

SAMPLE PAPER

FOR CLASS

12th Pass Students

STREAM : [MEDICAL]

TIME : 2 Hours

FULL MARKS : 480

INSTRUCTIONS

[A] General

1. This Question paper contains THREE Parts, A, B and C (Physics, Chemistry, and Biology).
2. This Question Paper contains 20 pages including cover page.
3. This question paper contains total 120 questions (30 Question in Physics 30 in Chemistry and 60 Question in Biology)
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. A ball is thrown vertically upward with a speed v from a height h meter above the ground. The time taken for the ball to hit ground is

- (A) $\frac{v}{g}\sqrt{1-\frac{2gh}{v^2}}$ (B) $\frac{v}{g}\sqrt{1+\frac{2gh}{v^2}}$ (C) $\sqrt{1+\frac{2gh}{v^2}}$ (D) $\frac{v}{g}\left[1+\sqrt{1+\frac{2gh}{v^2}}\right]$

2. A particle moves along the positive branch of the curve $y = \frac{x^2}{2}$ where $x = \frac{t^2}{2}$ and y are measured

in metres and t in second .At $t = 2$ s, the velocity of the particle is

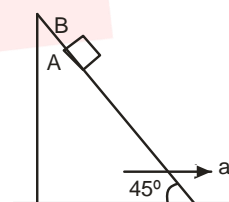
- (A) $2\hat{i} - 4\hat{j}$ m/s (B) $4\hat{i} + 2\hat{j}$ m/s (C) $2\hat{i} + 4\hat{j}$ m/s (D) $4\hat{i} - 2\hat{j}$ m/s

3. A balloon of weight w is falling vertically downward with a constant acceleration a ($<g$).The magnitude of the air resistance is

- (A) w (B) $w\left(1+\frac{a}{g}\right)$ (C) $w\left(1-\frac{a}{g}\right)$ (D) $w = \frac{a}{g}$

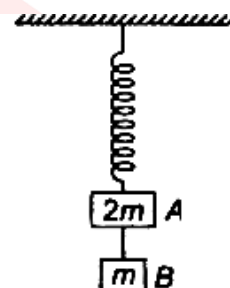
4. If the coefficient of friction between A and B is μ , the maximum acceleration of the wedge A for which B will remain at rest with respect to the wedge is

- (A) μg (B) $g\left(\frac{1+\mu}{1-\mu}\right)$
 (C) $g\left(\frac{1-\mu}{1+\mu}\right)$ (D) $\frac{g}{\mu}$

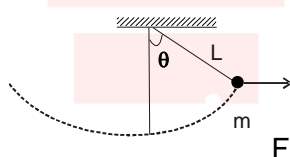


5. Two blocks of masses $2m$ and m are in equilibrium as shown in the figure. Now the string between the blocks is suddenly broken. The accelerations of the blocks A and B respectively at that instant are

- (A) g and g (B) g and $\frac{g}{2}$
 (C) $\frac{g}{2}$ and g (D) $\frac{g}{2}$ and $\frac{g}{2}$



6. An object of mass m is tied to a string of length L and a variable horizontal force is applied on it which starts at zero and gradually increases until the string makes an angle with the vertical. Work done by the force F is



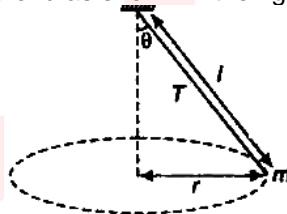
- (A) $mgL(1-\sin\theta)$ (B) mgL (C) $mgL(1-\cos\theta)$ (D) $2mgL(1-\cos\theta)$

Space for Rough Work

7. A car is circulating on a circular path of radius r . At some instant its velocity is v and rate of increase of speed is a . The resultant acceleration of the car will be

(A) $\sqrt{\frac{v^2}{a^2} + r^2}$ (B) $\sqrt{\frac{v^2}{r} + a}$ (C) $\sqrt{\frac{v^4}{r^2} + a^2}$ (D) $\left(\frac{v^2}{r} + a\right)$

8. A string of length l fixed at one end carries a mass m at the other end. The string makes $\frac{2}{\pi}$ rev/s around the axis through the fixed end as shown in the figure, the tension in the string is



- (A) 16 ml (B) 4 ml (C) 8 ml (D) 2 ml
9. The kinetic energy K of a particle moving along a circle of radius R depends on the distance covered s as $K = as^2$. The force acting on the particles is

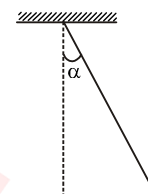
(A) $\frac{2as^2}{R}$ (B) $2as\left(1 + \frac{s^2}{R^2}\right)^{1/2}$ (C) $as\left(1 + \frac{s^2}{R^2}\right)^{1/2}$ (D) None of these

10. A simple pendulum is vibrating with an angular amplitude of 90° as shown in the figure. For what value of α , is the acceleration directed ?

- (i) Vertically upwards (ii) Horizontally (iii) Vertically downwards

(A) $0^\circ, \cos^{-1}\left(\frac{1}{\sqrt{3}}\right), 90^\circ$ (B) $90^\circ, \cos^{-1}\left(\frac{1}{\sqrt{3}}\right), 0^\circ$

(C) $0^\circ, \cos^{-1}\sqrt{3}, 90^\circ$ (D) $\cos^{-1}\frac{1}{\sqrt{3}}, 90^\circ, 0^\circ$



11. An object of mass $3m$ splits into three equal fragments. The fragments have velocities $v\hat{j}$ and $v\hat{i}$. The velocity of the third fragment is

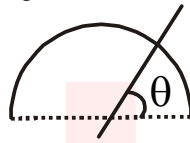
(A) $v(\hat{j} - v\hat{i})$ (B) $v(\hat{i} - v\hat{j})$ (C) $-v(\hat{i} + \hat{j})$ (D) $\frac{v(\hat{i} + \hat{j})}{\sqrt{2}}$

12. A body of mass m_1 moving with a velocity 3 ms^{-1} collides with another body at rest of mass m_2 . After collision the velocities of the bodies are 2 ms^{-1} and 5 ms^{-1} respectively along the direction of motion of m_2 . The ratio $\frac{m_1}{m_2}$ is

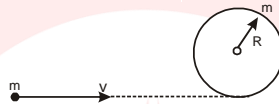
(A) $\frac{5}{12}$ (B) 5 (C) $\frac{1}{5}$ (D) $\frac{12}{5}$

Space for Rough Work

13. The moment of inertia of a semicircular ring of mass M and radius R about an axis which is passing through its centre and at an angle θ with the line joining its ends as shown in figure is

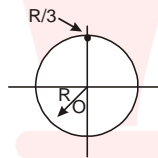


- (a) $\frac{MR^2}{4}$ at $\theta = 0^\circ$ (b) $\frac{MR^2}{2}$ if $\theta = 0^\circ$ (c) $\frac{MR^2}{2}$ if $\theta = 45^\circ$ (d) $\frac{MR^2}{2}$ if $\theta = 90^\circ$
 (A) a, b, c (B) b, c, d (C) a, c, d (D) none
14. A circular disc of mass m and radius R rests flat on a horizontal frictionless surface. A bullet, also of mass m and moving with a velocity v , strikes that disc and gets embedded in it.

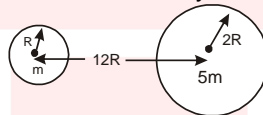


The angular velocity with which the system rotates after the bullet strikes the hoop is

- (A) $\frac{v}{2R}$ (B) $\frac{v}{3R}$ (C) $\frac{2v}{3R}$ (D) $\frac{3v}{4R}$
15. From a circular disc of radius R and mass $9M$, a small disc of radius $\frac{R}{3}$ is removed from the disc, the moment of inertia of the remaining disc about an axis perpendicular to the plane of the disc and passing O is



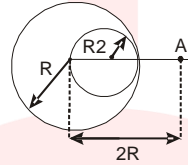
- (A) $4MR^2$ (B) $\frac{40}{9}MR^2$ (C) $10MR^2$ (D) $\frac{37}{9}MR^2$
16. Two spherical bodies of masses m and $5m$ and radii R and $2R$ respectively are released in free space with initial separation between their centers equal to $12R$. If they attract each other due to gravitational force only then the distance covered by smaller sphere just before collision will be



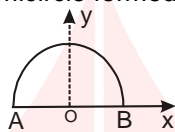
- (A) $5R$ (B) $7.5R$ (C) $\frac{2R}{3}$ (D) R
17. Two particles of mass m and M are initially at rest at infinite distance. Find their relative velocity of approach due to gravitational attraction when d is separation at any instant
- (A) $\sqrt{\frac{2G(M+m)}{d}}$ (B) $\sqrt{\frac{G(M+m)}{d}}$ (C) $\sqrt{\frac{G(M+m)}{2d}}$ (D) $\sqrt{\frac{G(M+m)}{4d}}$

Space for Rough Work

18. A solid sphere of uniform density and radius R applies a gravitational force of attraction equal to F_1 on a particle placed at a distance $2R$ from the centre of the sphere. A spherical cavity of radius $\frac{R}{2}$ is now made in the sphere as shown in the figure. The sphere with cavity now applies a gravitational force F_2 on the same particle. The ratio $\frac{F_2}{F_1}$ is

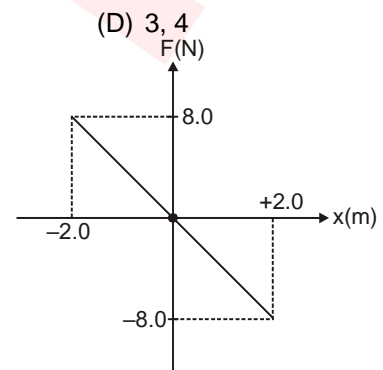


- (A) $\frac{5}{9}$ (B) $\frac{7}{8}$ (C) $\frac{3}{4}$ (D) $\frac{7}{9}$
19. Gravitational field at the centre of a semicircle formed by a thin wire AB of mass M and length l is



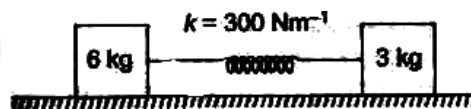
- (A) $\frac{GM}{l^2}$ along x – axis (B) $\frac{GM}{\pi l^2}$ along y – axis
 (C) $2\pi \frac{GM}{l^2}$ along x – axis (D) $\frac{2\pi GM}{l^2}$ along y – axis
20. The displacement equation of a particle is $x = 3 \sin 2t + 4 \cos 2t$. The amplitude and maximum velocity will be respectively
- (A) 5, 10 (B) 3, 2 (C) 4, 2 (D) 3, 4

21. A body of mass 0.1 kg executes simple harmonic motion (SHM) about $x = 0$ under the influence of a force shown in figure. The period of the SHM is
- (A) 0.99 s
 (B) 0.52 s
 (C) 0.25 s
 (D) 0.31 s

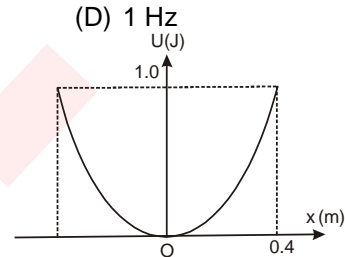


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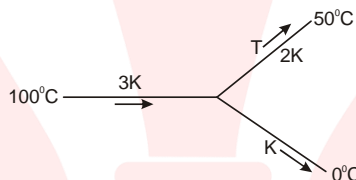
22. Two point masses of 3.0 kg and 6.0 kg are attached to opposite ends of horizontal spring whose spring constant is 300 Nm^{-1} as shown in the figure. The natural vibration frequency of the system is approximately



- (A) 4 Hz (B) 3 Hz (C) 2 Hz (D) 1 Hz
23. A particle of mass 2 kg moves in simple harmonic motion and its potential energy U varies with position x as shown. The period of oscillation of the particle is



- (A) $\frac{2\pi}{5} \text{ s}$ (B) $\frac{2\sqrt{2}\pi}{5} \text{ s}$ (C) $\frac{\sqrt{2}\pi}{5} \text{ s}$ (D) $\frac{4\pi}{5} \text{ s}$
24. A cylinder of radius r and of thermal conductivity K_1 is surrounded by a cylindrical shell of inner radius r and outer radius $2r$ made of a material of thermal conductivity K_2 . The effective thermal conductivity of the system is
- (A) $\frac{1}{3}(K_1 + 2K_2)$ (B) $\frac{1}{2}(2K_1 + 3K_2)$ (C) $\frac{1}{3}(3K_2 + 2K_1)$ (D) $\frac{1}{4}(K_1 + 3K_2)$
25. Three rods of same dimensions have thermal conductivities $3K$, $2K$, and K . They are arranged as shown below



What will be temperature T of the junction ?

- (A) $\frac{200}{3} \text{ }^\circ\text{C}$ (B) $\frac{100}{3} \text{ }^\circ\text{C}$ (C) $75 \text{ }^\circ\text{C}$ (D) $\frac{50}{3} \text{ }^\circ\text{C}$
26. The equation of a progressive wave is $y = 8 \sin \left[\pi \left(\frac{t}{10} - \frac{x}{4} \right) + \frac{\pi}{3} \right]$. The wavelength of the wave is
- (A) 8 m (B) 4 m (C) 2 m (D) 10 m
27. If two waves represented by $Y_1 = 4 \sin \omega t$ and $y_2 = 3 \sin \left(\omega t + \frac{\pi}{3} \right)$ interfere at a point, the amplitude of the resulting wave will be about
- (A) 7 (B) 6.08 (C) 5 (D) 3.5
28. Direction of the first secondary maximum in the Fraunhofer diffraction pattern at a single slit is given by (a is the width of the slit)
- (A) $a \sin \theta = \frac{\lambda}{2}$ (B) $a \cos \theta = \frac{3\lambda}{2}$ (C) $a \sin \theta = \lambda$ (D) $a \sin \theta = \frac{3\lambda}{2}$

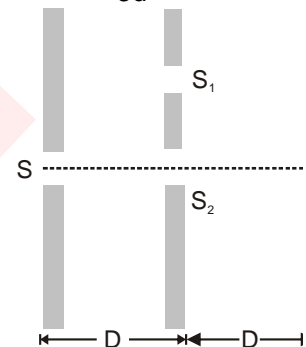
Space for Rough Work

29. In Young's double slit experiment, white light is used. The separation between the slits is b . The screen is at a distance d ($d \gg b$) from the slits. Some wavelengths are missing exactly in front of one slit. These wavelengths are

- (A) $\lambda = \frac{b^2}{2d}$ (B) $\lambda = \frac{2b^2}{d}$ (C) $\lambda = \frac{b^2}{3d}$ (D) $\lambda = \frac{2b^2}{3d}$

30. Two ideal slits S_1 and S_2 are at a distance d apart and illuminated by light of wavelength λ passing through an ideal source slit S placed on the line through S_2 as shown. The distance between the planes of slits and the sources slit. is D . A screen is held at a distance D from the plane of the slits. The minimum value of d for which there is darkness at O is

- (A) $\sqrt{\frac{3\lambda D}{2}}$ (B) $\sqrt{\lambda D}$
 (C) $\sqrt{\frac{\lambda D}{2}}$ (D) $\sqrt{3\lambda D}$



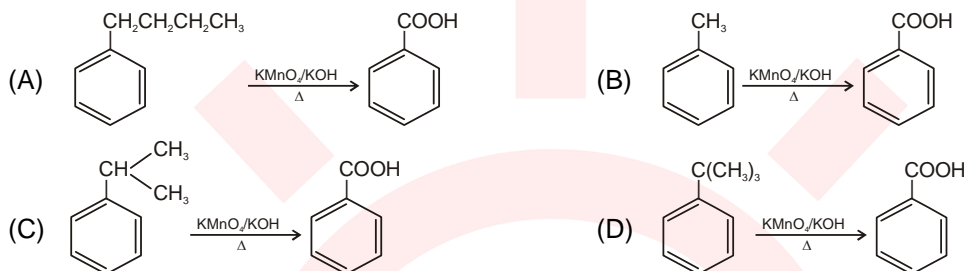
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SECTION – B : CHEMISTRY

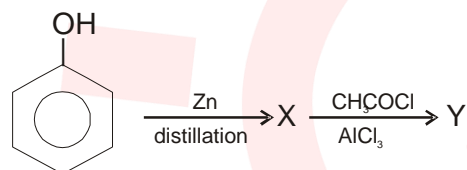
31. The equation which is balanced and represents the incorrect product(s) is :
- (A) $\text{Li}_2\text{O} + 2\text{KCl} \rightarrow 2\text{LiCl} + \text{K}_2\text{O}$
- (B) $[\text{CoCl}(\text{NH}_3)_5]^+ + 5\text{H}^+ \rightarrow \text{Co}^{2+} + 5\text{NH}_4^+ + \text{Cl}^-$
- (C) $[\text{Mg}(\text{H}_2\text{O})_6]^{2+} + (\text{EDTA})^{4-} \xrightarrow{\text{excess NaOH}} [\text{Mg}(\text{EDTA})]^{-2} + 6\text{H}_2\text{O}$
- (D) $\text{CuSO}_4 + 4\text{KCN} \rightarrow \text{K}_3[\text{Cu}(\text{CN})_4] + \text{K}_2\text{SO}_4$
32. The colour of light absorbed by an aqueous solution of CuSO_4 is
- (A) Orange-red (B) Blue-green (C) Yellow (D) Violet
33. Among the following complexes (K–P)
 $\text{K}_3[\text{Fe}(\text{CN}_6)]$ (K), $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ (L), $\text{Na}_3[\text{Co}(\text{ox})_3]$ (M), $[\text{Ni}(\text{H}_2\text{O})_6]\text{Cl}_2$ (N)
 $\text{K}_2[\text{Pt}(\text{CN}_4)]$ (O), $[\text{Zn}(\text{H}_2\text{O})_6](\text{NO}_3)_2$ (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
34. Extraction of metal from the ore cassiterite does not involve
- (A) carbon reduction of an oxide ore (B) self-reaction of a sulphide ore
 (C) removal of copper impurity (D) removal of iron impurity
35. Extraction of copper from copper pyrite (CuFeS_2) does not involve
- (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
36. Which of the following reactions produces N_2O is
- (i) $\text{Zn} + \text{dil. HNO}_3 \longrightarrow$ (ii) $\text{NH}_4\text{NO}_3 \xrightarrow{\Delta}$
 (iii) $\text{SnCl}_2 + \text{HNO}_3 \longrightarrow$ (iv) $\text{NO} + \text{SO}_2 + \text{H}_2\text{O} \longrightarrow$
 (v) $\text{NO} + \text{H}_2\text{S} \longrightarrow$ (vi) $\text{NH}_2\text{OH} \cdot \text{HCl} + \text{NaNO}_2 \longrightarrow$
- (A) only (i) & (ii) (B) only (i), (ii) & (iii)
 (C) only (i), (ii), (iv) & (v) (D) (i), (ii), (iii), (iv), (v) & (vi)

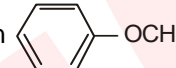
Space for Rough Work

37. The correct order of electron given enthalpy is
 (A) $\text{Br} > \text{I} > \text{C} > \text{Si}$ (B) $\text{Br} > \text{I} > \text{Si} > \text{C}$ (C) $\text{I} > \text{Br} > \text{C} > \text{Si}$ (D) $\text{I} > \text{Br} > \text{Si} > \text{C}$
38. Total number of Fe atoms in **Prussian's** blue is
 (A) 4 (B) 7 (C) 10 (D) 6
39. Which of the following reactions does not occur ?



40. Identify the final product of the reaction sequence.



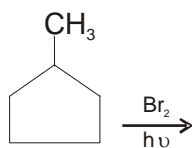
- (A) Benzophenone (B) Acetophenone (C) Diphenyl (D) Methyl salicylate
41. In the reaction  the products are:



42. Which of the following sequence of reactions (reagents) can be used for conversion of $\text{C}_6\text{H}_5 - \text{CH}_2 - \text{CH}_3$ into $\text{C}_6\text{H}_5\text{CH} = \text{CH}_2$?
 (A) $\text{SOCl}_2 ; \text{H}_2\text{O}$ (B) $\text{SO}_2\text{Cl}_2 ; \text{alc. KOH}$
 (C) $\text{Cl}_2/h\nu ; \text{H}_2\text{O}$ (D) $\text{SOCl}_2 ; \text{alc. KOH}$
43. Which one is correct ?
 (A) Freon-14 is CF_4 , Freon-13 is CF_3Cl , Freon-12 is CF_2Cl_2 and Freon-11 is CFCl_3
 (B) Freons are chlorofluorocarbons
 (C) Freons are used as refrigerants
 (D) All the above

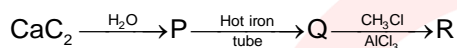
Space for Rough Work

44. In the following reaction, the major product is :



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

45. In the following reaction, the product 'R' is:



- (A) Benzene (B) Ethylbenzene (C) Toluene (D) N-propylbenzene

46. C_9H_{14} [X] $\xrightarrow{\text{ozonolysis}}$ hence X is:

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

47. Select the basic strength order of following molecules ?

- (i) (ii) (iii) (iv)

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

48. Resonance effect involves:

- (A) Delocalization of π -electrons along a conjugated system
 (B) Delocalization of lone pair along a conjugated system
 (C) Delocalization of negative charge along a conjugated system
 (D) All are correct

49. $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{Cl}$

Inductive effect of chlorine is zero on:

- (A) C₁ (B) C₂ (C) C₃ (D) C₄

Space for Rough Work

50. Which of the following is having maximum atoms
(A) 9.8g H₂SO₄ (B) 342 g Sucrose
(C) 180 g Glucose (D) 6.72 Litres of Butane gas at NTP
51. Which of the following is not a state function ?
(A) ΔS (B) ΔG (C) ΔH (D) Q
52. What is [H⁺] in mol/L of a solution that is 0.20 M in CH₃COONa and 0.10 M in CH₃COOH? K_a for CH₃COOH = 1.8×10^{-5}
(A) 3.5×10^{-4} (B) 1.1×10^{-5} (C) 1.8×10^{-5} (D) 9.0×10^{-6}
53. The freezing point depression constant for water is $1.86^\circ \text{C m}^{-1}$. If 5.00 g Na₂SO₄ is dissolved in 45.0 g H₂O, the freezing point is changed by -3.82°C . Calculate the van't Hoff factor for Na₂SO₄.
(A) 2.05 (B) 2.63 (C) 3.11 (D) 0.381
54. Number of neutrons in a parent nucleus X which gives ${}^7_7\text{N}^{14}$ after two successive β -emission would be
(A) 6 (B) 7 (C) 8 (D) 9
55. K_{SP} of CuS, Ag₂S and HgS are 10^{-31} , 10^{-44} and 10^{-54} respectively. Select the correct order for their solubility in water.
(A) Ag₂S > HgS > CuS (B) HgS > CuS > Ag₂S
(C) HgS > Ag₂S > CuS (D) Ag₂S > CuS > HgS
56. The standard oxidation potentials of Cu/Cu²⁺ and Cu⁺/Cu²⁺ are E = - 0.34 V and - 0.16 V respectively. The standard electrode potential of Cu⁺/Cu would be :
(A) 0.18V (B) 0.52V (C) 0.82V (D) 0.49V
57. Which of the following has smallest number of molecules?
(A) 0.1 moles of CO₂ gas (B) 11.2 L of CO₂ gas at NTP
(C) 22.2 g of CO₂ gas (D) 22.4×10^3 mL of CO₂ gas at NTP
58. The average atomic weight of an element A is 51.7. The abundance of lighter isotope of mass 50 as compared to the other isotope of mass 52 is
(A) 15% (B) 45% (C) 50% (D) 85%
59. 8g of a radioactive substance is reduced to 0.5g after one hour. The half-life of the radioactive substance is:
(A) 15 min (B) 30 min (C) 45 min (D) 10 min
60. For a reaction $\Delta H = +3 \text{ kJ}$ and $\Delta S = + 10 \text{ J/K}$ at which temperature this reaction will be spontaneous ?
(A) 210 K (B) 200 K (C) 273 K (D) 373 K

Space for Rough Work

SECTION – C : BIOLOGY

61. Herbarium is one of the important tools that were used for identification of plants. Which one of the following is correct regarding it ?
- (A) It provides information about the local flora and fauna of that region.
(B) The information provided by them are useful in locating wild varieties and relatives of economically important plants
(C) The new material added to the collection of herbarium is known as acquisition.
(D) It provides living plant material for systematic work
62. An insectivorous angiosperm in which roots are absent is
- (A) Utricularia (B) Rhizophora (C) Nepenthes (D) Dracena
63. The organic substance present in mesophyll cells are passed into the sieve tubes through their companion cells by
- (A) an active transport (B) simple diffusion (C) facilitated diffusion (D) Osmosis
64. Guttation takes place through
- (A) stomata (B) hydathodes (C) water pore (D) both (B) and (C)
65. Which enzyme of TCA/Krebs' cycle is not present in mitochondrial matrix ?
- (A) Malate dehydrogenase (B) Citrate synthase
(C) Aconitase (D) Succinate dehydrogenase
66. Which among the following is an inverted pyramid ?
- (A) Pyramid of energy in grassland (B) Pyramid of number in pond ecosystem
(C) Pyramid of number in grassland (D) Pyramid of biomass in an aquatic system
67. Match column I with column II and select the correct option
- | Column I | Column II |
|----------------------|-------------------------|
| 1. Golden rice | p. High protein content |
| 2. Brassica napus | q. Cry 1 Ab |
| 3. Bt corn | r. β -carotene |
| 4. Transgenic potato | s. Hirudin |
- (A) 1-a, 2-p, 3-r, 4-q
(B) 1-r, 2-s, 3-q, 4-p
(C) 1-q, 2-r, 3-p, 4-s
(D) 1-q, 2-s, 3-p, 4-r

Space for Rough Work

68. Read the given statements.

- (i) In prokaryotes, the photosynthetic pigments are found in the _____.
- (ii) DCMU is a herbicide which blocks_____.

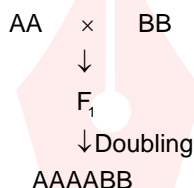
Select the correct option which correctly fills the two blanks.

- | | |
|-----------------|-------|
| (i) | (ii) |
| (A) Thylakoid | PS II |
| (B) Chloroplast | PS I |
| (C) Thylakoid | PS I |
| (D) Chloroplast | PS II |

69. The thylakoids of chloroplast are removed and kept in a culture medium containing carbon dioxide and water. If the set up is exposed to light, hexose sugars are not formed as end products. The most appropriate reason for this is that

- (A) carbon assimilation cannot take place in the presence of light
- (B) the pigment systems are not working
- (C) the enzymes are not available
- (D) the light trapping device is non-functional

70. What does the following cross represents ?



- | | |
|------------------------|--------------------------|
| (A) Autopolyploidy | (B) Allopolyploidy |
| (C) Autoallopolyploidy | (D) Spontaneous mutation |

71. Match the organisms given in column I with their common names in column II and choose the correct option.

Column-I

- A. Chondrus
- B. Sphagnum
- C. Cladonia
- D. Selaginella

Column-II

- (i) Peat moss
- (ii) Spike moss
- (iii) Irish moss
- (iv) Reindeer moss

- | | |
|--|--------------------------------|
| (A) A-(iii), B-(i), C-(iv), D-(ii) (B) | A-(iii), B-(ii), C-(iv), D-(i) |
| (C) A-(iv), B-(i), C-(iii), D-(ii) (D) | A-(i), B-(iv), C-(ii), D-(iii) |

72. Pick out the wrong statements.

- (i) The stamens in the Family Cucurbitaceae are synandrous, extrose and monotheous
 - (ii) The entire shoot is modified for assimilatory function in cladodes.
 - (iii) Adventitious roots of Pandanus is an example of clinging roots
 - (iv) Meristematic tissue is a group of thin-walled isodiametric cells which are capable of cell division.
- (A) (i) and (ii) only (B) (iii) and (iv) only (C) (ii) and (iii) only (D) (i) and (iv) only

Space for Rough Work

73. Study the given table.

Biomagnification

Eutrophication

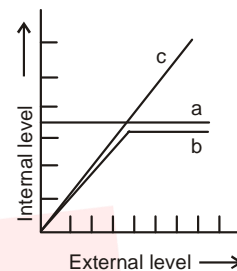
- | | |
|---|---|
| (i) It is the increase in concentration of non bio degradable substance in the food chain | It is the enrichment of the water body with plant nutrients |
| (ii) It is found in aquatic ecosystem only | It is found in oceans only |
| (iii) It does not result in organic loading | It leads to organic loading |
| (iv) It leads to toxicity in higher order consumers | It leads to toxicity in low order consumers |

On the above given differences.

- | | |
|-------------------------------------|--|
| (A) (i) and (ii) alone are correct | (B) (i) and (iii) alone are correct |
| (C) (ii) and (iv) alone are correct | (D) (i), (iii), and (iv) alone are correct |

74. Which of the following statements is incorrect ?

- (A) Birds and mammals belong to category 'a'.
 (B) Animals in category 'b' always maintain constant internal environment.
 (C) Osmotic concentration of animals in category 'c' changes according to ambient conditions.
 (D) Animals of category 'b' shows suspended development during favourable conditions.



75. Substrates used in floating respiration are

- | | |
|----------------------------|------------------------|
| (A) proteins only | (B) fats and proteins |
| (C) carbohydrates and fats | (D) carbohydrates only |

76. Bicarpellary syncarpous gynoecium is not found in the flowers of

- | | |
|-----------------------|-------------------------|
| (A) Atropa belladonna | (B) Solanum tuberosum |
| (C) Cestrum nocturnum | (D) Colchicum autumnale |

77. Spindle of plant cells is called

- | | | | |
|---------------|--------------|--------------|----------------------|
| (A) amphiastr | (B) anastral | (C) acentric | (D) both (B) and (C) |
|---------------|--------------|--------------|----------------------|

78. Which of the following is/are autosomal recessive trait/traits

- | | | | |
|--------------|------------------------|-----------------|------------------|
| (A) Albinism | (B) Sickle cell anemia | (C) Thalessemia | (D) All of these |
|--------------|------------------------|-----------------|------------------|

79. Which of the following statements is wrong?

- (A) In Pinus, male gametophyte is free-living.
 (B) The sporophyte of Polytrichum is more developed than that in Riccia.
 (C) Wolffia is the smallest known angiosperm
 (D) Salvinia is a heterosporous pteridophyte

80. Select the option which clearly differentiates phellem from phelloderm

Phellem

Phelloderm

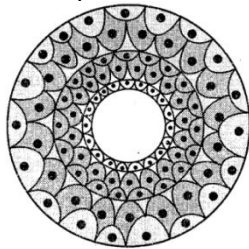
- | | |
|--|--|
| (A) It is formed on the innerside of phellogen | It is formed on the outside of phellogen |
| (B) It is made up of living cells | It is made up of dead cells |
| (C) Its cells store the food | It is protective in function |
| (D) Suberisation is present | Suberisation is absent |

Space for Rough Work

81. A stage of hydrosere in which Hydrilla and Potamogeton are found.
(A) Submerged stage (B) Floating stage
(C) Reed swamp stage (D) March meadow stage
82. The double stranded DNA has 15% of cytosine. The percentage of adenine in DNA will be
(A) 35% (B) 30% (C) 45% (D) 70%
83. Triticum is known as festucoid grass because
(A) vascular bundle is surrounded by single sheath of compactly arranged parenchyma cells
(B) vascular bundle is chlorenchymatous
(C) vascular bundle is sclerenchymatous
(D) vascular bundle is surrounded by double sheath of compactly arranged paranchyma cells
84. Lysozyme is not present in
(A) saliva (B) tears (C) tissue fluid (D) sweat
85. Warm blooded animals of colder areas have large body size compared to animals of warmer areas. This is
(A) Allen's rule (B) Gloger's rule
(C) Bergamann's rule (D) Jordan's rule
86. Which of the following hormones is used to prevent the sprouting of potatoes ?
(A) 2–4–dichlorophenoxy acetic acid (B) 2, 4, 5–trichlorophenoxy acetic acid
(C) Indole–3–Acetic acid (D) 2–methyl–4–chlorophenoxy acetic acid
87. Nodule formation in roots of leguminous plants is stimulated by _____ produced by cortical cells and _____liberated by invading bacteria.
(A) cytokinin, gibberellin (B) auxin, cytokinin
(C) auxin, ethylene (D) gibberellin, ethylene
88. Select the incorrect statement from the following.
(A) Water is absorbed by a system having DPD = 10 atm from another system having DPD= 5 atm
(B) The values of turgor pressure and solute potential are same in case of fully turgid cell.
(C) DPD becomes 0 in case of a flaccid cells.
(D) Osmotic potential is the reduction in free energy of water due to decrease in number of water molecules per molal volume.
89. Which of the following pairs is incorrectly matched ?
(A) Kinetin – adenine derivative
(B) Gibberelline – terpenes
(C) Ethylene – gases
(D) ABA – indole compounds
90. Flowers of Kigelia pinnata have abundant nectar and prominent stamens. They are pollinated by
(A) insects (B) winds (C) birds (D) bats

Space for Rough Work

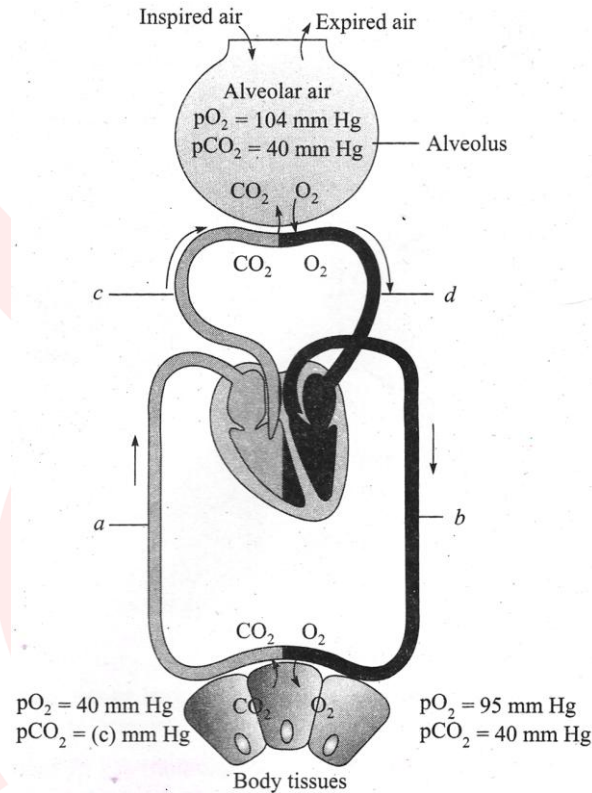
91. This diagrammatic sectional view is the representation of



- (A) Coelomate (B) Pseudocoelomate (C) Acoelomate (D) Both 2 and 3
92. True segmentation or metamerism means
 (A) Body is externally and internally divided into segments
 (B) Each segment of body have serial repetition of at least some organs
 (C) Both (A) and (B)
 (D) There is no repetition of any organ in successive segments.
93. Select the incorrect statement.
 (A) In Urochordata, notochord is present only in larval tail.
 (B) In Cephalochordate notochord is present in head region only and is persistent throughout their life.
 (C) In vertebrata, notochord is replaced by vertebral column in adult.
 (D) All vertebrates are chordates but all chordates are not vertebrates.
94. Substrate concentration at which reaction attains half of its maximum velocity is called
 (A) $1/2 V_{max}$ (B) $[S] 1/2$ (C) K_{max} (D) K_m
95. Increased liquidity of the faecal discharge is known as
 (A) Indigestion (B) Constipation (C) Diarrhoea (D) Vomiting
96. The causes of indigestion are
 (A) Inadequate enzyme secretion (B) Over eating and spicy food
 (C) Food poisoning and anxiety (D) All of these
97. A feeling of nausea before
 (A) Indigestion (B) Constipation (C) Diarrhoea (D) Vomiting
98. Which of the following is not a correct matching group of developmental fates of the primary germ layers?
 (A) Ectoderm : Epidermis, Central nervous system, sense organs, neural crest
 (B) Mesoderm : Skeleton, muscles, blood vessels, heart, liver, gonads
 (C) Endoderm : Lining of digestive and respiratory tracts, pancreas
 (D) Ectoderm : Pineal gland, pituitary gland, adrenal medulla
99. How much percent of O_2 and CO_2 is transported by the RBCs, respectively ?
 (A) 97%, 70% (B) 97%, 7% (C) 70%, 20–25% (D) 97%, 20–25%
100. How much percent of O_2 and CO_2 is carried in a dissolved state through the plasma, respectively?
 (A) 7%, 70% (B) 3%, 7% (C) 7%, 3% (D) 7%, 20–25%
101.a.....contain a very high concentration of carbonic anhydrase and minute quantities of the same is present in the.....b.....too.
 Fill in the blanks.
 (A) a–RBC, b–Plasma (B) a–Plasma, b–RBC
 (C) a–Hb, b–RBC (D) a–RBC, b–Serum

Space for Rough Work

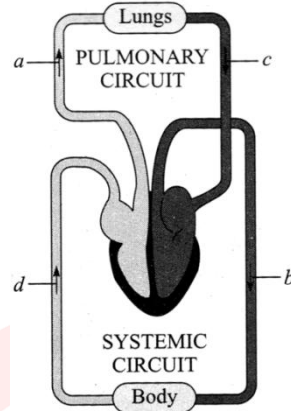
102. Recognize the figure and choose appropriate match.



- | | |
|----------------------------|----------------------------|
| i. Pulmonary artery | ii. Pulmonary veins |
| iii. Systemic arteries | iv. Systemic veins |
| (A) a-iv, b-iii, c-i, d-ii | (B) a-iii, b-iv, c-i, d-ii |
| (C) a-ii, b-i, c-iii, d-iv | (D) a-i, b-ii, c-iii, d-iv |
103. T-Wave represents
- | | |
|-----------------------------|----------------------------------|
| (A) Depolarisation of atria | (B) Depolarisation of Ventricles |
| (C) Repolarisation | (D) Both (A) and (B) |
104. Excitation (Depolarisation) of the atria is represented by
- | | | | |
|------------|-----------------|------------|------------|
| (A) P-Wave | (B) QRS-Complex | (C) T-Wave | (D) Q-Wave |
|------------|-----------------|------------|------------|

Space for Rough Work

105. Recognize the figure and give appropriate labelling from given options.

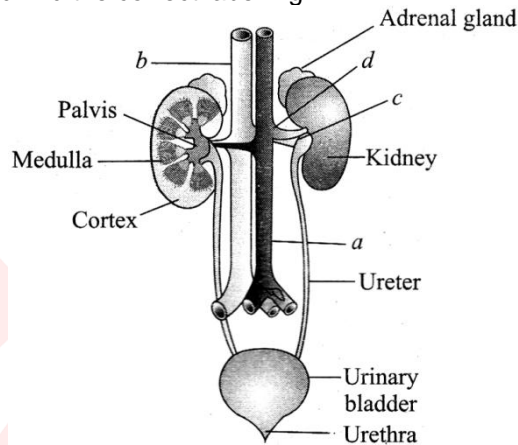


- | | |
|---------------------|--------------------|
| i. Pulmonary artery | ii. Pulmonary Vein |
| iii. Vena Cava | iv. Dorsal Aorta |
| a | b |
| b | c |
| (A) i | iii |
| (B) i | iv |
| (C) ii | iii |
| (D) ii | iv |

106. Normal blood pressure is
 (A) 120/80 (B) 80/120 (C) 140/80 (D) 140/70
107. Protonephridia or flame cells are the excretory structures in
 (A) Planaria (B) Some Rotifers and Annelids
 (C) Amphioxus (D) All of the above
108. Nephridia are tubular excretory structures of
 (A) Earthworms (B) Cockroaches (C) Other Annelids (D) Both (A) and (C)
109. Among the following which structure are unpaired in case of human excretory system
 a. Kidney b. Urethra c. Urinary bladder d. Ureter
 (A) b and c (B) b, c and d (C) a, c and d (D) b and d

Space for Rough Work

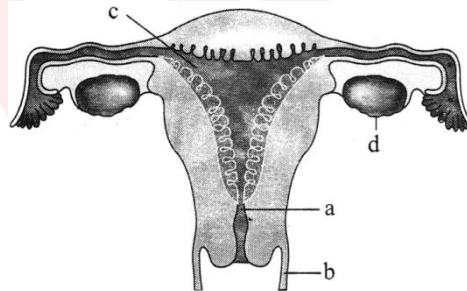
110. Recognize the figure and find the correct labelling.



- | | | | |
|-----------------|----------------|-------------------------|------------------|
| i. Renal Artery | ii. Renal vein | iii. Inferior vena cava | iv. Dorsal aorta |
| a | b | c | d |
| (A) iii | iv | i | ii |
| (B) iv | iii | i | ii |
| (C) iii | iv | ii | i |
| (D) iv | iii | ii | i |
111. Human skull is
 (A) Monocondylic (B) Dicondylic (C) Tricondylic (D) Quadricondylic
112. Hyoid bone is.....a.....Shaped andb.....
 (A) a–C shaped, b–Paired (B) a–U shaped, b–Paired
 (C) a–C shaped, b–Unpaired (D) a–U shaped, b–Unpaired
113. If the trophoblast layer failed to form in a mammalian embryo, which of the following structures would not develop?
 (A) The blastopore (B) The inner cell mass
 (C) The archenteron (D) The foetal placenta
114. The vertebral column of human is differentiated as the
 (A) C₇, T₁₂, L₅, S₅, Co₄ (B) C₇, T₁₂, L₅, S₄, Co₅
 (C) C₇, T₁₂, L₅, S₄, Co₁ (D) C₇, T₁₂, L₅, S₁, Co₁

Space for Rough Work

115. Which part of the brain connected to the spinal cord ?
 (A) Pons (B) Cerebellum
 (C) Medulla (D) Cerebral aqueduct
116. Holoblastic cleavage results in
 (A) Formation of a symmetrical blastula composed of cells of approximately equal size
 (B) Formation of an asymmetrical blastula composed of cells of approximately unequal size
 (C) Cell division of cells only near the animal pole
 (D) Cell division of only the cells near the vegetal pole
117. Which contraceptive method is effective at preventing fertilization and protecting against transmission of sexually transmitted diseases?
 (A) Oral contraceptives (B) Diaphragms
 (C) Nirodh (D) Intrauterine device (IUD)
118. The wall layer of eye ball which looks bluish in colour
 (A) Sclera (B) Choroid (C) Cornea (D) Retina
119. Which of the following structure forms the birth canal ?



- (A) a and b (B) b and c (C) c and d (D) a and d
120. Ovaries are located one on each side of
 (A) Lower pelvic region (B) Lower abdomen
 (C) Upper abdomen (D) Lower thoracic region

Space for Rough Work