene with the molecular formula $C_{10}H_{18}$ is treated with ozone and then with zinc and acetic acid. The product isolated from these reactions is:



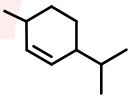
What is the structure of the alkene?



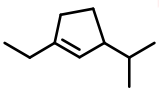
I



II



III

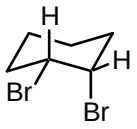


IV

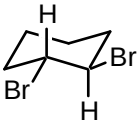
(A) I (B) II (C) III (D) IV

Space for Rough Work

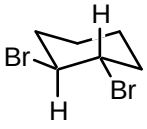
46. The reaction of Br_2/CCl_4 to cyclohexene would produce the compound(s) represented by structure(s):



I



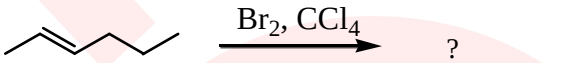
II

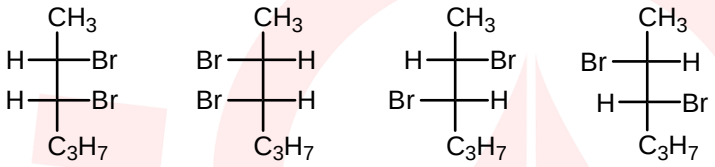


III

(A) I alone (B) II alone (C) II and III (D) III alone

47. What would be the major product of the following reaction?

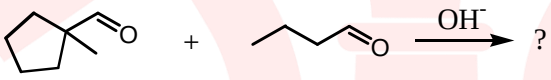


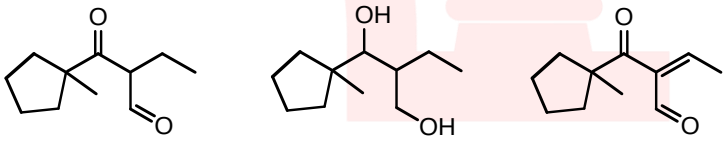


I II III IV

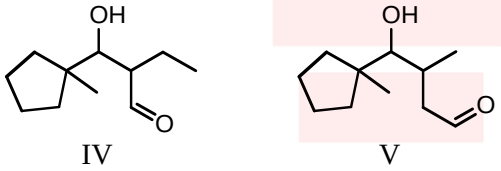
(A) Equal amounts of I and II
(B) Equal amounts of II and III
(C) Equal amounts of III and IV
(D) I and II as major products, III and IV as minor products

48. What would be the major product of the following reaction?





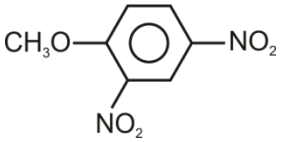
I II III



IV V

(A) I (B) II (C) III (D) IV

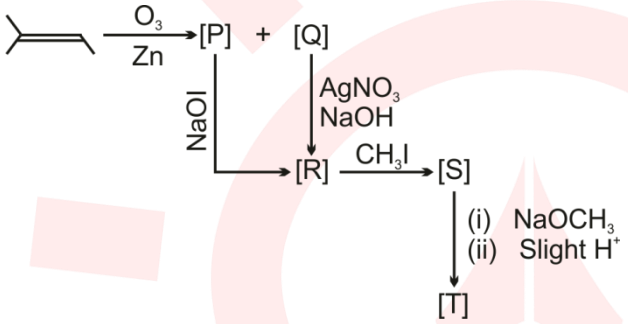
Space for Rough Work

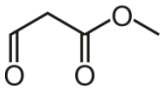
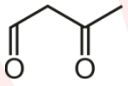
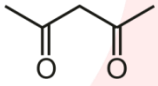
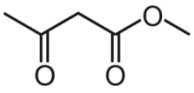
49. Which is the best route for the synthesis of  from benzene?

(A) $\xrightarrow[FeBr_3]{Br_2} \xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[CH_3OH]{NaOCH_3}$ (B) $\xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[FeBr_3]{Br_2} \xrightarrow[CH_3OH]{NaOCH_3}$

(C) $\xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[FeBr_3]{Br_2} \xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[CH_3OH]{NaOCH_3}$ (D) $\xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[FeBr_3]{Br_2} \xrightarrow[CH_3OH]{NaOCH_3} \xrightarrow[H_2SO_4]{HNO_3}$

50. The unknown compound "T" is



(A)  (B)  (C)  (D) 

Space for Rough Work

SECTION – C : MATHEMATICS

51. The domain of $y = \sqrt{\sqrt{\sin x} + \sqrt{\cos x} - 1}$

(A) $[2n\pi, (2n+1)\pi]$ (B) $[2n\pi, (3n+1)\pi]$ (C) $\left[2n\pi, (4n+1)\frac{\pi}{2}\right]$ (D) None of these

52. The period of $y = \tan\frac{5\pi}{17}[x]$ is :

(A) $\frac{17}{5}$ (B) $\frac{34}{5}$ (C) 17 (D) None of these

53. If A (3, 3), B (4, 3) and C (3, 4) be the vertices of a triangle, then the distance between it's orthocentre and circumcentre is

(A) $\sqrt{2}$ (B) $\frac{1}{\sqrt{2}}$ (C) $2\sqrt{2}$ (D) none of these

54. If the sum of the distances of a point from two perpendicular lines in a plane is 1, then its locus is

(A) square (B) a circle

(C) straight line (D) two intersecting lines

55. $\lim\limits_{x\to\infty} \frac{x^p + x^{p-1} + 1}{x^q + x^{q-2} + 2}$, where p > 0, q > 0 is

(A) 0 if p < q (B) 1 if p = q

(C) infinite, if p > q (D) All of the above

56. If the coordinates of a triangle are rational points, then the rational points is / are

(A) orthocenter (B) circumcentre (C) centroid (D) all of the above

57. Let $\theta = \tan^{-1}\left(\tan\frac{5\pi}{4}\right)$ and $\phi = \tan^{-1}\left(-\tan\frac{2\pi}{3}\right)$ then

(A) $\theta > \phi$ (B) $4\theta - 3\phi = 0$ (C) $\theta + \phi = \frac{\pi}{12}$ (D) None of these

58. Let $R\{(x,y) : x^2 + y^2 = 1, x, y \in R\}$ be a relation in R. The relation R is :

(A) reflexive (B) symmetric (C) transitive (D) anti-symmetric

59. For what value of x, the matrix $\begin{bmatrix} 3-x & 2 & 2 \\ 2 & 4-x & 1 \\ -2 & -4 & -1-x \end{bmatrix}$ is singular.

(A) x = 1, 2 (B) x = 0, 2 (C) x = 0, 1 (D) x = 0, 3

Space for Rough Work

60. The number of common tangents that can be drawn to the circle $x^2+ y^2– 4x – 6y – 3 = 0$ and $x^2 + y^2 + 2x + 2y + 1 = 0$ is

(A) 1 (B) 2 (C) 3 (D) 4

61. A bag contains 4 tickets numbered 1, 2, 3, 4 and another bag contains 6 tickets numbered 2, 4, 6, 7, 8, 9. One bag is chosen and a ticket is drawn. The probability that the ticket bears the number 4, is equal to

(A) $\frac{5}{12}$ (B) $\frac{5}{24}$ (C) $\frac{7}{12}$ (D) $\frac{19}{24}$

62. In a triangle ABC if cos A + 2cos B + cos C = 2. The sides of the triangle are in :

(A) H.P. (B) G.P. (C) A.P. (D) None of these

63. The value of sin 12°. sin48°.sin54° =

(A) 1/8 (B) 1/6 (C) 1/4 (D) ½

64. Rolle's theorem holds for the function $x^3 + bx^2 + cx$, $1 \le x \le 2$ at the point $\frac{4}{3}$, the value of b and c are;

(A) b = 8, c = - 5 (B) b = -5, c = 8 (C) b = 5, c = -8 (D) b = -5, c = -8.

65. Equation of the tangent to the curve $y = e^{-|x|}$ at the point where it cuts the line x=1

(A) is ey + x =2 (B) is x + y = e

(C) is ex + y = 1 (D) does not exist

66. Let f (x) = $\left(4 - x^2\right)^{2/3}$, then f has a

(A) a local maxima at x = 0 (B) a local maxima at x = 2

(C) a local maxima at x = –2 (D) none of these

67. If $x\frac{dy}{dx} = y\,(\log y – \log x + 1)$ then the solution of the equation is :

(A) $\log\frac{x}{y} = cy$ (B) $\log\frac{y}{x} = cy$ (C) $\log\frac{x}{y} = cx$ (D) $\log\frac{y}{x} = cx$

68. $I = \int \frac{(10x^9 + 10^x \log_e 10)}{(x^{10} + 10^x)} dx$ is equal to :

(A) $10^x + x^{10} + c$ (B) $10^x – x^{10} + c$ (C) $10^x + x^{10} + c$ (D) $\log_e (10^x + x^{10}) + c$

69. The value of $\int_{-10}^{10} \frac{3^x}{3^{[x]}} dx$ is equal to (where [.] denotes greatest integer function) :

(A) 20 (B) $\frac{40}{\ln 3}$ (C) $\frac{20}{\ln 3}$ (D) none of these

Space for Rough Work

70. Let $\vec{a},\vec{b},\vec{c}$ be three unit vectors such that $\vec{a}.\vec{b}=\vec{a}.\vec{c}=0$ If the angle between $\vec{b}$ and $\vec{c}$ is $\frac{\pi}{4}$, then $\vec{a}=\lambda(\vec{b}\times\vec{c})$, where '$\lambda$' is equal to:

(A) ± 1 (B) $\pm\sqrt{2}$ (C) ± 2 (D) None of these

71. The term independent of x in the expansion of $(1+x)^n(1+1/x)^n$ is

(A) $C_0^{\,2}+2C_1^{\,2}+3C_2^{\,2}+.....+(n+1)C_n^{\,2}$ (B) $(C_0+C_1+.....+C_n)^2$

(C) $C_0^{\,2}+C_1^{\,2}+.....+C_n^{\,2}$ (D) None of these

72. Number of ways in which four letter of the word 'DEGREE' can be selected is

(A) 7 (B) 6 (C) $\frac{6!}{3!}$ (D) None of these

73. If a, b and c are positive real numbers then $\frac{a}{b}+\frac{b}{c}+\frac{c}{a}$ is greater than or equal to

(A) 3 (B) 6 (C) 27 (D) None of those

74. The value of the expression $2\left(1+\frac{1}{\omega}\right)\left(1+\frac{1}{\omega^2}\right)+3\left(2+\frac{1}{\omega}\right)\left(2+\frac{1}{\omega^2}\right)+4\left(3+\frac{1}{\omega}\right)\left(3+\frac{1}{\omega^2}\right)$ + . . . + $(n+1)\left(n+\frac{1}{\omega}\right)\left(n+\frac{1}{\omega^2}\right)$, where ω is an imaginary cube root of unity, is

(A) $\frac{n\left(n^2+2\right)}{3}$ (B) $\frac{n\left(n^2-2\right)}{3}$ (C) $\frac{n^2(n+1)^2+4n}{4}$ (D) none of these

75. The equation of the plane containing the line $\frac{x-\alpha}{l}=\frac{y-\beta}{m}=\frac{z-\gamma}{n}$ is $a(x-\alpha)+b(y-\beta)+c(z-\gamma)=0$, where $al+bm+cn$ is equal to

(A) 1 (B) –1 (C) 2 (D) 0

Space for Rough Work