TECHNO INDIA GROUP OF PUBLIC SCHOOLS

Dt. 11-10-2025

NEET (XI)

Monthly Mock Test - 4 (October-2025)

Time Allowed: **3 hours** Maximum Marks: **720**

General Instructions:

1. This test will be a 3 hours Test, Maximum Marks 720.
2. This test consists of 180 questions of Physics, Chemistry and Biology. All questions are COMPULSORY to attempt.
3. Each question is of 4 marks.
4. There are three parts in the question paper, consisting Part-I Physics (Q. No. 1 to 45), Part-II Chemistry (Q. no. 46 to 90), Part-III Biology (Q. no. 91 to 180).
5. There will be only one correct choice in the given four choices for each question. For each question 4 marks will be awarded for correct choice, 1 mark will be deducted for incorrect choice and zero mark will be awarded for unattempted question.
6. Any textual, printed or written material, mobile phones, calculator, etc. is not allowed for the students appearing for the test.
7. All calculations / written work should be done in the rough sheet provided.

Space For Rough Works

PHYSICS

1. Planet A has mass M and radius R. Planet B has double the mass and half the radius of planet A. If the escape velocities from the planets A and B are v_A and v_B respectively, then $\frac{v_A}{v_B}=\frac{n}{4}$. The value of n is

① 3 ② 1 ③ 2 ④ 4

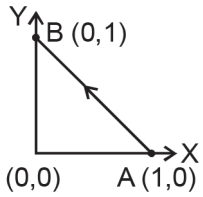
2. Consider a force $\vec{F}=-2x\,\hat{i}+2y\,\hat{j}$. The work done by this force in moving a particle from point A(1, 0) to B(0, 1) along the line AB is

① $\frac{3}{2}$

② 2

③ 1

④ $\frac{1}{2}$



3. A particle starts from the origin at t = 0 with an initial velocity of $3\hat{i}$ m/s and moves in the x-y plane with a constant acceleration $(6\hat{i}+16\hat{j})$ m/s^2. When its y-coordinate is 8 m, the displacement of particle is

① 6 m ② 8 m ③ 10 m ④ 14 m

4. A particle of mass m is fixed to one end of a light spring having force constant k and unstretched length *l*. The other end is fixed. The system is given an angular speed ω about the fixed end of the spring such that it rotates in a circle in gravity free space. Then the stretch in the spring is

① $\frac{m/\omega^2}{k-\omega m}$ ② $\frac{m/\omega^2}{k-m\omega^2}$ ③ $\frac{m/\omega^2}{k+m\omega^2}$ ④ $\frac{m/\omega^2}{k+m\omega}$

5. The basis of Bernoulli's theorem is conservation of

① mass ② momentum ③ energy ④ kinetic energy

6. A uniform solid sphere of mass 1 kg rolls without slipping on a plane horizontal surface with its centre moving at a speed of 10 m/s. Its kinetic energy is

① 28 J ② 14 J ③ 70 J ④ 35 J

7. Consider a particle of mass m which is driven by a machine that has a constant power k. What is the force on the particle at time t if the particle starts from the rest?

① $\sqrt{2mkt}^{1/2}$ ② $\frac{1}{2}\sqrt{mkt}^{-1/2}$ ③ $\sqrt{mkt}^{-1/2}$ ④ $\sqrt{\frac{mk}{2}}t^{-1/2}$

8. Three identical particles of equal mass M each are moving along a circle of radius R under the action of their mutual gravitational attraction, the speed of each particle is :

① $\sqrt{\frac{GM}{R}}$ ② $2\sqrt{\frac{GM}{\sqrt{3}R}}$ ③ $\sqrt{\frac{GM}{\sqrt{3}R}}$ ④ $\sqrt{\frac{GM}{\sqrt{2}R}}$

9. A uniform chain of length 2 m and mass 4 kg is kept on a table such that a length 60 cm hangs freely from the edge of the table. The work done in pulling the entire chain on the table is (Take g = 10m/s^2)

① 12.9 J ② 5.3 J ③ 3.6 J ④ 2.5 J

Cont.. 4

10. If length and radius of a wire both are doubled then the value of Young's modulus Y

① Will become double ② Will remain same

③ Will become half ④ Will become triple

11. What is the torque of a force $7\hat{i}+3\hat{j}-5\hat{k}$ about the origin? The force acts on a particle whose position vector is $\hat{i}-\hat{j}+\hat{k}$.

① $2\hat{i}+12\hat{j}-10\hat{k}$ ② $\hat{i}+12\hat{j}+10\hat{k}$ ③ $\hat{i}+10\hat{j}+10\hat{k}$ ④ $2\hat{i}+12\hat{j}+10\hat{k}$

12. There are 100 divisions in the circular scale of a screw gauge having pitch 1 mm. To measure the diameter of a wire, a student gets main scale reading 2 and circular scale reading 20. The diameter of the wire is

① 2.2 mm ② 2.02 mm ③ 2.20 mm ④ 2.020 mm

13. If $|\vec{P}\times\vec{Q}| = \sqrt{3}(\vec{P}\cdot\vec{Q})$, then $|\vec{P}+\vec{Q}|^2-|\vec{P}-\vec{Q}|^2 =$

① 4PQ ② 2PQ ③ PQ ④ 0

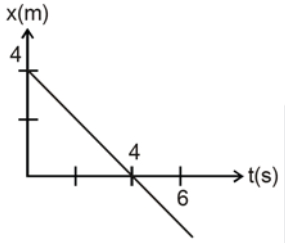
14. From the position (x) ~ time(t) graph given below find distance travelled in t = 6 sec.

① 2 m

② 8 m

③ 6 m

④ 10 m



15. A body of mass m_1 moving with a velocity 1 m/s suffers head on collision with another block of mass m_2 which is at rest. The collision is perfectly inelastic. In collision, the loss in kinetic energy is 1 J. Then

① $m_1 = 3$ kg, $m_2 = 6$ kg ② $m_1 = 6$ kg, $m_2 = 3$ kg

③ $m_1 = 2$ kg, $m_2 = 2$ kg ④ Options (1) and (2) both are true

16. A piece of stone weighs 50 gm in air, 40 gm in water and 42 gm in alcohol. The specific gravity of alcohol is

① 0.9 ② 0.8 ③ 0.75 ④ 0.85

17. Assuming the earth to be a sphere of uniform density and radius R. If the weight of a body on the surface is 200 N then the weight of the body at a height R from the earth's surface will be

① 100 N ② 50 N ③ 25 N ④ 20 N

18. A bullet fired into a fixed target loses one third of its velocity after penetrating 5 cm. How much further it will penetrate before coming to rest assuming that it faces constant resistance to motion?

① 4 cm ② 5 cm ③ 6 cm ④ 9 cm

19. When a spring is stretched by 3 cm, the potential energy stored is 9 J. To increase the spring further by 2 cm, the amount of required work done is

① 9 J ② 12 J ③ 15 J ④ 16 J

20. If the excess pressure inside a soap bubble of radius r in air is equal to the excess pressure inside air bubble of radius R inside soap solution, the ratio r:R is

① 1 : 2 ② 1 : 4 ③ 2 : 1 ④ 4 : 1

21. A thin cylindrical shell of radius r meter rolls without sliding, down an inclined plane of height 10 m and inclination 45°. It reaches the bottom of the plane with an angular speed 5 rad/s. To prevent sliding of the cylinder on the plane, the minimum value of the coefficient of static friction is μ_{min}. Then the value of $(\mu_{min} \times r)$ is (Take, $g = 10\ m/s^2$)

① 1 ② 2 ③ 3 ④ 4

22. Two identical blocks A and B move on smooth horizontal floor along x-axis with uniform velocities $(3m/s)\hat{i}$ and $(1m/s)\hat{i}$ respectively. At time t = 0, two blocks A and B are at x = 0 and x = 4 m respectively. Then they suffer perfectly elastic collision. Then at time t = 6 second the position of B is at

① x = 10 m ② x = 13 m ③ x = 18 m ④ x = 15 m

23. An object starts from rest and moves with uniform acceleration a. The final velocity of the particle in terms of the distance x covered by it is given as

① $\sqrt{2ax}$ ② 2 ax ③ $\sqrt{\frac{ax}{2}}$ ④ $\sqrt{ax}$

24. A train has to negotiate a curve of radius 2000 m. By how much should the outer rail be raised with respect to inner rail for a speed 72 km h^{-1} ? The distance between the rails is 1m.

① 2 cm ② 5 cm ③ 3.5 cm ④ 7.5 cm

25. A particle of mass 120 g has a velocity $\vec{v} = (2m/s)\hat{i} + (5m/s)\hat{j}$. Its kinetic energy is

① 3 J ② 4 J ③ 5 J ④ 1.74 J

26. The moment of intertia of a body depends upon

① mass of the body ② axis of rotation of the body

③ shape and size of the body ④ all of these

27. A bullet of mass 10 g moving horizontally with a speed of 400 ms^{-1} strikes a block of mass 390 g and remains in it. The block slides 10 m on rough horizontal surface before coming to rest. The friction coefficient is

① $\frac{1}{4}$ ② $\frac{1}{2}$ ③ $\frac{3}{4}$ ④ 4

28. N divisions on the main scale of vernier callipers coincide with (N + 1) divisions on the vernier scale. If each division on the main scale is of a units, determine the least count of the instrument.

① $\frac{a}{(N+1)}$ ② $\frac{3a}{4(N+1)}$ ③ $\frac{a}{N}$ ④ $\frac{a}{(N-1)}$

29. Water is flowing in a river at 2 ms^{-1}. The river is 50 m wide and has an average depth of 5 m. The power available from the current in the river is (Density of water = 1000 kg m^{-3})

① 0.5 M W ② 1 M W ③ 1.5 M W ④ 2 M W

30. A body is falling freely under the action of gravity. Which of the following quantities remain constant during the fall ?

① Kinetic energy ② Potential energy

③ Total mechanical energy ④ Total linear momentum

31. For continuous mass distribution, if the centre of mass lies at the origin, then choose the correct option.

① $\vec{R}_{CM} = \vec{0}$ ② $\int r\, dm = 0$

③ $\int x\, dm = \int y\, dm = \int z\, dm = 0$ ④ all of the above

32. A stone is dropped from a height h. Simultaneously, another stone is thrown vertically upward from the ground which reaches a height 4h. The two stones cross each other after time

① $\sqrt{\frac{h}{8g}}$ ② $\sqrt{8gh}$ ③ $\sqrt{2gh}$ ④ $\sqrt{\frac{h}{2g}}$

33. A 60 kg monkey, climbs on a rope which can withstand a maximum tension of 900 N. The rope will snap if the monkey [Take, $g = 9.8\ m/s^2$]

① Climbs up with an acceleration of $7\ m/s^2$ ② Climbs down with an acceleration of $6\ m/s^2$

③ Climbs up with uniform speed of $5\ m/s^2$ ④ Falls down the rope nearly freely under gravity

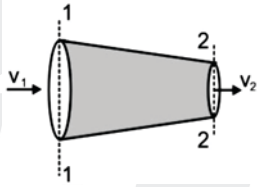
34. Water is flowing steadily through a horizontal pipe of a non-uniform cross-section. If the pressure of water is $4 \times 10^4\ Nm^{-2}$ at a point where cross section is $0.02\ m^2$ and velocity of flow is $2\ ms^{-1}$. What is the pressure at a point where cross-section reduces to $0.01\ m^2$?

① $2 \times 10^5\ N\ m^{-2}$

② $7.5 \times 10^6\ N\ m^{-2}$

③ $4.5 \times 10^5\ N\ m^{-2}$

④ $3.4 \times 10^4\ N\ m^{-2}$



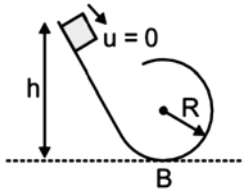
35. A pump motor is used to deliver water at a certain rate from a given pipe. To obtain n times water from the same pipe in the same time, by what amount should the power of the motor be increased ?

① n^2 times ② n^3 times ③ n times ④ $n^{3/2}$ times

36. A block is released from height h on a smooth track. Find the minimum value of h so that it completes the vertical circle of radius R.

① $\frac{R}{2}$ ② $\frac{7R}{2}$

③ $\frac{3R}{2}$ ④ $\frac{5R}{2}$



37. In a ground to ground projection, the projectile is at point A at time $t_1 = \frac{T}{3}$, at point B at time $t_2 = \frac{5T}{6}$ and reaches the ground at time t = T. The difference in heights between points A and B is

① $\frac{gT^2}{6}$ ② $\frac{gT^2}{12}$ ③ $\frac{gT^2}{18}$ ④ $\frac{gT^2}{32}$

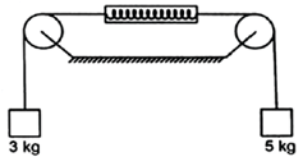
38. If all the pulleys and strings are ideal, then the reading of spring balance in given situation is ($g = 10\ m/s^2$)

① 3 kg-wt

② 5 kg-wt

③ 8 kg-wt

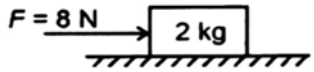
④ 3.75 kg-wt



39. A block of mass 2 kg is placed on the floor. The coefficient of static friction between the block and the floor is 0.6. A horizontal force F is acting on it as shown in the figure. The frictional force on the block is

① Zero ② 12 N

③ 2 N ④ 8 N



40. At a depth x and at height x from the earth's surface, values of g are equal. Then $\frac{x}{R}$ is (R : radius of the earth)

① $\frac{1}{2}$ ② $\frac{2}{3}$ ③ $\frac{\sqrt{3}+1}{2}$ ④ $\frac{\sqrt{5}-1}{2}$

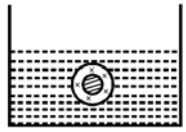
41. An iron (relative density 8.875) ball of radius 1cm is coated with wax (relative density 0.875). If the combination floats inside water then thickness of coating of wax is

① 3 cm

② 1 cm

③ 2 cm

④ 4 cm



42. A point P lies on the axis of a ring of mass M and radius 'a' at a distance 'a' from its centre C. A small particle start from P and reaches C under gravitational attraction. Its speed at C will be

① $\sqrt{\frac{2GM}{a}}$ ② $\sqrt{\frac{2GM}{a}\left(1-\frac{1}{\sqrt{2}}\right)}$ ③ $\sqrt{\frac{2GM}{a}(\sqrt{2}-1)}$ ④ Zero

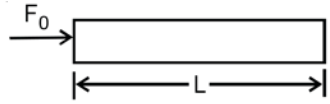
43. When a viscous liquid flows at a rate Q through a capillary tube of radius r placed horizontally and the flow is laminar, pressure difference P develops across the ends of the tube. If the radius of the tube is doubled and the rate of flow halved, the pressure difference will be

① 8P ② P ③ $\frac{P}{8}$ ④ $\frac{P}{32}$

44. A uniform rod of Young's modulus Y pushed over a smooth horizontal surface by a constant horizontal force F_0. The area of cross-section of the rod is A. The compressive strain on the rod is

① $\frac{F_0}{AY}$ ② $\frac{F_0}{2AY}$

③ $\frac{2F_0}{AY}$ ④ $\frac{2F_0}{3AY}$



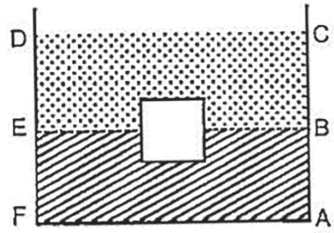
45. The liquid in lower level has specific gravity 16 and the liquid in upper level has density 10^3 kg m^{-3}. The block is made up of material of density 6×10^3 kg m^{-3}. What fraction of the volume of block is submerged in lower liquid?

① $\frac{2}{3}$

② $\frac{1}{3}$

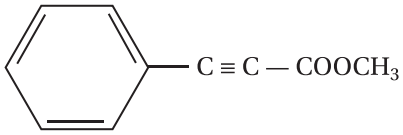
③ $\frac{1}{2}$

④ $\frac{3}{4}$



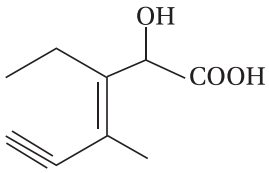
CHEMISTRY

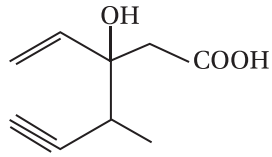
46. How many (i) sp^2 hybridised carbon atoms and (ii) π-bonds are present in the following compounds?

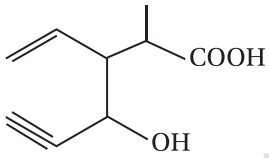


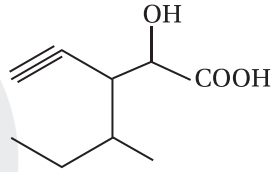
① 7, 5 ② 8, 6 ③ 7, 6 ④ 8, 5

47. Structure of the compound whose I.U.P.A.C. name is 3–ethyl–2–hydroxy–4–methylhex–3–ene–5 ionic acid is:

① 

② 

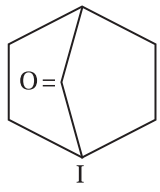
③ 

④ 

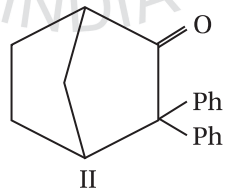
48. The correct order of decreasing acidic strength of trichloroacetic acid (A), trifluoroacetic acid (B), acetic acid (C) and formic acid (D) is:

① B > A > D > C ② B > D > C > A ③ A > B > C > D ④ A > C > B > D

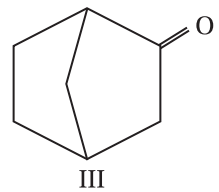
49. Which among the given molecules can exhibit tautomerism?



I



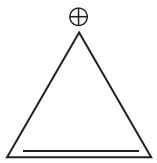
II

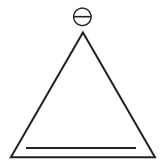


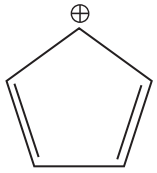
III

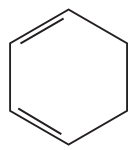
① III only ② Both I and III ③ Both I and II ④ Both II and III

50. Which of the following is most stable?

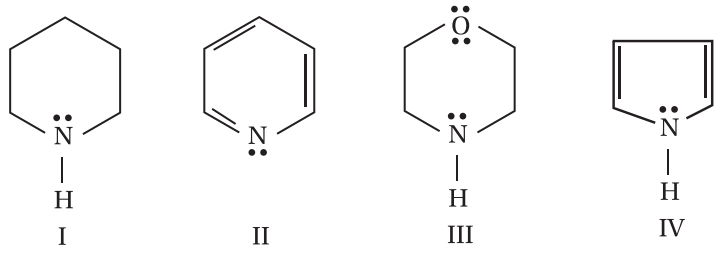
① 

② 

③ 

④ 

51. Which of the following is the most basic compound?



I II III IV

① IV ② III ③ II ④ I

52. Equal volumes of two solutions one having pH = 6 and other having pH = 4 are mixed. The pH of the resulting solution would be: $[\log_{10}2 = 0.3]$

① 5.7 ② 4.3 ③ 5.0 ④ 5.5

53. The entropy change in the fusion of one mole of a solid melting at 27°C (latent heat of fusion is 2930 J $mole^{-1}$) is:

① 9.77 $J(K)^{-1}(mol)^{-1}$ ② 10.73 $J(K)^{-1}(mol)^{-1}$ ③ 2930 $J(K)^{-1}(mol)^{-1}$ ④ 108.5 $J(K)^{-1}(mol)^{-1}$

54. For the reaction $2Cl(g) \longrightarrow Cl_2(g)$, the correct option is:

① $\Delta_rH > O$ and $\Delta_rS < O$ ② $\Delta_rH < O$ and $\Delta_rS > O$

③ $\Delta_rH < O$ and $\Delta_rS < O$ ④ $\Delta_rH > O$ and $\Delta_rS < O$

55. Oxygen has an oxidation state of +2 in:

① H_2O_2 ② H_2O ③ OF_2 ④ SO_2

56. The reaction $2Cu^+ \longrightarrow Cu^{2+} + Cu$ is an example of:

① Oxidation reaction ② Reduction reaction

③ Disproportion reaction ④ Neutralization reaction

57. How many moles of $KMnO_4$ reacted with one mole of ferrous oxalate in acidic medium?

① $\frac{2}{5}$ ② $\frac{1}{5}$ ③ $\frac{3}{5}$ ④ $\frac{3}{5}$

Assertion–Reason Questions (Q.58–Q.65):

(A) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(B) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(C) (A) is correct but (R) is not correct

(D) (A) is not correct but (R) is correct

58. Assertion: Oxidation state of nickel in $[Ni(CO)_4]$ is zero

Reason: Nickel is co-ordinated to neutral carbonyl ligand

① a ② b ③ c ④ d

59. **Assertion:** In the reaction, $3Cl_2 + I_2 \rightarrow 2ICl_3$ chlorine has been oxidise while iodine has been reduced

Reason: Gain of electron is reduction while the loss of electron is oxidation.

① a ② b ③ c ④ d

60. **Assertion:** Oxidation state of sulphur in H_2SO_5 is +6.

Reason: H_2SO_5 is commonly known as caro's acid, it has one peroxy linkage.

① a ② b ③ c ④ d

61. **Assertion:** Oxidation state of iron in $K_3[Fe(CN)_6]$ is greater than that of $K_4[Fe(CN)_6]$.

Reason: Co-ordination state of both $K_4[Fe(CN)_6]$ and $K_3[Fe(CN)_6]$ are same

① a ② b ③ c ④ d

62. **Assertion:** Oxidation state of oxygen in OF_2 is +2.

Reason: Fluorine is more electronegative than oxygen.

① a ② b ③ c ④ d

63. **Assertion:** KO_2 is super oxide.

Reason: Oxidation state of oxygen in KO_2 is –2.

① a ② b ③ c ④ d

64. **Assertion:** Empirical formula of formaldehyde and glucose are same.

Reason: Oxidation states of carbon in both formaldehyde and glucose are zero.

① a ② b ③ c ④ d

65. **Assertion:** When benzaldehyde is treated with aqueous NaOH, cannizaro reaction takes place.

$$\underset{\text{(Benzaldehyde)}}{2C_6H_5CHO} \xrightarrow{NaOH(aq)} \underset{\text{(Benzylalcohol)}}{C_6H_5CH_2OH} + \underset{\text{(Sodium benzoate)}}{C_6H_5CH_2OH}$$

Reason: Cannizaro reaction is a disproportion reaction.

① a ② b ③ c ④ d

66. The pH of an aqueous solution of 0.1M solution of a weak monoprotic acid which is 1% ionised is:

① 1 ② 2 ③ 3 ④ 4

67. In the hydrolysis of a salt of weak acid and strong base the hydrolysis constant K_a is equal to:

① $\frac{K_w}{K_a}$ ② $\frac{K_w}{K_h}$ ③ $\sqrt{\frac{K_a}{C}}$ ④ $\frac{K_w}{K_a \propto K_b}$

68. In the hydrolysis of a salt of weak acid and weak base the hydrolysis constant K_h is equal to

① $\frac{K_w}{K_b}$ ② $\frac{K_w}{K_a}$ ③ $\frac{K_w}{K_a \times K_b}$ ④ $K_a \cdot K_b$

69. Solution of 0.1(N) NH_4OH and 0.1(N) NH_4Cl has pH 9.25. pK_b of NH_4OH is:

① 9.25 ② 4.75 ③ 3.75 ④ 8.25

70. What is the pH value at which $Mg(OH)_2$ begins to precipitate from a solution containing 0.10(M) Mg^{2+} ions. K_{sp} of $Mg(OH)_2$ is 1×10^{-11} ?

① 3 ② 6 ③ 9 ④ 11

71. 2 moles of N_2 is mixed with 6 moles of H_2 in a closed vessel of 1 litre capacity. If 50% N_2 is converted into NH_3 at equilibrium, the value of K_C for the reaction is: $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

① $\frac{4}{27}$ ② $\frac{27}{4}$ ③ $\frac{1}{27}$ ④ 27

72. For the reaction A + B $\rightleftharpoons$ 2C, at the equilibrium concentration of A and B each is 0.20 mole/litre and concentration C is observed as 0.60 mole/litre. Equilibrium constant (K_C) will be

① 9 ② 18 ③ 0.92 ④ 0.26

73. The dissociation constant of an acid is 10^{-5}. The pH of its 0.1M solution will be approximately:

① 6 ② 4 ③ 3 ④ 5

74. If ionisation constant of acetic acid is 1.8×10^{-5}, at what concentration will it be dissociated to 2%?

① 1M ② 0.018M ③ 0.18M ④ 0.045M

75. What is the weight of oxygen required for the complete combination of 2.8 Kg of ethylene?

① 2.8 Kg ② 6.4 Kg ③ 9.6 Kg ④ 96 Kg

76. The number of moles of $KMnO_4$ reduced by one mole of KI in alkaline medium is:

① one-fifth ② five ③ one ④ two

77. The density of 2(M) aqueous solution of NaOH is 1.28 g/cm^3. The molality of the solution is [Given that molecular mass of NaOH = 40 g(mole)$^{-1}$]

① 1.20 m ② 1.50 m ③ 1.67 m ④ 1.32 m

78. The energy of an electron in the ground state (n = 1) for He^+ ion is –x J., then that for an electron in n = 2 state for Be^{3+} ion in J is:

① –x ② $-\frac{x}{9}$ ③ –4x ④ $-\frac{4}{9}x$

79. Maximum number of electrons in a subshell with $l = 3$, and n = 4 is:

① 14 ② 16 ③ 10 ④ 12

80. Arrange the following elements in increasing order of first ionisation enthalpy: Li, Be, B, C, N

Choose the correct answer from the options given:

① Li < Be < B < C < N ② Li < B < Be < C < N

③ Li < Be < C < B < N ④ Li < Be < N < B < C

81. Arrange the following elements in increasing order of electronegativity: N, O, F, C, Si

① Si < C < N < O < F ② Si < C < O < N < F

③ O < F < NCC < Si ④ F < O < N < C < Si

82. Amongst the following which one will have maximum 'lone pair – lone pair' electron repulsion?

① IF_5 ② SF_4 ③ XeF_2 ④ ClF_3

83. Which of the following options represents the correct bond order?

① $O_2^- > O_2 > O_2^+$ ② $O_2^- < O_2 < O_2^+$ ③ $O_2^- > O_2 < O_2^+$ ④ $O_2^- < O_2 > O_2^+$

84. Calculate the pH of each of the following solutions when 100 ml of 0.1 (M) CH_3COOH mixed with 100 ml of 0.1 M NaOH (Given pka = 4.75)

① 2.78 ② 7.28 ③ 8.72 ④ 7.23

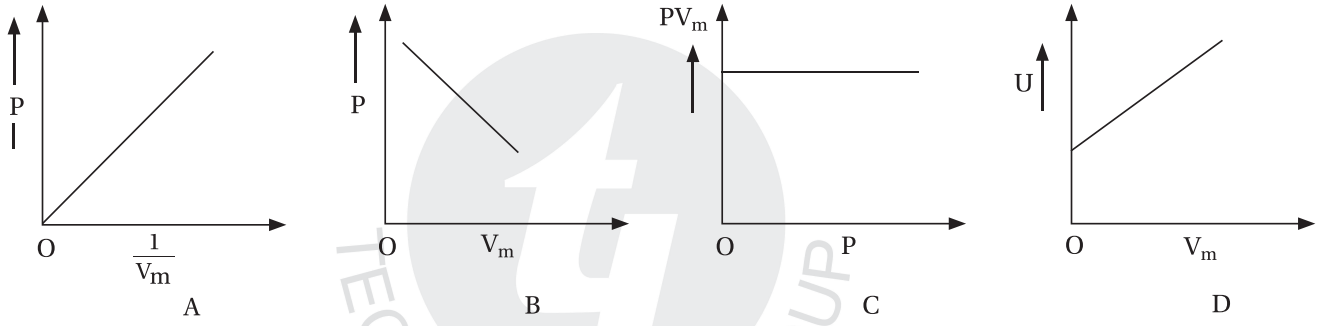
85. $(K_{sp})_{AgCl}$ is 2.8×10^{-10} at 25°C. Calculate the solubility of AgCl is 0.1 M $AgNO_3$ (miles/L):

① 2.8×10^{-10} ② 2.8×10^{-11} ③ 2.8×10^{-9} ④ 5.6×10^{-9}

86. The internal energy change when a system goes from state A to B is 40 kj/mole, if the system goes from A to B by reversible path and returns to state A by an irreversible path. What would be the net change in internal energy?

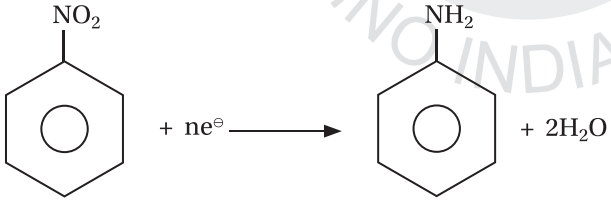
① > 40 K j ② < 40 K j ③ Zero ④ 40 K j

87. The combination of plots which does not represent isothermal expansion of an ideal gas is:



① B & D ② A & C ③ B & C ④ A & D

88.



For converting one mole of nitrobenzene to aniline, how many moles of electrons are transferred?

① 2 ② 3 ③ 6 ④ 8

Assertion–Reason Questions (Q.89–Q.90):

(A) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(B) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(C) (A) is correct but (R) is not correct

(D) (A) is not correct but (R) is correct

89. Assertion: In the E_2 elimination, β–H and leaving group should be antiperiplanar.

Reason: In the E_2 elimination, base always abstracts unhindered β–H.

① a ② b ③ c ④ d

90. **Assertion:** A mixture of plant pigments can be separated by chromatography.

Reason: Chromatography is used for the separation of coloured substances into individual components.

① a ② b ③ c ④ d

Biology

91. Which of the following is true for nucleolus?

Ⓐ Larger nucleoli are present in dividing cells
Ⓑ It is membrane bound
Ⓒ It takes part in spindle formation
Ⓓ It is a site for active ribosomal RNA synthesis

92. The golgi complex participates in

Ⓐ Fatty acid breakdown
Ⓑ Formation of secretory vesicles
Ⓒ Respiration in bacteria
Ⓓ Activation of amino acid

93. Which of the following events does not occur in RER?

Ⓐ Protein folding
Ⓑ Protein glycosylation
Ⓒ Cleavage of signal peptide
Ⓓ Phospholipid synthesis

94. Many ribosomes may associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are called:

Ⓐ Polysome Ⓑ Polyhedral bodies Ⓒ Plastidome Ⓓ Nucleosome

95. Select the incorrect match:

Ⓐ Lampbrush chromosomes – Duplicate bivalents
Ⓑ Allosomes – Sex chromosomes
Ⓒ Submetacentric chromosomes – L-shaped chromosomes
Ⓓ Polytene chromosomes – Oocytes of amphibians

96. Which of the following sex organelles is responsible for extracting energy from carbohydrates to form ATP?

Ⓐ Lysosome Ⓑ Ribosome Ⓒ Chloroplast Ⓓ Mitochondria

97. Which of the following components provide sticky character to the bacterial cell?

Ⓐ Cell wall Ⓑ Nuclear membrane Ⓒ Cell membrane Ⓓ Glycocalyx

98. The correct sequence of involvement of cell organelles in secretion of proteins from the cell is:

Ⓐ Nucleus → ER → Ribosomes → Golgi apparatus → Secretory vesicles → Plasma membrane
Ⓑ Nucleus → Ribosomes → ER → Golgi apparatus → Secretory vesicles → Plasma membrane
Ⓒ Nucleus → Ribosomes → ER → Lysosomes → Plasma membrane
Ⓓ Nucleus → ER → Ribosomes → Golgi apparatus → Lysosomes → Plasma membrane

99. The type of ribosome is same in:

Ⓐ Eukaryotic cytoplasm, mitochondria and ER
Ⓑ Cytoplasm of eukaryotic cells, their mitochondria and chloroplasts

Cont.. 14

Ⓒ Cytoplasm of eukaryotic cells, their chloroplasts and microbodies

Ⓓ Prokaryotes, mitochondria and chloroplasts

100. Reserved materials in prokaryotic cells is stored as:

Ⓐ Basal body Ⓑ Inclusion bodies Ⓒ Mesosome Ⓓ Polysome

101. Select the wrong statement:

Ⓐ Cyanobacteria lack flagellated cells

Ⓑ Mycoplasma is a wall less microorganism

Ⓒ Bacterial cell wall is made up of peptidoglycan

Ⓓ Pilli and fimbriae are mainly involved in motility of bacteria

102. Select the mismatch:

Ⓐ Protists – Eukaryotes Ⓑ Methanogens – Prokaryotes

Ⓒ Gas vacuoles – Green bacteria Ⓓ Large central vacuoles – Animal cells

103. Microtubules are constituents of:

Ⓐ Cilia, Flagella and Peroxisomes Ⓑ Spindle fibres, Centrioles and Cilia

Ⓒ Centrioles, Spindle fibres and Chromatin Ⓓ Centrosome, Nucleosome and Centrioles

104. Spindle fibres attach to:

Ⓐ Telomere of the chromosome Ⓑ Kinetochore of the chromosome

Ⓒ Centromere of the chromosome Ⓓ Kinetosome of the chromosome

105. Mitochondria and chloroplasts are:

a. Semi autonomous organelles

b. Formed by division of preexisting organelles and they contain DNA, but lack protein synthesising machinery

Which of the following options is correct?

Ⓐ Both a and b are correct Ⓑ b is true but a is false

Ⓒ a is true but b is false Ⓓ Both a and b are false

106. Which one of the following is not an inclusion body found in prokaryotes?

Ⓐ Glycogen granule Ⓑ Polysome

Ⓒ Phosphate ganule Ⓓ Cyanophycean granule

107. The chromosome in which the centromere is situated close to one end is:

Ⓐ Telocentric Ⓑ Submetacentric Ⓒ Metacentric Ⓓ Acrocentric

108. Nuclear envelope is derived from:

Ⓐ Microtubules Ⓑ ER

Ⓒ Lysosomes Ⓓ Membrane of Golgi complex

109. Match the columns and identify the correct option:

Column – I		Column – II	
(a)	Thylakoids	(i)	Disc shaped sacs in Golgi Apparatus
(b)	Cristae	(ii)	Condensed structure of DNA
(c)	Cisteranae	(iii)	Flat membranous sacs in stroma
(d)	Chromatin	(iv)	Infoldings of mitochondria

Ⓐ (a) – (iii), (b) – (iv), (c) – (i), (d) – (ii)
Ⓑ (a) – (iii), (b) – (i), (c) – (iv), (d) – (ii)
Ⓒ (a) – (iii), (b) – (iv), (c) – (ii), (d) – (i)
Ⓓ (a) – (iv), (b) – (iii), (c) – (i), (d) – (ii)

110. Cellular organelles with membranes are

Ⓐ Chromosomes, ribosomes and ER
Ⓑ ER, ribosomes and nucleus
Ⓒ Lysosomes, Golgi apparatus and mitochondria
Ⓓ Nucleus, ribosome and mitochondira

111. Balbiani rings are sites of:

Ⓐ Nucleotide synthesis
Ⓑ Polysaccharide synthesis
Ⓒ RNA and protein synthesis
Ⓓ Lipid synthesis

112. Chromatophores take part in:

Ⓐ Growth Ⓑ Movement Ⓒ Respiration Ⓓ Photosynthesis

113. The structures that help some bacteria to attach to rocks/host tissue is:

Ⓐ Fimbriae Ⓑ Mesosomes Ⓒ Holdfast Ⓓ Rhizoids

114. The solid, linear, cytoskeletal elements, having a diameter of 6 nm and made up of a single type of monomer is called:

Ⓐ Lamins
Ⓑ Microtubules
Ⓒ Microfilaments
Ⓓ Intermediate filaments

115. The osmotic expansion of a cell kept in water, is chiefly regulated by:

Ⓐ Ribosomes Ⓑ Mitochondria Ⓒ Vacuoles Ⓓ Plastids

116. The two functional groups, characteristic of sugars, are:

Ⓐ Hydroxyl and methyl
Ⓑ Carboxyl and methyl
Ⓒ Carboxyl and phosphate
Ⓓ Carboxyl and hydroxyl

117. A fat molecule is formed from:

Ⓐ Three glycerol molecules and one fatty acid molecule
Ⓑ One glycerol molecules and one fatty acid molecule
Ⓒ Three glycerol molecules and three fatty acid molecules
Ⓓ One glycerol molecule and three fatty acid molecules

118. Which one of the following statements is incorrect?

Ⓐ The competitive inhibitor does not affect the rate of breakdown of the enzyme substrate complex

Cont.. 16

Ⓑ The presence of the competitive inhibitor decreases the Km of the enzyme for the substrate

Ⓒ A competitive inhibitor reacts with the enzyme to form an enzyme inhibitor complex

Ⓓ In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme

119. The essential chemical component of many coenzymes are:

Ⓐ Vitamins Ⓑ Proteins Ⓒ Nucleic acids Ⓓ Carbohydrates

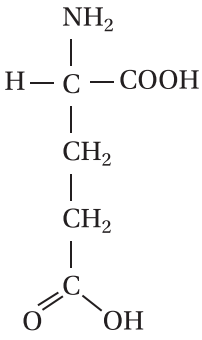
120. For its activity, carboxypeptidase requires

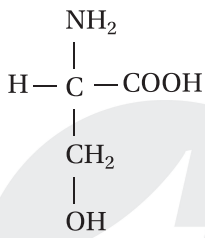
Ⓐ Zinc Ⓑ Iron Ⓒ Niacin Ⓓ Copper

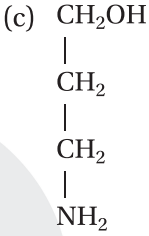
121. Which one is the most abundant protein in the animal world?

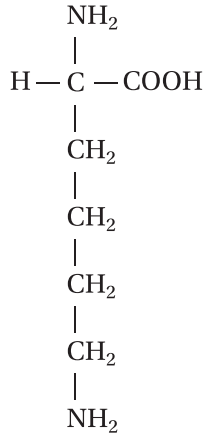
Ⓐ Insulin Ⓑ Trypsin Ⓒ Haemoglobin Ⓓ Collagen

122. Which one out of A–D correctly represents the structural formula of a basic amino acid?

(a) 

(b) 

(c) 

(d) 

Ⓐ b Ⓑ c Ⓒ d Ⓓ a

123. Which of the following properties of starch makes it useful as a storage material?

1. Easily translocated 2. Chemically non-reactive 3. Easily digested by animals

4. Osmotically inactive 5. Synthesised during photosynthesis

Ⓐ 1, 3 and 5 Ⓑ 1 and 5 Ⓒ 2 and 3 Ⓓ 2 and 4

124. An organic substance bound to an enzyme and essential for its activity is:

Ⓐ Isoenzyme Ⓑ Coenzyme Ⓒ Apoenzyme Ⓓ Holoenzyme

125. Catalytic efficiency of two different enzymes is compared by their:

Ⓐ Product Ⓑ Molecular size Ⓒ Km value Ⓓ pH optimum value

126. The stage during which separation of the paired homologous chromosomes begins is:

Ⓐ Pachytene Ⓑ Diplotene Ⓒ Diakinesis Ⓓ Zygotene

127. Anaphase promoting complex (APC) is a protein degradation machinery necessary for proper mitosis of animal cells. If APC is defective in a human cell, which of the following is expected to occur?

Ⓐ Chromosomes will not condense Ⓑ Chromosomes will be fragmented

Ⓒ Chromosomes will not segregate Ⓓ Recombination of chromosome arms will occur

128. Which of the following statements is correct with respect to cell cycle?

Ⓐ DNA content of cell remains constant during the entire cell cycle

Ⓑ A cell in G_1 phase has double the amount of DNA than a cell in G_2 phase

Ⓒ Each chromosome has two chromatids in G_1 phase

Ⓓ Nerve cells in adult humans are in G_0 state

129. At what phase of meiosis, homologous chromosomes are separated?

Ⓐ Anaphase II Ⓑ Prophase I Ⓒ Prophase II Ⓓ Anaphase I

130. In meiosis, crossing over is initiated at:

Ⓐ Pachytene Ⓑ Leptotene Ⓒ Zygotene Ⓓ Diplotene

131. At which stage of meiosis, is the enzyme, recombinase, required?

Ⓐ Diakinesis Ⓑ Pachytene Ⓒ Zygotene Ⓓ Diplotene

132. During which phase(s) of cell cycle, amount of DNA in a cell remains at 4C level, if the initial amount is denoted as 2C?

Ⓐ G_2 and M Ⓑ G_0 and G_1 Ⓒ G_1 and S Ⓓ Only G_2

133. The complex formed by a pair of synapsed homologous chromosomes is called:

Ⓐ Axoneme Ⓑ Equatorial plate Ⓒ Kinetochores Ⓓ Bivalent

134. Identify the meiotic stage in which the homologous chromosomes separate, while the sister chromatids remains associated at their centromeres:

Ⓐ Metaphase I Ⓑ Metaphase II Ⓒ Anaphase I Ⓓ Anaphase II

135. Given below is the representation of a certain event at a particular stage of a type of cell division. Which is this stage?

Prophase I

Ⓐ Both prophase and metaphase of mitosis Ⓑ Prophase I during meiosis

Ⓒ Prophase II during meiosis Ⓓ Prophase of mitosis

136. Which one of the following animals is correctly matched with its particular named taxonomic category?

Ⓐ Housefly – *Musca*, an order Ⓑ Tiger – *tigris*, the species

Ⓒ Cuttlefish – Mollusca, a class Ⓓ Humans – Primata, the family

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137. Phylogenetic system of classification is based on:

Ⓐ Morphological features
Ⓑ Chemical constituents
Ⓒ Evolutionary relationships
Ⓓ Floral characters

138. ICBN is:

Ⓐ International Code for Biological Naming
Ⓑ International Code for Botanical Nomenclature
Ⓒ International Class for Biological Nomenclature
Ⓓ International Classification for Biological Nomenclature

139. Species are considered as:

Ⓐ Real basic units of classification
Ⓑ The lowest unit of classification
Ⓒ Artificial concept of human mind
Ⓓ Real units of classification devised by taxonomists

140. Which of the following are less general in characters as compared to genus?

Ⓐ Species Ⓑ Division Ⓒ Class Ⓓ Family

141. The term 'phylum' was given by:

Ⓐ Cuvier Ⓑ Haeckel Ⓒ Theophrastus Ⓓ Linnaeus

142. A taxon is:

Ⓐ A group of related families
Ⓑ A group of related species
Ⓒ A type of living organism
Ⓓ A taxonomic group of any ranking

143. Which of the following are found in extreme saline conditions?

Ⓐ Archaebacteria Ⓑ Eubacteria Ⓒ Cyanobacteria Ⓓ Mycobacteria

144. Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants, as well as animals, and can survive without oxygen?

Ⓐ *Bacillus* Ⓑ *Pseudomonas* Ⓒ Mycoplasma Ⓓ *Nostoc*

145. Viriods differ from viruses in having:

Ⓐ DNA molecules with protein coat
Ⓑ DNA molecules without protein coat
Ⓒ RNA molecules with protein coat
Ⓓ RNA molecules without protein coat

146. An example of flagellate protozoan is:

Ⓐ *Paramoecium* Ⓑ *Trypanosoma* Ⓒ *Entamoeba* Ⓓ *Plasmodium*

147. Which of the following is not true of organisms in the Kingdom Monera?

Ⓐ They originated atleast 3.5 billion years ago
Ⓑ They have prokaryotic cellular organisation
Ⓒ They may be autotrophic or heterotrophic in nature
Ⓓ They reproduce by mitosis

148. Select the sac fungus:

Ⓐ *Albugo* Ⓑ *Agaricus* Ⓒ *Neurospora* Ⓓ *Mucor*

149. In which group of organisms, the cell wall forms two thin overlapping shells which fit together?

Ⓐ Euglenoids Ⓑ Dinoflagellates Ⓒ Slime moulds Ⓓ Chrysophytes

150. Five Kingdom System of Classification, suggested by R.H. Whittaker, is not based on:

Ⓐ Complexity of body organisation
Ⓑ Presence or absence of a well defined nucleus
Ⓒ Mode of reproduction
Ⓓ Mode of nutrition

151. Which of the following statement is correct?

Ⓐ Ovules are not enclosed by ovary wall in gymnosperms
Ⓑ *Selaginella* is heterosporous, while *Salvinia* is homosporous
Ⓒ Horsetails are gymnosperms
Ⓓ Stems are usually umbranched in both *Cycas* and *Cedrus*

152. Select the mismatch:

Ⓐ *Pinus* – Dioecious
Ⓑ *Cycas* – Dioecious
Ⓒ *Salvinia* – Heterosporous
Ⓓ *Equisetum* – Homosporous

153. An example of colonial alga is

Ⓐ *Chlorella* Ⓑ *Volvox* Ⓒ *Ulothrix* Ⓓ *Spirogyra*

154. Which one of the following statements is wrong?

Ⓐ Agar – agar is obtained from *Gelidium* and *Gracilaria*
Ⓑ *Laminaria* and *Sargassums* are used as food
Ⓒ Algae increase the level of dissolved oxygen in the immediate environment
Ⓓ Algin is obtained from red algae, and carrageen from brown algae

155. Conifers are adapted to tolerate extreme environmental conditions because of:

Ⓐ Thick cuticle Ⓑ Presence of vessels Ⓒ Broad hardy leaves Ⓓ Superficial stomata

156. Select the correct statement:

Ⓐ Gymnosperms are both homosporous and heterosporous
Ⓑ *Salvinia, Gingko* and *Pinus* all are gymnosperms
Ⓒ *Sequoia* is one of the tallest trees
Ⓓ The leaves of gymnosperms are not well adapted to extremes of climates

157. Which one is a wrong statement?

Ⓐ *Mucor* has biflagellate zoospores
Ⓑ Haploid endosperm is typical feature of gymnosperms
Ⓒ Brown algae have chlorophyll a and c and fucoxanthin
Ⓓ Archegomia are found in Bryophyta, Pteridophyta and Gymnosperms

158. *Cycas* and *Adiantum* resemble each other in having:

Ⓐ Vessels Ⓑ Seeds Ⓒ Motile sperms Ⓓ Cambium

159. Mannitol is storage food in:

Ⓐ *Gracilaria* Ⓑ *Chara* Ⓒ *Porphyra* Ⓓ *Fucus*

160. Moss peat is used as a packing material for sending flowers and live plants to distant places because:

Ⓐ It serves as disinfectant Ⓑ It is hygroscopic

Ⓒ It is easily available Ⓓ It reduces transpiration

161. Which one of the following statements about certain given animals is correct?

Ⓐ Molluscs are acoelomates Ⓑ Insects are pseudocoelomates

Ⓒ Flatworms are coelomates Ⓓ Roundworms are pseudocoelomates

162. One example of animal having a single opening to the outside that serves both as mouth, as well as anus, is:

Ⓐ *Asterias* Ⓑ *Ascidia* Ⓒ *Fasciola* Ⓓ Octopus

163. Which one is the group of bilaterally symmetrical and triploblastic animals?

Ⓐ Sponges Ⓑ Coelenterates Ⓒ Ctenophores Ⓓ Aschelminthes

164. Which one pair comprises jawless fishes?

Ⓐ Mackarels and Rohu Ⓑ Lampreys and Hagfishes

Ⓒ Lampreys and Eels Ⓓ Guppies and Hagfishes

165. A feature absent in annelids is:

Ⓐ Clitellum Ⓑ Pseudocoelom

Ⓒ Nephridia Ⓓ Metameric segmentation

166. *Ascaris* is characterised by:

Ⓐ Presence of true coelom but absence of metamerism

Ⓑ Presence of neither true coelom nor metamerism

Ⓒ Presence of true coelom and metamerism

Ⓓ Absence of true coelom but presence of metamerism

167. What is common among parrot, platypus and Kangaroo?

Ⓐ Toothless jaws Ⓑ Functional post and tail

Ⓒ Oviparity Ⓓ Homeothermy

168. Which one is mismatched pair?

Ⓐ *Apis indica* – Honey Ⓑ *Kerria laca* – Lac

Ⓒ *Bombyx mori* – Silk Ⓓ *Pila globosa* – Pearl

169. What is true about *Neries,* Scorpion, Cockroach and Silver Fish?

Ⓐ All possess dorsal heart Ⓑ None is aquatic

Ⓒ They belong to same phylum Ⓓ They have jointed paired appendages

170. Pick up the matching pair of body feature and the animal possessing it:

Ⓐ Ventral Central Nervous System – Leech

Ⓑ Ventral heart – Scorpion

Ⓒ Post and tail – Octopus

Ⓓ Pharyngeal gill slits absent in embryo – Chameleon

171. Commercial cork is obtained from:

Ⓐ *Berberis* Ⓑ *Salix* Ⓒ *Quercus* Ⓓ *Betual*

172. Fruit of *Mangifera indica* is

Ⓐ Berry Ⓑ Drupe Ⓒ Capsule Ⓓ Siliqua

173. Vivipary is a characteristic of:

Ⓐ Mesophytes Ⓑ Xerophytes Ⓒ Halophytes Ⓓ Hydrophytes

174. In groundnut, the food/oil reserve is present in:

Ⓐ Epicarp Ⓑ Mesocarp Ⓒ Endocarp Ⓓ Cotyledons

175. Death of protoplasm is a prerequisite for:

Ⓐ Transport of food Ⓑ Transport of sap Ⓒ Absorption of water Ⓓ Gaseous exchange

176. Pith and cortex do not differentiate in:

Ⓐ Monocot stem Ⓑ Dicot stem Ⓒ Monocot root Ⓓ Dicot root

177. Cork is formed from:

Ⓐ Cork cambium (Phellogen) Ⓑ Vascular cambium

Ⓒ Phloem Ⓓ Xylem

178. Which meristem helps in increasing girth?

Ⓐ Apical meristem Ⓑ Lateral meristem Ⓒ Intercalary meristem Ⓓ Primary meristem

179. In frog, the surface of attachment of tongue is:

Ⓐ Pterygoid Ⓑ Hyoid apparatus Ⓒ Parasphenoid Ⓓ Palatine

180. The Kidney of an adult frog is:

Ⓐ Metanephros Ⓑ Opisthonephros Ⓒ Pronephros Ⓓ Mesonephros