

# VERY SIMILAR QUESTION PAPER-1 (NEET 2026)

[Time : 3 Hrs.]

Full Marks : 720

## PHYSICS

01. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 8 mm and zero of circular scale division coincides with 35 divisions above the reference level. If screw gauge has a zero error of -0.003 cm, the correct diameter of the ball is :

(1) 0.832 cm (2) 0.838 cm  
(3) 0.829 cm (4) 0.841 cm

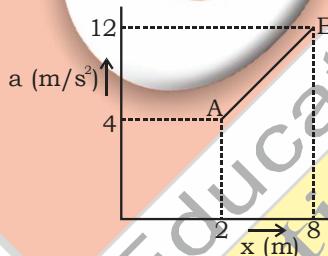
02. If torque ( $\tau$ ), impulse (I) and time (T) are chosen as fundamental quantities, then dimensional formula of gravitational constant (G) will be :

(1)  $[\tau^3 I^{-2} T^{5/2}]$  (2)  $[\tau^6 I^{-3} T^{-2}]$   
(3)  $[\tau^5 I^{-4} I^{1/2}]$  (4)  $[\tau^4 I^{-5} T]$

03. A particle moving along x-axis has acceleration  $f$ , at time  $t$ , given by  $f = f_0 \left(1 - \frac{t}{4T}\right)$ , where  $f_0$  and  $T$  are constants. The particle at  $t = 0$  has a zero velocity. In the time interval between  $t = 0$  and the instant when  $f = 0$ , the particle's velocity ( $v_x$ ) is :

(1)  $2f_0T$  (2)  $4f_0T$  (3)  $\frac{1}{8}f_0T$  (4)  $\frac{1}{16}f_0T$

04. If acceleration of a particle is varying with  $x$  according to straight line, AB. Velocity of particle at A is 2 m/s. What is the velocity of particle at point B ?



(1) 16 m/s (2) 14 m/s (3) 12 m/s (4) 10 m/s

05. A cart is moving horizontally along a straight line with constant speed 40 m/s. A projectile is to be fired from the moving cart in such a way that it will return to the cart after the cart has moved 160m. At what speed (relative to the cart) must the projectile be fired ? (Take  $g = 10 \text{ m/s}^2$ )

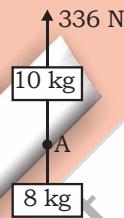
(1) 15 m/s (2) 30 m/s (3) 20 m/s (4) 10 m/s

06. A ball is projected upwards from the top of tower with a velocity  $80 \text{ ms}^{-1}$  making an angle  $30^\circ$  with the horizontal. The height of tower is 100m. After how many seconds from the instant of throwing

will the ball reach the ground ? ( $g = 10 \text{ m/s}^2$ )

(1) 12 sec. (2) 15 sec. (3) 10 sec. (4) 18 sec.

07. Two blocks of masses 10 kg and 8 kg are connected by a rope of mass 6 kg. The system is pulled up with a force of 336 N as shown in figure. The tension in the rope at its midpoint A is : ( $g = 10 \text{ m/s}^2$ )



(1) 172 N (2) 196 N (3) 141 N (4) 154 N

08. The upper one-fourth of an inclined plane of inclination  $\theta$  is perfectly smooth while lower three-fourth of rough. A block starting from rest at the top of the plane will again come to rest at the bottom, if the coefficient of friction between the block and lower three-fourth portion of the plane is given by :

(1)  $\mu = \frac{3}{4} \tan \theta$  (2)  $\mu = \frac{5}{4} \tan \theta$   
(3)  $\mu = \frac{4}{3} \tan \theta$  (4)  $\mu = \frac{4}{5} \tan \theta$

09. A block of mass 6 kg is on a rough horizontal surface and is at rest. Now a force of 36 N imparted to it with negligible impulse. If the coefficient of kinetic friction is 0.4 and  $g = 10 \text{ m/s}^2$ , then the acceleration of the block is :

(1)  $1.5 \text{ m/s}^2$  (2)  $2 \text{ m/s}^2$   
(3)  $1 \text{ m/s}^2$  (4)  $4 \text{ m/s}^2$

10. **Assertion :** Two springs of force constants  $k_1$  and  $k_2$  are stretched by the same force. If  $k_1 > k_2$ , then work done in stretching the first ( $W_1$ ) is greater than work done in stretching the second ( $W_2$ ).

**Reason :**  $k_1 > k_2 \Rightarrow W_1 > W_2$

(1) Both **Assertion** and **Reason** are correct and **Reason** is the correct explanation of **Assertion**.  
(2) Both **Assertion** and **Reason** are correct but **Reason** is not correct explanation of **Assertion**.  
(3) **Assertion** is correct but **Reason** is incorrect.  
(4) Both **Assertion** and **Reason** are incorrect.

11. An engine pumps water continuously through a hose. Water leaves the hose with a velocity  $2v$  and  $m$  is the mass per unit length of the water jet. What is the rate at which kinetic energy is imparted to water?

(1)  $8mv^3$  (2)  $16mv^3$  (3)  $2mv^3$  (4)  $4mv^3$

12. A block of mass 12 kg is moving in x-direction with a constant speed  $20\text{ ms}^{-1}$ . It is subjected to a retarding force  $F = 0.4 \times J/\text{m}$  during its travel from  $x = 30\text{m}$  to  $x = 40\text{m}$ . Find the final K.E.

(1) 2260 J (2) 2340 J (3) 2080 J (4) 2170 J

13. On a frictionless surface, a block of mass  $M$  moving at speed  $v$  collides elastically with another block of same mass  $M$  which is initially at rest. After collision the first block moves at an angle  $\theta$  to its initial direction and has a speed  $\frac{v}{4}$ . The second block's speed after the collision is :

(1)  $\frac{\sqrt{15}}{4}v$  (2)  $\frac{\sqrt{3}}{2}v$  (3)  $\frac{\sqrt{13}}{4}v$  (4)  $\frac{3}{4\sqrt{2}}v$

14. A particle suspended by a light inextensible thread of length  $l$  is projected horizontally from

its lowest position with velocity  $\sqrt{\frac{22gl}{5}}$ . The string will slack after swinging through an angle equal to :

(1)  $143^\circ$  (2)  $127^\circ$  (3)  $120^\circ$  (4)  $135^\circ$

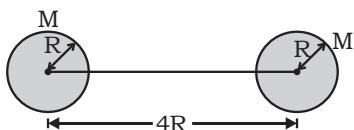
15. A motor cycle is going on an overbridge of radius  $R$ . The driver maintains a constant speed. As the motorcycle is ascending on the overbridge, the normal force on it.

(1) remains constant (2) decreases  
(3) increases (4) None of these

16. A man weighing 60 kg is standing in a trolley weighing 340 kg. The trolley is resting on frictionless horizontal rails. If the man starts walking on the trolley with a speed of 3 m/s, then after 5 sec its displacement relative to the ground will be :

(1) 14.25 m (2) 13.75 m (3) 12.75 m (4) 12.25 m

17. Two spheres each of mass  $M$  and radius  $R$  are connected with a massless rod of length  $4R$  as shown in the figure. What will be the moment of inertia of the system about an axis passing through the centre of one of the spheres and perpendicular to the rod?



(1)  $\frac{82}{5}MR^2$  (2)  $\frac{84}{5}MR^2$

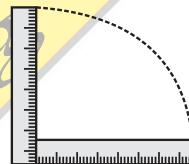
(3)  $\frac{78}{5}MR^2$  (4)  $\frac{72}{5}MR^2$

18. **Statement I :** When a solid sphere is placed in the fluid under high pressure, then it is compressed uniformly on all sides.

**Statement II :** The force applied by fluids acts in perpendicular direction at each point of surface of the sphere.

(1) Both **Statement-I** and **Statement-II** are incorrect.  
(2) Both **Statement-I** and **Statement-II** are correct.  
(3) **Statement-I** is correct but **Statement-II** is incorrect.  
(4) **Statement-I** is incorrect but **Statement-II** is correct.

19. A stick of length, 2m is held vertically with one end on the floor and is then allowed to fall. If the end touch with the floor is not allowed to slip, the middle point of the stick will hit the ground with a velocity of ( $g = 10\text{ m/s}^2$ ) :



(1) 3.87 m/s (2) 5.8 m/s  
(3) 7.7 m/s (4) 2.18 m/s

20. Satellites orbiting the earth have finite life and sometimes debris of satellites fall to the earth. This is because :

(1) of collisions with other satellites  
(2) of viscous forces causing the speed of satellite and hence height of satellites gradually decrease  
(3) the laws of gravitation predict a trajectory spiralling inwards  
(4) the solar cells and batteries in satellites run out

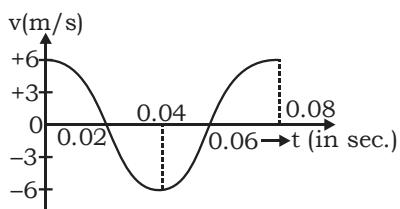
21. The radius of a planet is  $R$ . A satellite revolves around it in a circle of radius  $2R$  with angular velocity  $\omega_0$ . The acceleration due to the gravity on planet's surface is :

(1)  $4\omega_0^2 R$  (2)  $2\omega_0^2 R$  (3)  $16\omega_0^2 R$  (4)  $8\omega_0^2 R$

22. In He gas process,  $PV^2 = \text{constant}$ . The ratio of work done by gas to change in internal energy is:

(1) -0.67 (2) 0.4 (3) -0.33 (4) 0.5

23. The velocity-time diagram of a harmonic oscillator is shown in the adjoining figure. The frequency of oscillation is :



(1) 50 Hz (2) 25 Hz (3) 12.5 Hz (4) 6.25 Hz  
 24. The 3rd overtone of a closed organ pipe is equal to the 4th harmonic of an open organ pipe. Then the ratio of their lengths is equal to :

(1)  $\frac{7}{4}$  (2)  $\frac{7}{8}$  (3)  $\frac{5}{4}$  (4)  $\frac{5}{8}$

25. Match the following columns.

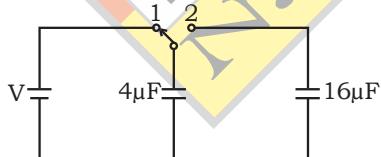
**Column I**

A. First law of thermodynamics  
 B.  $\Delta U$   
 C. Isothermal process  
 D.  $\Delta Q$

(1) (A-IV), (B-I), (C-III), (D-II)  
 (2) (A-IV), (B-III), (C-I), (D-II)  
 (3) (A-III), (B-I), (C-IV), (D-II)  
 (4) (A-IV), (B-III), (C-II), (D-I)

26. An electric charge  $2 \times 10^{-3} \mu\text{C}$  is placed at the origin (0, 0) of X-Y co-ordinate system. Two points A and B are situated at  $(\sqrt{3} \text{ m}, \sqrt{6} \text{ m})$  and  $(3\text{m}, 0)$  respectively. The potential difference between the points A and B will be :  
 (1) 6 volt (2) 12 volt (3) zero (4) 3 volt

27. A capacitor of  $4 \mu\text{F}$  is charged as shown in the diagram. When the switch S is turned to position 2, the percentage of its stored energy dissipated is :



(1) 80% (2) 90% (3) 75% (4) 60%

28. The net resistance of an ammeter should be small to ensure that :

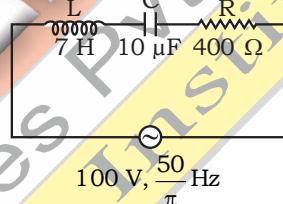
(1) it can measure large currents  
 (2) it does not get overheated

(3) it does not appreciably change the current to be measured.  
 (4) it does not draw excessive current

29. The drift velocity of the electrons in a copper wire of length 3 m under the application of a potential difference of 300 V is  $6 \times 10^{-2} \text{ ms}^{-1}$ . Their mobility is (in  $\text{m}^2 \text{ V}^{-1} \text{ s}^{-1}$ )  
 (1)  $2 \times 10^{-2}$  (2)  $6 \times 10^{-4}$  (3)  $3 \times 10^{-4}$  (4)  $1.5 \times 10^{-3}$

30. A proton of mass  $m$  and charge  $q$  is moving in a plane with kinetic energy  $2E$ . If there exists a uniform magnetic field  $B$ , perpendicular to the plane of the motion, the proton will move in a circular path of radius :  
 (1)  $\frac{\sqrt{2mE}}{qB}$  (2)  $\frac{\sqrt{8mE}}{qB}$  (3)  $\frac{4\sqrt{mE}}{qB}$  (4)  $\frac{2\sqrt{mE}}{qB}$

31. In the series LCR circuit shown, the impedance is :



(1)  $707 \Omega$  (2)  $617 \Omega$  (3)  $500 \Omega$  (4)  $800 \Omega$

32. A ray of light suffers a minimum deviation when incident on an equilateral prism of refractive index  $\sqrt{3}$ . The angle of incidence is:

(1)  $60^\circ$  (2)  $45^\circ$  (3)  $30^\circ$  (4)  $53^\circ$

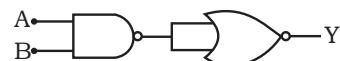
33. In a Young's double slit experiment, the intensity of light at a point on the screen where path difference is  $\lambda$ , is  $I$ . What will be the intensity at the point where path difference is  $\lambda/3$ ?

(1)  $\frac{3}{4}I$  (2)  $\frac{3}{8}I$  (3)  $\frac{1}{2}I$  (4)  $\frac{1}{4}I$

34. What is the wavelength of the most energetic photon emitted in the Lyman series of the hydrogen atom?

(1)  $1215 \text{ \AA}$  (2)  $911 \text{ \AA}$  (3)  $1125 \text{ \AA}$  (4)  $1025 \text{ \AA}$

35. The logic operation carried out by the circuit below is that of :



(1) OR gate (2) NOR gate  
 (3) AND gate (4) NAND gate

36. A 0.2 m long conductor carrying a current of 60 A is held perpendicular to a magnetic field of 0.5 T. The mechanical power required to move the conductor with a speed of  $3 \text{ ms}^{-1}$  is :  
 (1) 18 W (2) 9 W (3) 4.5 W (4) 2.25 W

37. The magnitude of saturation photoelectric current depends upon :

(1) stopping potential (2) work function  
(3) intensity (4) frequency

38. The barrier potential of a p-n junction depends on:

A. type of semiconductor material  
B. amount of doping  
C. temperature

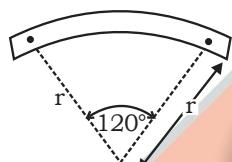
Which one of the following is correct ?

(1) B only (2) B and C only  
(3) A and B only (4) A, B and C

39. The image of an object in concave lens is formed at  $f/4$ , where  $f$  is the focal length of the lens. Find the distance of the object from the lens

(1)  $\frac{f}{5}$  (2)  $\frac{f}{3}$  (3)  $\frac{2f}{3}$  (4)  $\frac{f}{2}$

40. A bar magnet of length ' $l$ ' and magnetic dipole moment ' $M$ ' is bent in the form of an arc as shown in figure. The new magnetic dipole moment will be:

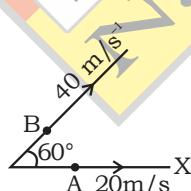


(1)  $\frac{3\sqrt{3} M}{\pi}$  (2)  $\frac{3\sqrt{3} M}{4\pi}$  (3)  $\frac{\sqrt{3} M}{\pi}$  (4)  $\frac{3\sqrt{3} M}{2\pi}$

41. The electric and the magnetic fields, associated with an e.m. wave, propagating along the  $+y$ -axis, can be represented by :

(1)  $[\vec{E} = E_0 \hat{k}, \vec{B} = B_0 \hat{i}]$  (2)  $[\vec{E} = E_0 \hat{i}, \vec{B} = B_0 \hat{k}]$   
(3)  $[\vec{E} = E_0 \hat{j}, \vec{B} = B_0 \hat{i}]$  (4)  $[\vec{E} = E_0 \hat{i}, \vec{B} = B_0 \hat{j}]$

42. Particle A moves along X-axis with a uniform velocity of magnitude 20 m/s. Particle B moves with uniform velocity 40 m/s along a direction making an angle of  $60^\circ$  with the positive direction of X-axis as shown in the figure. The relative velocity of B with respect to that of A is:



(1)  $20\sqrt{3}$  m/s along y-axis (perpendicular to x-axis).  
(2)  $20\sqrt{7}$  m/s along the bisector of velocities of A and B.

(3)  $20\sqrt{3}$  m/s along the direction,  $120^\circ$  with  $+x$ -axis.

(4)  $20\sqrt{5}$  m/s along the direction,  $135^\circ$  with  $+x$ -axis.

43. A body of mass 4 kg starts from the origin with an initial velocity  $\vec{u} = (40 \hat{i} + 60 \hat{j}) \text{ ms}^{-1}$ . If a constant force  $(-5 \hat{i} - 8 \hat{j}) \text{ N}$  acts on the body, the time in which the y component of the velocity becomes zero, is :

(1) 32 sec. (2) 20 sec. (3) 30 sec. (4) 24 sec.

44. A particle moves in a circular path with decreasing speed. Choose the correct statement.

(1) Acceleration  $\vec{a}$  is towards the centre.  
(2) The direction of angular momentum remains constant.  
(3) Angular momentum remains constant.  
(4) Particle moves in a spiral path with decreasing radius.

45. A solid cylinder of mass  $m$  rolls down an inclined plane without slipping, starting from rest at the top of an inclined plane. The linear speed of the cylinder at the bottom of the inclined plane is  $v$ . The kinetic energy of the cylinder at the bottom is:

(1)  $\frac{3}{4}mv^2$  (2)  $\frac{3}{8}mv^2$  (3)  $\frac{5}{8}mv^2$  (4)  $\frac{5}{4}mv^2$

## CHEMISTRY

46. In a sample of atomic hydrogen electrons are in  $4^{\text{th}}$  excited state. In the spectrum of emitted radiation, number of lines in the Lyman series and Balmer series are respectively :

(1) 2, 1 (2) 2, 3 (3) 1, 2 (4) 4, 3

47. An ideal solution has two components A and B. A is more volatile than B i.e.  $P_A^{\text{o}} > P_B^{\text{o}}$  and also  $P_A^{\text{o}} > P_{\text{total}}$ . If  $X_A$  and  $Y_A$  are mole fractions of components A in liquid and vapour phases, then

(1)  $X_A = Y_A$  (2)  $X_A > Y_A$   
(3)  $X_A < Y_A$  (4) data insufficient

48. In a multielectron atom, which of the following orbitals described by three quantum numbers will have same energy in the absence of magnetic and electric field.

(A)  $n = 1, l = 0, m = 0$  (B)  $n = 2, l = 0, m = 0$   
(C)  $n = 2, l = 1, m = 1$  (D)  $n = 3, l = 2, m = 1$   
(E)  $n = 3, l = 2, m = 0$

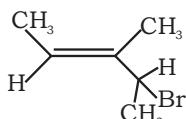
(1) A and B (2) B and C (3) C and D (4) D and E

49. **Assertion (A)** : Among all the hydrides of Group-15 elements  $\text{BiH}_3$  is strongest oxidising agent.

**Reason (R)** : The size of Bi is largest, that's why Bi—H bond dissociates more easily than other hydrides of Group-15 elements.

- Both (A) and (R) are true and (R) is the correct explanation of (A).
- Both (A) and (R) are true and (R) is not the correct explanation of (A).
- (A) is true but (R) is false.
- (A) is false but (R) is true.

50. What is the IUPAC name of the following compound?



- 4-Bromo-3-methylpent-2-ene
- 2-Bromo-3-methylpent-3-ene
- 3-Bromo-1,2-dimethylbut-1-ene
- 1-Bromo-1,3-dimethylbut-1-ene

51. The pair of electrons in the given carbanion  $\text{CH}_3 - \text{C}^{\ominus}$ , is present in which of the following orbitals?

- $\text{sp}^3$
- $\text{sp}^2$
- $\text{sp}$
- $2\text{p}$

52. **List-I (Basic Radical)      List-II (Group)**

A. $\text{Fe}^{3+}$	I. II group
B. $\text{Ni}^{2+}$	II. V group
C. $\text{Ca}^{2+}$	III. IV group
D. $\text{Cu}^{2+}$	IV. III group
(1) (A-IV), (B-II), (C-I), (D-III)	
(2) (A-II), (B-IV), (C-I), (D-III)	
(3) (A-III), (B-I), (C-II), (D-IV)	
(4) (A-IV), (B-III), (C-II), (D-I)	

53. The number of  $\pi$ -bonds and  $\sigma$ -bonds respectively in the following structure is :



- 6, 19
- 4, 20
- 5, 19
- 5, 20

54. Among the following oxides of p-block elements, the number of oxides having amphoteric nature is :



- 5
- 4
- 3
- 2

55. The correct statement about  $\text{BrF}_5$  and  $\text{PCl}_5$  is :

- both are isostructural.

- $\text{BrF}_5$  is square pyramidal and  $\text{PCl}_5$  is trigonal bipyramidal.
- $\text{PCl}_5$  is square planar and  $\text{BrF}_5$  is see saw.
- $\text{BrF}_5$  is  $\text{sp}^3\text{d}$  hybridised and  $\text{PCl}_5$  is  $\text{sp}^3\text{d}$  hybridised.

56. A concentrated solution of  $\text{NaCl}$  containing a small amount of  $\text{HPh}$  is electrolysed using Pt-electrodes. The colour of the solution after some time will :

- Remain colourless
- Changes from colourless to pink
- Changes from pink to colourless
- Remain pink

57. In which of the following complex ion the value of magnetic moment (spin only) is  $\sqrt{3}$  B.M and outer d-orbital is used in hybridisation?

- $[\text{Fe}(\text{NH}_3)_6]^{3+}$
- $[\text{Mn}(\text{CN})_6]^{4-}$
- $[\text{CuCl}_6]^{4-}$
- $[\text{Co}(\text{NH}_3)_6]^{2+}$

58. The shifting of electrons of multiple bonds under the influence of a reagent is called :

- Inductive effect
- Electromeric effect
- Mesomeric effect
- Hyperconjugation

59. For the reaction :



$\Delta H_r$  at  $27^\circ\text{C}$  is  $-25$  kcal. The value of  $\Delta E_r$  is :

- 23.2 kcal
- 25 kcal
- 23.8 kcal
- 27.5 kcal

60. The electronic configuration of  $\text{Cf}(Z = 98)$ ,  $\text{Np}(Z = 93)$  and  $\text{Tb}(Z = 65)$ , respectively are :

- $[\text{Rn}]5\text{f}^{10}7\text{s}^2$ ,  $[\text{Rn}]5\text{f}^4 6\text{d}^1 7\text{s}^2$ ,  $[\text{Xe}]4\text{f}^9 6\text{s}^2$
- $[\text{Rn}]4\text{f}^7 6\text{s}^2$ ,  $[\text{Rn}]5\text{f}^3 6\text{d}^2 7\text{s}^2$ ,  $[\text{Xe}]4\text{f}^{10} 6\text{s}^1$
- $[\text{Rn}]5\text{f}^4 6\text{d}^1 7\text{s}^2$ ,  $[\text{Rn}]4\text{f}^9 6\text{s}^2$ ,  $[\text{Xe}]4\text{f}^8 6\text{s}^2 7\text{p}^1$
- $[\text{Rn}]5\text{f}^9 7\text{s}^2$ ,  $[\text{Rn}]5\text{f}^5 7\text{s}^2$ ,  $[\text{Xe}]4\text{f}^8 6\text{s}^2 7\text{p}^1$

61. **Assertion (A)** : n-Butane and iso-butane are examples of structural isomers.

**Reason (R)** : Structural isomers have the same molecular formula but different connectivity of atoms.

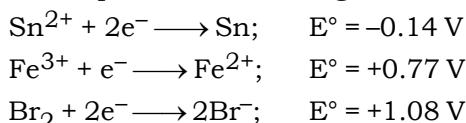
- Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

- Both Assertion and Reason are correct but Reason is not correct explanation of Assertion.

- Assertion is correct, but Reason is incorrect.

- Assertion is incorrect, but Reason is correct.

62. Electrode potential data are given below :



Based on the given data, reducing power of Sn,  $\text{Fe}^{2+}$  and  $\text{Br}^-$  will increase in the order.

(1)  $\text{Sn} < \text{Fe}^{2+} < \text{Br}^-$  (2)  $\text{Sn} < \text{Br}^- < \text{Fe}^{2+}$   
 (3)  $\text{Br}^- < \text{Fe}^{2+} < \text{Sn}$  (4)  $\text{Br}^- < \text{Sn} < \text{Fe}^{2+}$

63. When acidic  $\text{KMnO}_4$  is treated with potassium iodide, iodide ion is converted into 'Y'. Then 'Y' is :

(1)  $\text{IO}^-$  (2) iodine (3) iodate (4)  $\text{IO}_4^-$

64. A very dilute solution of sodium chloride is electrolysed using inert electrodes. The products at the cathode and anode are respectively :

(1)  $\text{H}_2, \text{O}_2$  (2)  $\text{Na}, \text{O}_2$  (3)  $\text{H}_2, \text{SO}_2$  (4)  $\text{Na}, \text{SO}_2$

65. A substance X, undergoes a first order reaction  $\text{X} \longrightarrow \text{Y}$  with a half life of 15 min. If the initial concentration of X is 4M, what will its concentration be after 60 min ?

(1) 0.125 M (2) 0.25 M (3) 0.5 M (4) 1 M

66. The complex diamminechloridonitrito-N-platinum (II) can be represented as :

(1)  $[\text{Pt}(\text{NH}_3)_2\text{Cl}(\text{NO}_2)]$  (2)  $[\text{Pt}(\text{NH}_2-\text{NH}_2)_2\text{Cl}(\text{NO}_2)]$   
 (3)  $[\text{Pt}(\text{en})_2\text{Cl}(\text{NO})]$  (4)  $[\text{Pt}(\text{NH}_3)_2(\text{Cl}_2)(\text{NO}_2)]$

67. The density of group-13 elements.

(1) increases down the group from B to Ga then decreases upto Tl.  
 (2) increases down the group from B to Tl.  
 (3) decreases down the group from B to Tl.  
 (4) decreases down the group from B to Ga and then increases up to Tl.

68. Match List-I with List-II.

<b>List I</b>	<b>List II</b>
<b>(Reaction)</b>	<b>(Reagents)</b>
A. Etard reaction	I. $\text{CO}, \text{HCl}/\text{AlCl}_3$
B. Gatterman-Koch	II. $\text{SnCl}_2 + \text{HCl}/\text{H}_3\text{O}^\oplus$ reaction
C. Stephen reaction	III. $\text{Zn}-\text{Hg}/\text{HCl}$
D. Clemmensen	IV. $\text{CrO}_2\text{Cl}_2, \text{CS}_2/\text{H}_3\text{O}^\oplus$ reaction

Choose the correct answer from the options given below.

(1) (A-II), (B-III), (C-IV), (D-I)  
 (2) (A-IV), (B-I), (C-II), (D-III)  
 (3) (A-III), (B-I), (C-II), (D-IV)  
 (4) (A-IV), (B-II), (C-I), (D-III)

69. Match the column I with column II

<b>Column - I</b>	<b>Column - II</b>
(Reactions)	(Reagents)

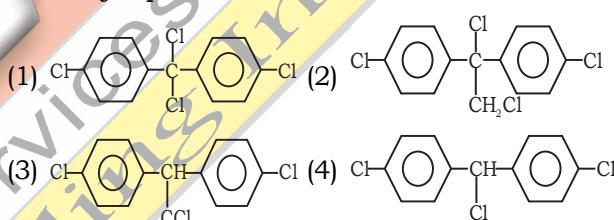
(A)  $\text{CH}_3(\text{CH}_2)_5 - \text{C} = \text{O} - \text{OC}_2\text{H}_5 \rightarrow \text{CH}_3(\text{CH}_2)_5\text{CHO}$  (i)  $\text{CH}_3\text{MgBr}, \text{H}_2\text{O}$   
 (B)  $\text{PhCOPh} \rightarrow \text{PhCH}_2\text{Ph}$  (ii)  $\text{Zn}(\text{Hg}), \text{Conc. HCl}$   
 (C)  $\text{PhCHO} \rightarrow \text{PhCH}(\text{OH})\text{CH}_3$  (iii)  $\text{NaBH}_4, \text{H}^\oplus \rightarrow \text{PhCH}(\text{OH})\text{CH}_3$   
 (D)  $\text{CH}_3\text{COCH}_2\text{COOC}_2\text{H}_5 \rightarrow \text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{COOC}_2\text{H}_5$  (iv)  $\text{DiBAL} - \text{H}, \text{H}_2\text{O}$

(1) (A)  $\rightarrow$  (iii), (B)  $\rightarrow$  (iv), (C)  $\rightarrow$  (ii), (D)  $\rightarrow$  (i)  
 (2) (A)  $\rightarrow$  (iv), (B)  $\rightarrow$  (ii), (C)  $\rightarrow$  (i), (D)  $\rightarrow$  (iii)  
 (3) (A)  $\rightarrow$  (iii), (B)  $\rightarrow$  (iv), (C)  $\rightarrow$  (i), (D)  $\rightarrow$  (ii)  
 (4) (A)  $\rightarrow$  (iv), (B)  $\rightarrow$  (ii), (C)  $\rightarrow$  (iii), (D)  $\rightarrow$  (i)

70. Chlorobenzene reacts with trichloroacetaldehyde in the presence of  $\text{H}_2\text{SO}_4$ .



The major product formed is :



71. 1 mole each of  $\text{CO(g)}$ ,  $\text{H}_2\text{O(g)}$ ,  $\text{H}_2\text{g}$  and  $\text{CO}_2\text{g}$  are placed in one litre flask at  $25^\circ\text{C}$ . When following equilibrium is set-up



then  $\text{CO}_2$  present at equilibrium is :

(1) 0.5 mol (2) 1.5 mol (3) 0.25 mol (4) 3.0 mol

72. 25 ml of the given HCl solution requires 30 ml of 0.1 M sodium carbonate solution. What is the volume of this HCl solution required to titrate 30ml of 0.2 M aqueous NaOH solution.

(1) 50 ml (2) 75 ml (3) 12.5 ml (4) 25 ml

73. Match List-I with List-II.

<b>List-I</b>	<b>List-II</b>
(Name of amines)	(Pkb value in aqueous phase)
A. Ethanamine	I. 3.27
B. N-Ethylethanamine	II. 3.29
C. N-Methylmethanamine	III. 3.38
D. Methanamine	IV. 3.00

Choose the correct answer from the options given below.

(1) (A-II), (B-IV), (C-I), (D-III)  
 (2) (A-II), (B-IV), (C-III), (D-I)  
 (3) (A-III), (B-II), (C-I), (D-IV)  
 (4) (A-IV), (B-I), (C-II), (D-III)

74. The element do not show variable oxidation state is :  
 (1) Bromine (2) Chlorine  
 (3) Iodine (4) Fluorine

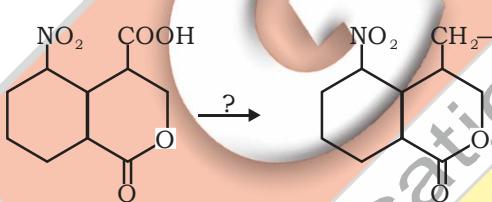
75. Which one of the following is a water soluble vitamin that is not excreted easily ?  
 (1) Vitamin-B<sub>2</sub> (2) Vitamin-B<sub>1</sub>  
 (3) Vitamin-B<sub>6</sub> (4) Vitamin-B<sub>12</sub>

76. Incorrect method of preparation of alcohols from the following is :  
 (1) Reaction of aldehyde with CH<sub>3</sub>MgBr followed by hydrolysis.  
 (2) Reaction of primary alkyl halide with aqueous NaOH.  
 (3) Ozonolysis of alkene.  
 (4) Hydroboration-oxidation of propene.

77. In which of the following processes entropy increases ?  
 A. A liquid evaporates to vapour.  
 B. Temperature of a crystalline solid lowered from 130 K to 0 K.  
 C. 2NaHCO<sub>3(s)</sub> → Na<sub>2</sub>CO<sub>3(s)</sub> + CO<sub>2(g)</sub> + H<sub>2</sub>O<sub>(g)</sub>  
 D. Cl<sub>2(g)</sub> → 2Cl<sub>(g)</sub>

Choose the correct answer from the options given below :  
 (1) A and C (2) A, B and D  
 (3) A, C and D (4) C and D

78. The most suitable reagent for the given conversion is :



(1) B<sub>2</sub>H<sub>6</sub> (2) LiAlH<sub>4</sub> (3) NaBH<sub>4</sub> (4) H<sub>2</sub>/Pd

79. **Assertion (A) :** Half filled and fully filled degenerate set of orbitals acquire extra stability.  
**Reason (R) :** Half filled and fully filled degenerate set of orbitals have symmetrical distribution of electrons and high exchange energy.  
 (1) Both (A) and (R) are true but (R) is not the correct explanation of (A).  
 (2) Both (A) and (R) are true and (R) is the correct explanation of (A).  
 (3) (A) is true but (R) is false.  
 (4) (A) is false but (R) is true.

80. The rate constant for a first order decomposition

reaction is given by  $\log K = 10 - \frac{1000}{T}$ . Then, what will be activation energy in kcal/mol ?  
 (1) 4.60 (2) 17.6 (3) 3.2 (4) 9.8

81. **Assertion (A) :** The freezing point of a solution having non volatile solute is lower than the freezing point of the pure solvent.  
**Reason (R) :** The presence of solute particles disrupts the formation of the solvent's solid structure, lowering the freezing point.  
 (1) Both **Assertion** and **Reason** are correct and **Reason** is the correct explanation of **Assertion**.  
 (2) Both **Assertion** and **Reason** are correct but **Reason** is not the correct explanation of **Assertion**.  
 (3) **Assertion** is correct, but **Reason** is incorrect.  
 (4) **Assertion** is incorrect, but **Reason** is correct.

82. What happens when a mixture of acetylene and hydrogen is passed over heated Lindlar's catalyst ?  
 (1) Ethylene and water are formed  
 (2) Ethane and water are formed  
 (3) Ethylene is formed  
 (4) Acetylene and ethane are formed

83. Which of the following test(s) can be used to distinguish propanal and propanone ?  
 A. Iodoform test B. Hinsberg test  
 C. Carbylamine test D. Fehling's test  
 E. Tollen's test F. Lucas test  
 (1) A, D and E only (2) A, B, C and F only  
 (3) B, C, F only (4) B, C, D and E only

84. NH<sub>3(g)</sub> + H<sub>2</sub>O → NH<sub>3(aq)</sub>; ΔH = -8.4 kcal  
 HCl<sub>(g)</sub> + H<sub>2</sub>O → HCl<sub>(aq)</sub>; ΔH = -17.3 kcal  
 NH<sub>3(aq)</sub> + HCl<sub>(aq)</sub> → NH<sub>4</sub>Cl<sub>(aq)</sub>; ΔH = -12.5 kcal  
 NH<sub>4</sub>Cl<sub>(s)</sub> + H<sub>2</sub>O → NH<sub>4</sub>Cl<sub>(aq)</sub>; ΔH = +3.9 kcal

Find the heat change (ΔH) in the reaction for  
 NH<sub>3(g)</sub> + HCl<sub>(g)</sub> → NH<sub>4</sub>Cl<sub>(s)</sub>  
 (1) -42.1 kcal (2) -34.3 kcal  
 (3) +34.3 kcal (4) +42.1 kcal

85. **Statement-I :** In partition chromatography a thin film of liquid acts as stationary phase.  
**Statement-II :** Paper chromatography is not a type of partition chromatography.  
 (1) Both **Statement I** and **Statement II** are correct.  
 (2) Both **Statement I** and **Statement II** are incorrect.  
 (3) **Statement-I** is correct, but **Statement-II** is incorrect.  
 (4) **Statement-II** is correct, but **Statement-I** is incorrect.

86. The vapour pressure of pure liquids M and N are 400 torr and 700 torr respectively at 350 K. Find out the composition of the liquid mixture if total vapour pressure is 600 torr.

(1)  $X_M = \frac{1}{2}$ ,  $X_N = \frac{1}{2}$       (2)  $X_M = \frac{1}{3}$ ,  $X_N = \frac{2}{3}$

(3)  $X_M = \frac{3}{4}$ ,  $X_N = \frac{1}{4}$       (4)  $X_M = \frac{1}{6}$ ,  $X_N = \frac{5}{6}$

87. The correct order of melting points of hydrides of group-16 element is :

(1)  $H_2O > H_2Te > H_2Se > H_2S$   
 (2)  $H_2Te > H_2Se > H_2S > H_2O$   
 (3)  $H_2O > H_2Se > H_2Te > H_2S$   
 (4)  $H_2O > H_2Te > H_2S > H_2Se$

88. Match the complex species given in Column-I with the possible isomerism given in Column-II. Assign the correct code.

**Column I**

A.  $[Co(NH_3)_4Cl_2]^+$   
 B.  $cis-[PtCl_2(en)_2]^{2+}$   
 C.  $[Co(NH_3)_5(SO_4)]Br$   
 D.  $[Co(NH_3)_6][Cr(CN)_6]$   
 (1) (A-I), (B-II), (C-III), (D-IV)  
 (2) (A-IV), (B-III), (C-II), (D-I)  
 (3) (A-I), (B-IV), (C-III), (D-II)  
 (4) (A-IV), (B-I), (C-II), (D-III)

**Column II**

I. Optical  
 II. Ionisation  
 III. Coordination  
 IV. Geometrical

89. The reaction of propene with HBr in the presence of ROOR (Peroxide) proceeds through which of the following most stable intermediate?

(1)  $CH_3 - \overset{\cdot}{C}H - CH_3$       (2)  $CH_3 - \overset{\cdot}{C}H - CH_2Br$   
 (3)  $CH_3 - \overset{Br}{C}H - \overset{\cdot}{C}H_2$       (4)  $CH_3 - CH_2 - \overset{\cdot}{C}H_2$

90. Which of the following statements is incorrect about resonance?

(1) All the resonance structure must have all their atoms in the same relative positions in space but differ only in the placement of electrons.  
 (2) All the resonance structure must have the same number of paired or unpaired electrons.  
 (3) The atoms participating in the delocalisation of Pi-electrons must lie in the same plane.  
 (4) The resonance hybrid has a higher energy than any of the resonance contributors.

**BIOLOGY**

91. Consider the given two statements:

**Statement I:** Ethylene promotes rapid

internode/petiole, elongation in deep water rice plants.

**Statement II :** In buttercup, shapes of leaves produced in air and those produced in water are different.

(1) Both **Statement I** and **II** are true.  
 (2) Both **Statement I** and **II** are false.  
 (3) Only **Statement I** is true.  
 (4) Only **Statement II** is true.

92. (i) in (ii) confirmed the release of a volatile substance from ripened oranges that hastened the ripening of stored unripened bananas. Later this volatile substance was identified as (iii). Identify (i), (ii) and (iii)

<b>(i)</b>	<b>(ii)</b>	<b>(iii)</b>
(1) F.Skoog	(1960)	Ethylene
(2) E.Kurosawa	(1910)	Cytokinin
(3) F.W.went	(1955)	Auxin
(4) H.H.cousins	(1910)	Ethylene

93. Which protein complex in the electron transport chain is responsible for reducing molecular oxygen ( $O_2$ )?

(1) Complex -IV (Cytochrome 'C' oxidase)  
 (2) Complex-III (Ubiquinone -Cytochrome 'C' oxidoreductase)  
 (3) Complex -II (Succinate -Ubiquinone reductase)  
 (4) Complex -I (NADH<sub>2</sub>-Ubiquinone reductase)

94. Which Statement is wrong for Kreb's cycle?

(1) There is one point in the cycle where  $FAD^+$  is reduced  $FADH_2$ .  
 (2) There are three points in the cycle where  $NAD^+$  is reduced to  $NADH + H^+$ .  
 (3) During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesized.  
 (4) The Cycle start with condensation of acetyl group (acetyl CoA) with malic acid to yield citric Acid.

95. The reactions of (i) take place within the cytosol of Eukaryotic cells. Identify (i).

(1) oxidation of pyruvate      (2) the citric acid cycle  
 (3) chemiosmosis      (4) glycolysis

96. Juxta-glomerular apparatus is formed by cellular modifications in the :

(1) Afferent arteriole and PCT  
 (2) Efferent arteriole and DCT  
 (3) Afferent arteriole and DCT  
 (4) Efferent arteriole and PCT

97. Lumen of arteries are narrower due to deposits of calcium, fat, cholesterol and fibrous tissues is called as :

- Coronary Angina Disease
- Heart failure
- Atherosclerosis
- Both (1) and (3)

98. Match **List-I** with **List-II** :

	<b>List-I</b>		<b>List-II</b>
(A)	Wrist bones	(i)	14 in numbers
(B)	Phalanges	(ii)	7 in numbers
(C)	Ankle bones	(iii)	8 in numbers
(D)	Metatarsals	(iv)	5 in numbers

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

99. AIDS is characterized by :

- increase in the number of rhinovirus
- decrease in the number of killer T-cells
- increase in the number of helper T-cells
- decrease in the number of helper T-cells

100. Which of the following does not have an excretory system ?

- Sea lily
- Sea hare
- Sea horse
- Silkworm

101. Match the organism with use in biotechnology.

	<b>Column -I</b>		<b>Column -II</b>
a	<i>Salmonella typhimurium</i>	(i)	DNA polymerase
b	<i>Agrobacterium tumefaciens</i>	(ii)	Cry protein
c	<i>Thermus aquaticus</i>	(iii)	Cloning vector
d	<i>Bacillus thuringiensis</i>	(iv)	Construction of first recombinant DNA molecule

Select the correct option from the following:

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(1) (i)	(ii)	(iii)	(iv)
(2) (iv)	(iii)	(ii)	(i)
(3) (ii)	(i)	(iii)	(iv)
(4) (iv)	(iii)	(i)	(ii)

102. In India the organisation responsible for assessing the safety of introducing genetically modified organism for public use is

- Genetic Engineering Approval Committee (GEAC)
- Research Committee on Genetic Modification (RCGM)

- Council for Scientific and Industrial Research (CSIR)
- Indian Council of Medical Research (ICMR)

103. RNA interference involves:

- Interference of RNA in the synthesis of DNA
- Synthesis of mRNA from DNA
- Silencing of specific mRNA due to complementary dsRNA.
- Synthesis of rRNA from RNA using reverse transcriptase.

104. Following statements describe the characteristics of the Enzyme Restriction Endonuclease. Identify the incorrect Statement:

- The enzyme cuts the sugar-phosphate backbone at specific site on each strand.
- The Enzyme binds DNA at specific sites and cuts only one of the two strands.
- The Enzyme recognizes a specific palindromic nucleotide sequence in the DNA.
- The Enzyme cuts DNA molecules at an identified position within the DNA.

105. Given below are two statements :

**Statement - I** : The SAN can generate the maximum number of action potentials, i.e.,  $85-100 \text{ min}^{-1}$ .

**Statement - II** : Each ventricle pumps out approximately 70 mL of blood which is called the cardiac output.

In the light of the above statements, choose the correct answer from the options given below :

- Both **Statement I** and **Statement II** are correct
- Statement I** is correct but **Statement II** is incorrect
- Statement I** is incorrect but **Statement II** is correct
- Both **Statement I** and **Statement II** are incorrect

106. The skeletal muscle fibre is a 'syncytium', which means it is :

- lined by the plasma membrane
- store house of calcium ions
- multinucleated
- long and slender

107. Second meiotic division in secondary oocyte results in the formation of :

- Second polar body and a diploid ovum
- First polar body and a haploid ovum
- Second polar body and a haploid ovum
- First polar body and a diploid ovum

108. The cytokine barrier among these is :

- NK cells
- Interferon
- PMNL - neutrophils
- All of these



Choose the incorrect option related with above diagram

- (1) (i) → mycelium, septate, unbranched
- (2) (ii) → mycelium, aseptate, coenocytic
- (3) (iii) → mycelium, septate, branched.
- (4) (i) → mycelium, septate, branched.

110. Choose the correct statement:

- (1) Penicillium is unicellular and produces antibiotics.
- (2) Morels and Truffles are poisonous mushrooms.
- (3) Yeast is unicellular and useful in fermentation
- (4) Neurospora is used in the study of biochemical plant physiology.

111. Read the following statement from (A-E) and choose the correct option.

- (a) Conidia are produced exogenously
- (b) The basidiospores are exogenously produced on the basidium.
- (c) Black rust on wheat is due to Albugo.
- (d) In Deuteromycetes mycelium is aseptate and branched,
- (e) Ascomycetes are commonly known as sac-fungi.

- (1) a, b and c are correct.
- (2) b, c and d are incorrect.
- (3) c, d and e are correct.
- (4) a, b and e are correct.

112. Baculoviruses are excellent candidates for :

- (1) Species - specific, narrow spectrum weedicides applications.
- (2) Species - specific, broad spectrum insecticidal applications.
- (3) Species - specific, narrow spectrum insecticidal applications.
- (4) Species - specific, broad spectrum pesticidal applications.

113. Which of the following human ancestor who ate only fruits and hunted with stone weapons ?

- (1) *Homo erectus* (2) *Homo habilis*
- (3) Neanderthal man (4) *Australopithecines*

114. Which of the following STDs are not completely curable ?

- (1) Genital herpes, genital warts, HIV infections
- (2) Syphilis, trichomoniasis, chlamydia
- (3) Genital warts, HIV infections, syphilis
- (4) Genital herpes, hepatitis-B, HIV infections

115. Which of the following is not a component of downstream processing ?

- (1) Purification
- (2) Preservation & Separation
- (3) Separation
- (4) Expression

116. Which PGR promotes root growth and root hair formation in plants ?

- (1) ABA
- (2) Gibberellins
- (3) Cytokinin
- (4) Ethylene

117. During resting stage the binding site of actin for myosin remains masked by :

- (1) troponin
- (2) F' actins
- (3) tropomyosin
- (4) heavy meromyosin

118. The pneumotaxic centre that can moderate the function of respiratory rhythm centre is located in :

- (1) Pons region
- (2) Ventral side of Medulla
- (3) Dorsal side of Medulla
- (4) Aortic arch and carotid artery

119. Match the following Column I with Column -II

	<b>Column -I</b>		<b>Column -II</b>
a	Polygenic inheritance	(i)	A single gene influences many characters.
b	Pleiotropy	(ii)	Many gene govern a single character
c	Codominance	(iii)	In heterozygous condition, only one allele expresses itself
d	Dominance	(iv)	In heterozygous condition, both alleles express themselves fully.

Choose the correct option.

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(1) (i)	(ii)	(iii)	(iv)
(2) (iv)	(ii)	(iii)	(i)
(3) (ii)	(i)	(iii)	(iv)
(4) (ii)	(i)	(iv)	(iii)

120. Acromegaly is caused by :

- (1) Underproduction of hormones by the adrenal cortex
- (2) Low secretion of growth hormone especially in middle age
- (3) Excess secretion of growth hormone in adults
- (4) Excess secretion of thyroxine hormone

121. Bicarpellary, Syncarpous condition is not found in flowers of family:

(1) *Fabaceae* (2) *Solanaceae*  
(3) *Brassicaceae* (4) None of these

122. Hind brain of *Rana tigrina* consists of :

(1) cerebrum, paired cerebral hemispheres, medulla  
(2) cerebellum and medulla oblongata  
(3) olfactory lobes, paired cerebral hemispheres and unpaired diencephalon  
(4) a pair of optic lobes

123. Select the mismatch pair:

**Column - I**                    **Column - II**

(1) <i>Brassicaceae</i>	– $\oplus \text{♀} K_{2+2} C_4 A_{2+4} G_{(2)}$
(2) <i>Fabaceae</i>	– $\% \text{♀} K_{(5)} C_{1+2+2} A_{(9)+1} G_1$
(3) <i>Solanaceae</i>	– $\oplus \text{♀} K_{(5)} C_{(5)} A_5 G_2$
(4) <i>Poaceae</i>	– $Br \oplus P_2 A_3 G_1$

124. Select the wrong statement:

(1) Mitochondria are the powerhouse of the cell in all kingdoms except monera.  
(2) Pseudopodia are locomotory and feeding structures in sporozoans.  
(3) Cell wall is present in members of fungi and plantae  
(4) Trypanosoma belong to protozoa.

125. The partial pressures (in mm Hg) of oxygen ( $O_2$ ) and carbon dioxide ( $CO_2$ ) at alveoli (the site of diffusion) are :

(1)  $pO_2 = 159$  and  $pCO_2 = 40$   
(2)  $pO_2 = 40$  and  $pCO_2 = 45$   
(3)  $pO_2 = 159$  and  $pCO_2 = 0.3$   
(4)  $pO_2 = 104$  and  $pCO_2 = 40$

126. Given below are two statements one is labelled as Assertion (A) and other as Reason (R) :

**Assertion :** The urine is hypertonic in the descending limb of loop of Henle, whereas in ascending limb of loop of Henle, the urine is hypotonic.

**Reason :** Descending limb is permeable to electrolytes while ascending limb is permeable to water.

In the light of the above statements, choose the correct answer from the options given below :

(1) **Assertion** is true but **Reason** is false  
(2) Both **Assertion** and **Reason** are false  
(3) Both **Assertion** and **Reason** are true but **Reason** is not the correct explanation of **Assertion**  
(4) Both **Assertion** and **Reason** are true and **Reason** is the correct explanation of **Assertion**

127. Select the correct sequence of events occurring during prophase-I of meiosis -I:

(a) Crossing over  
(b) Synaptonemal complex formation  
(c) Compaction of chromosomes begins  
(d) Terminalisation of chiasmata.

Choose the most appropriate answer from the options given below

(1)  $c \rightarrow b \rightarrow a \rightarrow d$  (2)  $d \rightarrow c \rightarrow b \rightarrow a$   
(3)  $c \rightarrow b \rightarrow d \rightarrow a$  (4)  $a \rightarrow b \rightarrow c \rightarrow d$

128. Regarding crossing over:

(A) Crossing over leads to recombination of genetic material on the two chromosomes.  
(B) Crossing over is also an enzyme -mediated process and the enzyme involved is called recombinase.  
(C) Crossing over is the exchange of genetic material between two homologous chromosomes.  
(1) A is true, B and C are false.  
(2) A and C are true, B is false.  
(3) A, B and C are true.  
(4) A, B and C are false.

129. In which of the following phases, centromeres split and chromatids separate and then chromatids move to opposite poles?

(1) Anaphase of mitosis, Metaphase -II  
(2) Anaphase -II, Anaphase - I  
(3) Anaphase of mitosis, Anaphase - II  
(4) Anaphase - I, Anaphase of mitosis

130. Emergency contraceptives are effective if used with 72 hours of :

(1) Ovulation (2) Implantation  
(3) Coitus (4) Fertilisation

131. Which of the following type of immunoglobulins plays an important role in allergic reactions ?

(1) IgE (2) IgG (3) IgA (4) IgM

132. Which of the following disorders are caused by hypersecretion of their concerned hormones ?

(1) goitre and acromegaly  
(2) diabetes mellitus and addison's disease  
(3) gigantism and exophthalmic goitre  
(4) diabetes insipidus and goitre

133. Lecithin is best described as:

(1) A glycolipid present in the cell wall  
(2) A phospholipid present in the cell membrane  
(3) A sterol component of plasma membrane  
(4) None of these

134. Which scientist experimentally proved that DNA is sole genetic material using bacteriophage?  
 (1) Watson and Crick (2) Jacob and Monod  
 (3) Stahl and Meselson (4) Chase and Hershey

135. What is it that forms the basis of DNA fingerprinting?  
 (1) The relative proportions of purines and pyrimidines in DNA.  
 (2) Satellite DNA occurs as highly repeated short DNA segments.  
 (3) The relative amount of DNA in the ridges and grooves of the fingerprints.  
 (4) The relative difference in the DNA occurrence in blood, skin and saliva.

136. **Statement - I:** All the three RNA polymerases in eukaryotic nucleus have different roles.

**Statement - II:** In eukaryotes, there are three RNA polymerases in the nucleus in addition to the RNA polymerase found in the organelle.

(1) **Statement I** is true but **Statement II** is false.  
 (2) **Statement I** is false but **Statement II** is true.  
 (3) Both **statements I and II** are true.  
 (4) Both **statements I and II** are false.

137. Select the correct group/set of Australian marsupials exhibiting adaptive radiation.

(1) Spotted cuscus, Lemur, Numbat  
 (2) Anteater, Lemur, Bobcat  
 (3) Numbat, Spotted cuscus, Marsupial mole  
 (4) Bobcat, Flying phalanger, Numbat

138. Select the correct statements with reference to cuboidal epithelium.

A. Commonly found in ducts of glands  
 B. Composed of multilayered of cube-like cells  
 C. Main functions are secretion and absorption  
 D. Limited role in secretion and absorption  
 E. Composed of a single layer of tall and slender cube-like cells

Choose the correct answer from the options given below :

(1) A, C and E only (2) C and E only  
 (3) A, B and C only (4) A and C only

139. By the end of how many weeks, eye-lids separate during the embryonic development ?

(1) 8 weeks (2) 24 weeks  
 (3) 12 weeks (4) 20 weeks

140. Which of the following group of functions is regulated by part of hindbrain ?

(1) Gastric secretions and respiration  
 (2) Cardiovascular reflexes and sexual behaviour  
 (3) Respiration and drinking  
 (4) Emotional reaction and motivation

141. Select the correct match.

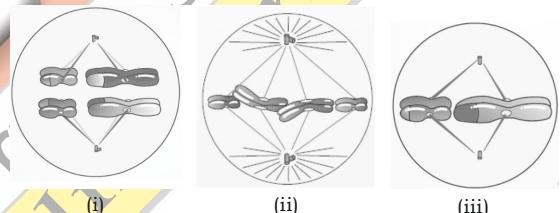
1	Alfred Hershey and Chase	TMV
2	Jacob and Monod	Lac operon
3	Alec Jeffreys	<i>Streptococcus pneumoniae</i>
4	Matthew Meselson and F. Stahl	<i>Pisum sativum</i>

142. Which of the following is a correct statement?

(1) Slime moulds are saprophytic organisms classified under kingdom Monera.  
 (2) Bacteria as a group show the most extensive metabolic diversity.  
 (3) Mycoplasma have DNA, cell wall, endoplasmic reticulum.  
 (4) Cyanobacteria are a group of autotrophic organisms classified under kingdom plantae.

143. Select the wrong statement.

(1) Viroid differ from viruses in having RNA molecules without protein coat.  
 (2) W.M. Stanley showed that viruses could be crystallized.  
 (3) The term 'contagium vivum fluidum' was coined by M.W. Beijerinck.  
 (4) Viruses cause diseases like mumps, smallpox, cholera, herpes.



144.

Choose the correct option related with above diagram

	i	ii	iii
1	Metaphase	Metaphase -I	Metaphase -II
2	Metaphase - I	Metaphase -II	Metaphase
3	Metaphase	Metaphase - II	Metaphase -I
4	Metaphase - I	Metaphase	Metaphase - II

145. **Assertion(A):** The 1st stage of gametophyte in the life cycle of moss is protonema stage.

**Reason(R):** Protonema develop directly from spores produced in capsule after meiosis.

(1) Both Assertion and Reason are true and Reason is correct explanation of Assertion.  
 (2) Both Assertion and Reason are true but Reason is not correct explanation of Assertion.  
 (3) Assertion is true and Reason is false.  
 (4) Both Assertion and Reason false.

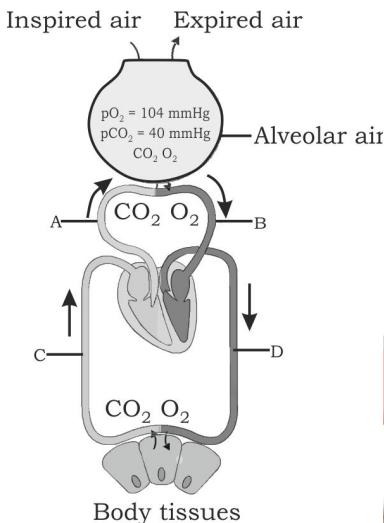
146. The bioactive molecule cyclosporin A is used in the treatment of :

(1) heart attack  
 (2) organ-transplant patients  
 (3) plague  
 (4) diphtheria

147. Which of the following pair is incorrectly matched?

- (1) Labia majora – Fleshy folds of tissue
- (2) Male reproductive system – Pelvis region
- (3) Spermatocytes – Mitotic division
- (4) Labia minora – Paired folds of tissue

148. Identify A, B, C and D in the given diagrammatic representation of exchange of gases at the alveolus and the body tissues :



- (1) A – pulmonary vein, B – pulmonary artery
- (2) C – systemic veins, D – pulmonary artery
- (3) B – pulmonary vein, D – systemic arteries
- (4) A – pulmonary artery, C – systemic arteries

149. The cross arm that forms the cross bridges during muscle contraction, is formed by :

- (1) Tropomyosin and troponin
- (2) Light meromyosin
- (3) Heavy meromyosin
- (4) Both (2) and (3)

150. Given below are two statements :

**Statement - I** : About 90 percent of the body weight of a human adult is contributed by muscles.

**Statement - II** : Visceral muscles do not exhibit any striation and are smooth in appearance.

In the light of the above statements, choose the correct answer from the options given below :

- (1) **Statement I** is correct but **Statement II** is incorrect
- (2) Both **Statement I** and **Statement II** are correct
- (3) **Statement I** is incorrect but **Statement II** is correct
- (4) Both **Statement I** and **Statement II** are incorrect

151. In which of the following gametophyte is not having independent free-living existence

- (1) Marchantia
- (2) Funaria
- (3) Polytrichum
- (4) Pinus

152. Spore like stage is seen in :

- (1) *Plasmodium*
- (2) *Aspergillus*
- (3) *Fucus*
- (4) All of the above

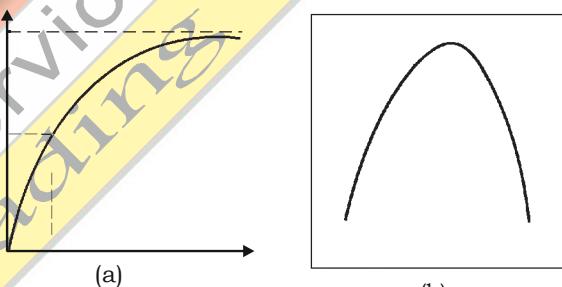
153. Match the List (I) and List (II).

	List - I	List - II
A	Cross of $F_1$ progeny with homozygous recessive parent	i Allele
B	Increase in chromosome Number of set in plant.	ii Test Cross
C	Inheritance of flower colour in snap dragon	iii Incomplete dominance
D	Two or more alternative form of a gene.	iv Polyploidy

Choose the correct answer from the options given below.

- (1) A – (ii), B – (iv), C – (iii), D – (i)
- (2) A – (ii), B – (iv), C – (i), D – (iii)
- (3) A – (iii), B – (ii), C – (iv), D – (i)
- (4) A – (iv), B – (iii), C – (i), D – (ii)

154. The given graph show enzymatic activity for certain factors on x-axis and y-axis. Which of the following is correct in such regard ?



- (1) fig. (c); x-axis - Potential energy, y-axis - progress of reaction
- (2) fig. (b); x-axis - Enzymatic activity, y-axis - temperature
- (3) fig. (a); x-axis - Velocity of reaction, y-axis - substrate concentration
- (4) fig. (b); x-axis- pH, y-axis - Enzymatic activity.

155. The non protein constituent present in many enzyme is called :

- (1) Co-factor
- (2)  $K_m$
- (3) Apoenzyme
- (4) None of these

156. Which of the following structures are situated in the cortical region of the kidney ?  
 (i) Proximal convoluted tubules  
 (ii) Collecting duct  
 (iii) Distal convoluted tubules  
 (iv) Loop of Henle  
 (v) Malpighian corpuscle  
 (1) (ii) and (iv) (2) (i), (ii), (iii) and (iv)  
 (3) (i), (iii) and (v) (4) (ii) and (v)

157. Which of the following agranulocytes responsible for immune response of the body ?  
 (1) Eosinophils (2) Lymphocytes  
 (3) Monocytes (4) Basophils

158. Match **List-I** with **List-II** :

	<b>List-I</b>		<b>List-II</b>
(A)	<i>Nereis</i>	(i)	radula
(B)	<i>Fasciola</i>	(ii)	flame cells
(C)	<i>Chaetoplectura</i>	(iii)	parapodia
(D)	<i>Saccoglossus</i>	(iv)	proboscis gland

(1) (A)–(iv), (B)–(iii), (C)–(i), (D)–(ii)  
 (2) (A)–(iii), (B)–(i), (C)–(ii), (D)–(iv)  
 (3) (A)–(ii), (B)–(i), (C)–(iv), (D)–(iii)  
 (4) (A)–(iii), (B)–(ii), (C)–(i), (D)–(iv)

159. Choose the correctly matched pair :  
 (1) Tubular parts of nephron – Cuboidal epithelium  
 (2) Inner surface of fallopian tubes – Squamous epithelium  
 (3) Air sacs of lungs – Columnar epithelium  
 (4) Walls of blood vessels – Ciliated epithelium

160. If fall in glomerular filtration rate (GFR) then which part of kidney will be activated  
 (1) Posterior pituitary to release Vasopressin  
 (2) Adrenal medulla to release Adrenaline  
 (3) Adrenal cortex to release Aldosterone  
 (4) JG cells to release renin

161. **Statement-I** : In solutions of different pH, the structure of amino acid changes.  
**Statement-II** : Amino acids possess ionizable nature  $\text{NH}_2$  and  $-\text{COOH}$  group.  
 Choose the most appropriate answer from the option given below :  
 (1) Both **Statement I** and **II** are correct.  
 (2) Both **Statement I** and **II** are incorrect.  
 (3) **Statement I** is correct but **II** is incorrect.  
 (4) **Statement I** is incorrect but **II** is correct.

162. The bulk of DNA forms the major peaks during density gradient centrifugation. The other small peaks are known as :  
 (1) Satellite DNA (2) Non-satellite DNA  
 (3) Exon DNA (4) Intron DNA

163. Identify the accurate explanation of mesosome. It is  
 (1) the middle layer of eukaryotic cell wall.  
 (2) the organelles of eukaryotic cell which helps in lipid synthesis.  
 (3) a specialised structure of prokaryotic cell formed by extension of plasma membrane into the cytoplasm.  
 (4) the middle layer of the prokaryotic cell wall.

164. Which of the following statement is incorrect?  
 (1) In bacteria cell wall determines its shape.  
 (2) Glycocalyx primarily protects cells from bursting and collapsing.  
 (3) Glycocalyx differs in composition among different bacteria.  
 (4) Loose sheath outermost protecting layer of bacterial cell envelop is the slime layer.

165. Match **List-I** with **List-II** :

	<b>List-I</b>		<b>List-II</b>
(A)	<i>Aspergillus niger</i>	(i)	Baker's yeast
(B)	<i>Clostridium butylicum</i>	(ii)	Acetic acid
(C)	<i>Acetobacter aceti</i>	(iii)	Butyric acid
(D)	<i>Saccharomyces cerevisiae</i>	(iv)	Citric acid

Choose the correct answer from the options given below :

(1) (A)–(ii), (B)–(iii), (C)–(i), (D)–(iv)  
 (2) (A)–(iv), (B)–(iii), (C)–(ii), (D)–(i)  
 (3) (A)–(ii), (B)–(i), (C)–(iii), (D)–(iv)  
 (4) (A)–(iv), (B)–(iii), (C)–(i), (D)–(ii)

166. Arrange the events in human female menstrual cycle :

A – Growth of corpus luteum  
 B – Sudden increase in level of LH  
 C – Growth of follicle and oogenesis  
 D – Secretion of FSH  
 E – Ovulation

(1) C  $\rightarrow$  D  $\rightarrow$  B  $\rightarrow$  A  $\rightarrow$  E (2) A  $\rightarrow$  E  $\rightarrow$  B  $\rightarrow$  D  $\rightarrow$  C  
 (3) D  $\rightarrow$  C  $\rightarrow$  B  $\rightarrow$  E  $\rightarrow$  A (4) C  $\rightarrow$  B  $\rightarrow$  D  $\rightarrow$  E  $\rightarrow$  A

167. Which of the following statement is not incorrect regarding cardiac cycle ?

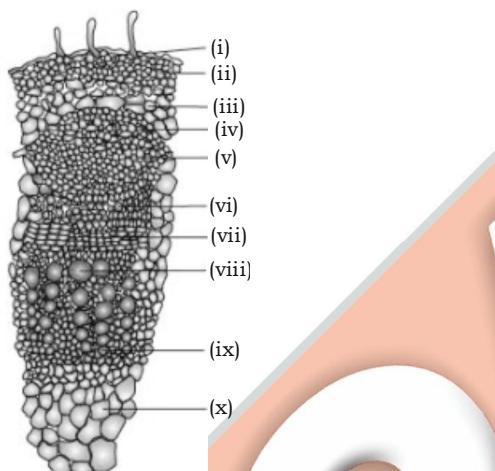
(1) Blood from the pulmonary veins and vena cava flows into the right and the left ventricle respectively through the left and right atria  
 (2) Ventricular pressure falls causing the closure of semilunar valves which prevents the back flow of blood into the ventricles  
 (3) Cardiac output of an athlete will be much lower than that of an ordinary man  
 (4) Second heart sound (dub) is associated with the closure of the tricuspid and bicuspid valves

168. Side effects of use of anabolic steroids in female include :

- (i) Depression
- (ii) Deepening of voice
- (iii) Increased aggressiveness
- (iv) Masculinisation
- (v) Breast enlargement

(1) ii, iv and v      (2) i, ii, iv and v  
 (3) i, ii, iii and iv      (4) i, ii and iv only

169. Show the diagram given below :



Choose the correct option :

- (1) (i) – layer have, trichome, stomata but cuticle absent
- (2) (ii) – layer made of collenchyma and parenchyma
- (3) (v) – Layer made of sclerenchyma
- (4) (viii) – first form primary xylem

170. Select the incorrect match.

- (1) Whorled phyllotaxy - Alstonia
- (2) Leaflets attached at - Silk cotton tip of the petiole.
- (3) Papilionaceous corolla - Bean
- (4) Epiphyllous stamens - Brinjal

171. Identify the correct match from the column I, II and III.

	<b>Column - I</b>	<b>Column-II</b>	<b>Column-III</b>
(A)	Competition	(i) (+, -)	(P) Lichen
(B)	Predation	(ii) (+, 0)	(Q) Cattle egret birds and grazing cattle
(C)	Commensalism	(iii) (+, +)	(R) Visiting flamingoes and resident fishes in South American lakes.
(D)	Mutualism	(iv) (-, -)	(S) Starfish pisaster in American Pacific coast

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
(1) i - P	ii - R	iii - Q	iv - S
(2) ii - R	iii - Q	iv - P	i - S
(3) iv - R	i - S	ii - Q	iii - P
(4) iv - S	i - R	iii - P	iii - Q

172. The afferent nerve fibres transmit impulses :

- (1) from brain to tissue
- (2) from the CNS to the tissue/organs
- (3) from the CNS to the involuntary organs
- (4) from tissue/organs to the CNS

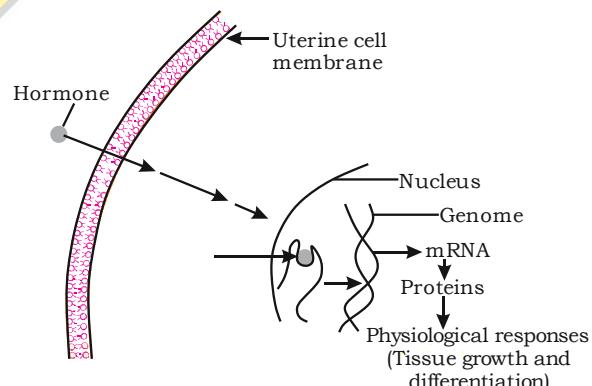
173. Given below are two statements one is labelled as Assertion (A) and other as Reason (R) :

**Assertion :** In cardiac muscle tissue, the communication junctions (intercalated discs) at some fusion points allow the cells to contract as a unit.

**Reason :** When one cell receives a signal to contract, its neighbours are also stimulated to contract.

- (1) Both **Assertion** and **Reason** are true
- (2) Both **Assertion** and **Reason** are true and **Reason** is the correct explanation of **Assertion**
- (3) Both **Assertion** and **Reason** are false
- (4) Both **Assertion** and **Reason** are true but **Reason** is not the correct explanation of **Assertion**

174. Which of the following statement is correct regarding diagrammatic representation of the mechanism of hormone action given below :



- (1) It mostly regulate gene expression or chromosome function by the interaction of hormone-receptor complex
- (2) It normally do not enter the target cell, but generate second messengers
- (3) It interact with membrane-bound receptors
- (4) None of the above

175. Which one of the following process during decomposition is correctly described?

- Catabolism – Last step in the decomposition under fully anaerobic condition.
- Humification – leads to the accumulation of a dark coloured substance humus which undergoes microbial action at a very fast rate.
- Fragmentation – Carried out by organisms such as earthworm
- Leaching – Water soluble inorganic nutrients rise to the top layer of soil.

176. Which of the following statement is not true?

- Robert May places the global species diversity at about 7 million.
- More than 70% of all the species recorded are animals.
- Eastern ghats have a greater amphibian species diversity than the Western Ghats.
- None of these

177. An enzyme complex which is formed by a series of linked enzymic reactions (cascade process) is called :

- Fibrinogen
- Thrombokinase
- Thrombin
- Prothrombin

178. The hard protective outer covering for the brain is called :

- Skull and made of 26 bones
- Cranium and made of 8 bones
- Skull and made of 14 bones
- Cranium and made of 14 bones

179. The method of sequencing of Human Genome involves.

- Sequence Annotation and VNTR
- Expressed Sequence Tags and VNTR
- Repetitive Sequences and Expressed Sequence Tags
- Expressed Sequence Tags and Sequence Annotation

180. Identify the correct statement :

- Sebaceous glands eliminate certain substances like hydrocarbons, amino acid and waxes through sebum.
- Primary function of sweat is to facilitate a cooling effect on the body surface.
- Our lungs remove large amounts of  $\text{CO}_2$  (approx 200 mL/day).
- On an average, 25-30 gm of urea is excreted per hour.

### VERY SIMILAR QUESTION PAPER-1 ( NEET 2026 ) ANSWER KEY

01. (2)	21. (4)	41. (1)	61. (1)	81. (1)	101. (4)	121. (1)	141. (2)	161. (1)
02. (4)	22. (1)	42. (1)	62. (3)	82. (3)	102. (1)	122. (2)	142. (2)	162. (1)
03. (1)	23. (3)	43. (3)	63. (2)	83. (1)	103. (3)	123. (4)	143. (4)	163. (3)
04. (4)	24. (2)	44. (2)	64. (1)	84. (1)	104. (2)	124. (2)	144. (4)	164. (2)
05. (3)	25. (4)	45. (1)	65. (2)	85. (3)	105. (4)	125. (4)	145. (1)	165. (2)
06. (3)	26. (3)	46. (4)	66. (1)	86. (2)	106. (3)	126. (1)	146. (2)	166. (3)
07. (4)	27. (1)	47. (3)	67. (2)	87. (1)	107. (3)	127. (1)	147. (3)	167. (2)
08. (3)	28. (3)	48. (4)	68. (2)	88. (4)	108. (2)	128. (3)	148. (3)	168. (3)
09. (2)	29. (2)	49. (4)	69. (2)	89. (2)	109. (1)	129. (3)	149. (3)	169. (3)
10. (4)	30. (4)	50. (1)	70. (3)	90. (4)	110. (3)	130. (3)	150. (3)	170. (4)
11. (4)	31. (3)	51. (3)	71. (2)	91. (1)	111. (4)	131. (1)	151. (4)	171. (3)
12. (1)	32. (1)	52. (4)	72. (4)	92. (4)	112. (3)	132. (3)	152. (4)	172. (4)
13. (1)	33. (4)	53. (3)	73. (1)	93. (1)	113. (4)	133. (2)	153. (1)	173. (2)
14. (1)	34. (2)	54. (4)	74. (4)	94. (4)	114. (4)	134. (4)	154. (4)	174. (1)
15. (3)	35. (3)	55. (2)	75. (4)	95. (4)	115. (4)	135. (2)	155. (1)	175. (3)
16. (3)	36. (1)	56. (2)	76. (3)	96. (3)	116. (4)	136. (3)	156. (3)	176. (3)
17. (2)	37. (3)	57. (3)	77. (3)	97. (3)	117. (1)	137. (3)	157. (2)	177. (2)
18. (2)	38. (4)	58. (2)	78. (1)	98. (1)	118. (1)	138. (4)	158. (4)	178. (2)
19. (1)	39. (2)	59. (1)	79. (2)	99. (4)	119. (4)	139. (2)	159. (1)	179. (4)
20. (2)	40. (4)	60. (1)	80. (1)	100. (1)	120. (3)	140. (1)	160. (4)	180. (2)

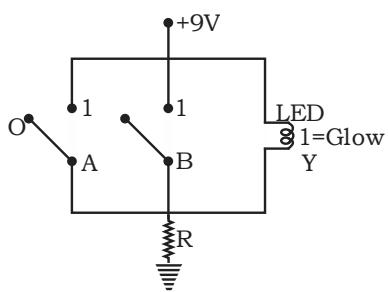
**VERY SIMILAR QUESTION PAPER-2 ( NEET 2026 )**

**[Time : 3 Hrs.]**

**Full Marks : 720**

## PHYSICS

01. Name the logic gate equivalent to the diagram attached



02. The force is given in terms of time  $t$  and displacement  $x$  by the equation

$$F = A \cos Bx + C \sin Dx$$

The dimensional formula of  $\frac{(A + C)B^2}{D}$  is :

(1)  $[\text{ML}^{-3} \text{T}^{-2}]$       (2)  $[\text{ML}^{-1} \text{T}^{-1}]$   
 (3)  $[\text{ML}^{-1} \text{T}^{-2}]$       (4)  $[\text{ML}^{-4} \text{T}^{-3}]$

03. In a nuclear reactor, moderators slow down the neutrons which come out in a fission process. The moderator used have light nuclei. Heavy nuclei will not serve the purpose because :

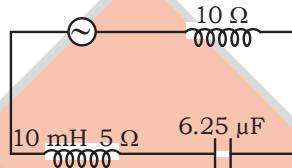
- (1) elastic collision of neutrons with heavy nuclei will not slow them down.
- (2) they will break up.
- (3) substances with heavy nuclei do not occur in liquid or gaseous state at room temperature.
- (4) the net weight of the reactor would be unbearably high.

04. Two planets A and B of radii  $R$  and  $2.5 R$  have

densities  $\rho$  and  $\frac{\rho}{4}$  respectively. The ratio of acceleration due to gravity at the surface of B to A is :

(1)  $\frac{5}{4}$       (2)  $\frac{8}{5}$       (3)  $\frac{5}{8}$       (4)  $\frac{5}{16}$

05. In the circuit given below, the AC source has voltage  $30 \cos \omega t$  with  $\omega = 4000 \text{ rad/s}$ . The amplitude of the current will be nearest to :



(1)  $2\sqrt{2}$  A (2) 3 A (3)  $2\sqrt{5}$  A (4) 2 A

06. Identify the correct statement from the following:

- A. Work done by a man in lifting a bucket out of a well by means of a rope tied to the bucket is negative.
- B. Work done by gravitational force in lifting a bucket out of a well by a rope tied to the bucket is negative.
- C. Work done by friction on a body sliding down an inclined plane is positive.
- D. Work done by net force on a body moving on a rough horizontal plane with uniform velocity is zero.
- E. Work done by the air resistance on an oscillating pendulum is negative.

Choose the correct answer from the options given below :

(1) B, D and E only      (2) A, B and E only  
(3) A and E only      (4) A, B, D and E only

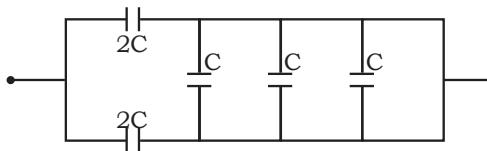
07. A circular conducting loop is placed in uniform magnetic field  $B = 80 \text{ mT}$  perpendicular to plane of loop. The loop is allowed to shrink in radius at rate  $7.5 \text{ mm/second}$  when radius is  $5 \text{ cm}$ . What is the value of instantaneous induced EMF?

(1)  $30 \pi \mu\text{V}$  (2)  $60 \pi \mu\text{V}$  (3)  $15 \pi \mu\text{V}$  (4)  $20 \pi \mu\text{V}$

08. Match the thermodynamic processes taking place in a system with the correct conditions. In the table :  $\Delta Q$  is the heat supplied,  $\Delta W$  is the work done and  $\Delta U$  is change in internal energy of the system.

<b>Process</b>	<b>Condition</b>
I. Adiabatic	A. $\Delta W = 0$
II. Isothermal	B. $\Delta Q = 0$
III. Isochoric	C. $\Delta U \neq 0, \Delta W \neq 0, \Delta Q \neq 0$
IV. Isobaric	D. $\Delta U = 0$
(1) (I-B), (II-A), (III-D), (IV-C)	
(2) (I-A), (II-B), (III-D), (IV-D)	
(3) (I-A), (II-A), (III-B), (IV-C)	
(4) (I-B), (II-D), (III-A), (IV-C)	

09. The equivalent capacitance of the combination shown is :



(1)  $\frac{3C}{4}$  (2)  $\frac{5C}{3}$  (3) C (4) 4C

10. A circular disc of radius  $2R$  is removed from a bigger circular disc of radius  $4R$  such that the circumferences of the discs coincide. The centre of mass of the new disc from the centre of the bigger disc :

(1)  $\frac{R}{3}$  (2)  $\frac{2R}{3}$  (3)  $\frac{R}{6}$  (4)  $\frac{3R}{4}$

11. Two polaroids  $P_1$  and  $P_2$  are placed with their axis perpendicular to each other. Unpolarised light  $I_0$  is incident on  $P_1$ . A third polaroid  $P_3$  is kept in between  $P_1$  and  $P_2$  such that its axis makes an angle  $30^\circ$  with that of  $P_1$ . The intensity of transmitted light through  $P_2$  is :

(1)  $\frac{3I_0}{32}$  (2)  $\frac{3I_0}{16}$  (3)  $\frac{I_0}{32}$  (4)  $\frac{I_0}{16}$

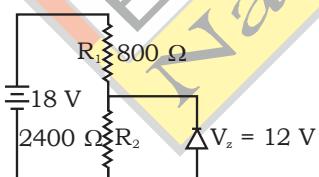
12. A string is clamped at both the ends and it is vibrating in its sixth harmonic. The equation of the stationary wave is  $Y = 0.4 \sin (1.57 x) \cos (100\pi t)$ . The length of the string is (All quantities are in SI units)

(1) 12 m (2) 24 m (3) 6 m (4) 18 m

13. A monochromatic light is incident at a certain angle on an equilateral triangular prism and suffers minimum deviation. If the refractive index of the material of the prism is  $\sqrt{2}$ , then the angle of minimum deviation, is :

(1)  $45^\circ$  (2)  $30^\circ$  (3)  $60^\circ$  (4)  $37^\circ$

14. In the given circuit, the current through zener diode is :



(1) 7.5 mA (2) 5 mA (3) 2.5 mA (4) 3.5 mA

15. Given below are two statements :

**Statement I :** An electric dipole is placed at the centre of a hollow sphere. The flux of electric field through the sphere is zero but the electric field is not zero anywhere in the sphere.

**Statement II :** If  $R$  is the radius of a solid metallic sphere and  $Q$  be the total charge on it. The electric field at any point on the spherical surface of radius  $r$  ( $r < R$ ) is zero and the electric flux passing through this closed spherical surface of radius  $r$  is zero.

In the light of above statements, choose the correct answer from the options given below.

(1) **Statement-I** is true but **Statement-II** is false.  
 (2) **Statement-I** is false but **Statement-II** is true.  
 (3) Both **Statement-I** and **Statement-II** are false.  
 (4) Both **Statement-I** and **Statement-II** are true.

16. A body of mass 2 kg moves along x-axis such that it's velocity varies with displacement  $x$  according to the relation  $v = 16\sqrt{x}$  m/s, the force acting on the body is :

(1) 128 N (2) 144 N (3) 212 N (4) 256 N

17. In a Young's double slit experiment, light of 600 nm is used to produce an interference pattern. When the distance between the slits is 0.03 mm, the angular width (in degree) of the fringes formed on the distance screen is close to :

(1)  $0.73^\circ$  (2)  $0.32^\circ$  (3)  $1.73^\circ$  (4)  $1.15^\circ$

18. A long straight wire of radius  $a$  carries a steady current  $I$ . The current is uniformly distributed over its cross-section. The ratio of the magnetic fields  $B_1$  and  $B_2$ , at radial distance  $\frac{a}{4}$  and  $4a$  respectively, from the axis of the wire is :

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

19. An ideal monatomic gas occupies a volume of  $4 \text{ m}^3$  at a pressure of  $5 \times 10^6 \text{ Pa}$ . The energy of the gas is:

(1)  $3 \times 10^7 \text{ J}$  (2)  $2.5 \times 10^6 \text{ J}$   
 (3)  $1 \times 10^8 \text{ J}$  (4)  $9 \times 10^7 \text{ J}$

20. **Assertion :** In an uniform magnetic field, speed and energy remains the same for a moving charged particle.

**Reason :** Moving charged particle experiences magnetic force  $v$  parallel to its direction of motion.

(1) If **Assertion** is incorrect and **Reason** is correct.  
 (2) If **Assertion** is correct and **Reason** is incorrect.  
 (3) If both **Assertion** and **Reason** are correct but **Reason** is not the correct explanation of **Assertion**.  
 (4) If both **Assertion** and **Reason** are correct and **Reason** is the correct explanation of **Assertion**.

21. A large number of water drops, each of radius  $r$ , combine to have a drop of radius  $R$ . If the surface tension is  $T$  and mechanical equivalent of heat is  $J$ , the rise in heat energy per unit volume will be :

(1)  $\frac{3T}{J} \left( \frac{1}{r} - \frac{1}{R} \right)$  (2)  $\frac{3T}{4J} \left( \frac{1}{r} - \frac{1}{R} \right)$

(3)  $\frac{T}{3J} \left( \frac{1}{r} - \frac{1}{R} \right)$  (4)  $\frac{4T}{3J} \left( \frac{1}{r} - \frac{1}{R} \right)$

22. A battery of 6 V is connected to a resistor dissipating 2.5 W of power. If the terminal voltage of the battery is 4.5 V, the power dissipated within the internal resistance is :

(1) 0.37 W (2) 0.13 W (3) 0.83 W (4) 1.27 W

23. A projectile is projected at  $60^\circ$  from horizontal with initial velocity  $60 \text{ ms}^{-1}$ . The velocity of the projectile at  $t = 3\sqrt{3}\text{s}$  from the start will be (Given  $g = 10 \text{ m/s}^2$ )

(1)  $30 \text{ m/s}$  (2)  $20\sqrt{3} \text{ m/s}$   
(3)  $15\sqrt{6} \text{ m/s}$  (4)  $40 \text{ m/s}$

24. Two isolated metallic solid spheres of radii  $R$  and  $3R$  are charged such that both have same charge density  $\sigma$ . The spheres are then connected by a thin conducting wire. If the new charge density of the bigger sphere is  $\sigma'$ . The ratio  $\frac{\sigma'}{\sigma}$  is :

(1)  $\frac{10}{3}$  (2)  $\frac{8}{3}$  (3)  $\frac{5}{6}$  (4)  $\frac{9}{4}$

25. A small ball of mass  $M$  and density  $d$  is dropped in a viscous liquid of density  $\rho$ . After some time, the ball falls with a constant velocity. What is the viscous force on the ball ?

(1)  $Mg \left( 1 - \frac{\rho}{d} \right)$  (2)  $Mg \left( 1 + \frac{\rho}{d} \right)$   
(3)  $Mg \left( 1 - \frac{d}{\rho} \right)$  (4)  $Mg \left( 1 + \frac{d}{\rho} \right)$

26. Two concentric circular coils with radii 2 cm and 200 cm, and number of turns 30 and 600 respectively are placed coaxially with centers coinciding. The mutual inductance of this arrangement will be (Take,  $\pi^2 = 10$ )

(1)  $3.2 \times 10^{-6} \text{ H}$  (2)  $7.2 \times 10^{-6} \text{ H}$   
(3)  $6.4 \times 10^{-5} \text{ H}$  (4)  $1.6 \times 10^{-5} \text{ H}$

27. What percentage of kinetic energy of a moving particle is transferred to a stationary particle when it strikes the stationary particle of 7 times

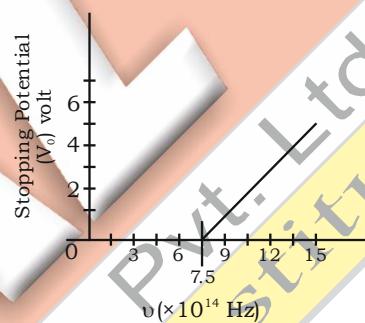
its mass ? (Assume the collision to be head-on elastic collision)

(1) 34.25% (2) 57.5% (3) 52.25% (4) 43.75%

28. A block has been placed on an inclined plane. The slope angle  $\theta$  of the plane is such that the block slides down the plane at a constant speed. The coefficient of kinetic friction is equal to :

(1)  $\tan \theta$  (2)  $\cos \theta$  (3)  $\sin \theta$  (4)  $\cot \theta$

29. The variation of stopping potential ( $V_0$ ) as a function of the frequency ( $\nu$ ) of the incident light for a metal is shown in figure. The work function of the surface is :



(1) 1.9 eV (2) 3.1 eV  
(3) 1.3 eV (4) 4.1 eV

30. A particle performs SHM along a straight line with the period  $T$  and amplitude  $A$ . The mean velocity of the particle averaged over the time interval during which it travels a distance  $\frac{\sqrt{3}}{2}A$  starting from the extreme position is :

(1)  $\frac{3\sqrt{3}A}{T}$  (2)  $\frac{6A}{T}$  (3)  $\frac{6\sqrt{3}A}{T}$  (4)  $\frac{12A}{T}$

31. What is the conductivity of a semiconductor sample having electron concentration of  $8 \times 10^{18} \text{ m}^{-3}$ , hole concentration of  $8 \times 10^{19} \text{ m}^{-3}$ , electron mobility of  $3 \text{ m}^2 \text{ V}^{-1} \text{ s}^{-1}$  and hole mobility of  $0.02 \text{ m}^2 \text{ V}^{-1} \text{ s}^{-1}$  ?

(1)  $2.04 (\Omega \cdot \text{m})^{-1}$  (2)  $4.01 (\Omega \cdot \text{m})^{-2}$   
(3)  $6.06 (\Omega \cdot \text{m})^{-1}$  (4)  $8.08 (\Omega \cdot \text{m})^{-1}$

32. With what speed should a body be thrown upwards so that the distances traversed in the 6th second and 7th second are equal ? ( $g = 10 \text{ m/s}^2$ )

(1) 60 m/s (2) 30 m/s  
(3) 35 m/s (4) 70 m/s

33. Gravitational potential of the body of mass  $m$  at a height  $h$  from surface of earth of radius  $R$  is ( $g$  = acceleration due to gravity at earth's surface) : ( $h \ll R$ )

(1)  $-g(R + h)$  (2)  $g(R + h)$   
(3)  $g(R - h)$  (4)  $-g(R - h)$

34. A wire of length 40 cm, stretched between rigid supports, has its  $n^{\text{th}}$  and  $(n + 1)^{\text{th}}$  harmonics at 600 Hz and 680 Hz, respectively. If tension in the string is 3200 N, its linear mass density is  $x$  kg/m, where  $x$  is :

(1) 0.24 (2) 0.78 (3) 0.08 (4) 0.42

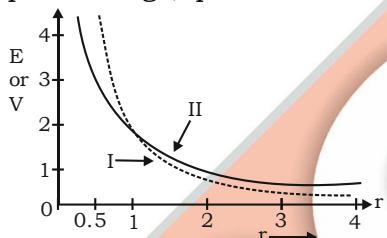
35. A bar magnet is demagnetized by inserting it inside a solenoid of length 0.25 m, 500 turns, and carrying a current of 2 A. The coercivity of the bar magnet is :

(1) 4000 A/m (2) 2000 A/m  
(3) 1260 A/m (4) 630 A/m

36. A vessel contains 8 mole of  $O_2$ . The system is given heat at constant pressure. As a result the gas expands and does 150 joule work. Heat given to the gas is :

(1) 650 J (2) 590 J (3) 675 J (4) 525 J

37. Figure shown below, shows how the electrostatic potential and the electrostatic field varies with  $r$  for a point charge,  $q$ .



Which of the above given curves represent  $E$  versus  $r$  and  $\vec{V}$  versus  $r$  :

(1) I  $\rightarrow$   $E$  versus  $r$ , II  $\rightarrow$   $\vec{V}$  versus  $r$   
(2) I  $\rightarrow$   $V$  versus  $r$ , II  $\rightarrow$   $E$  versus  $r$   
(3) Both '1' and '2'  
(4) None of these

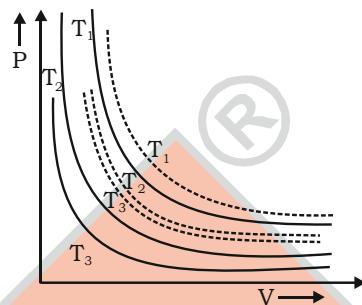
38. An automobile moves on a road with a speed of  $72 \text{ kmh}^{-1}$ . The radius of its wheels is 0.4 m and the moment of inertia of the wheel about its axis of rotation is  $4 \text{ kg m}^{-2}$ . If the vehicle is brought to rest in 10 s, the magnitude of average torque transmitted by its brakes to wheel is :

(1) 10 N-m (2) 16 N-m (3) 32 N-m (4) 20 N-m

39. An ice cube has a bubble inside. When viewed from one side the apparent distance of the bubble is 16 cm. When viewed from the opposite side, the apparent distance of the bubble is observed as 8 cm. If the side of the ice cube is 40 cm, the refractive index of the ice cube is :

(1) 1.5 (2) 1.56 (3) 1.67 (4) 1.78

40. The following graph represents the P-V curves of an ideal gas (where  $P$  is the pressure and  $V$  the volume) at three temperatures  $T_1$ ,  $T_2$  and  $T_3$  compared with those of Boyle's represented as dotted lines.



The correct relation is :

(1)  $T_3 > T_2 > T_1$  (2)  $T_2 > T_1 > T_3$   
(3)  $T_1 > T_2 > T_3$  (4)  $T_2 < T_1 < T_3$

41. A hot wire of copper is stretched at a temperature of  $200^{\circ}\text{C}$  between two fixed walls. At what temperature will the wire break when it is cooled? The breaking stress of copper is  $4 \times 10^8 \text{ N/m}^2$ . Young's modulus of copper =  $12 \times 10^{10} \text{ N/m}^2$ , coefficient of linear expansion of copper =  $2 \times 10^{-5}^{\circ}\text{C}$ .

(1)  $33.33^{\circ}\text{C}$  (2)  $67^{\circ}\text{C}$  (3)  $21.2^{\circ}\text{C}$  (4)  $82^{\circ}\text{C}$

42. An energy of 18 eV is given to an electron in 3rd orbit of H-atom. Then, find its final energy when it comes out of H-atom.

(1) 14.67 eV (2) 16.49 eV  
(3) 11.26 eV (4) 19.51 eV

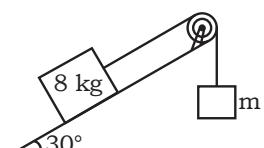
43. Pressure at the bottom of tank of water is  $4P$ , where  $P$  is atmospheric pressure. If the water is drawn out till the level of water is lowered by one-third, then the pressure at the bottom of the tank is :

(1)  $2P$  (2)  $\frac{7P}{3}$  (3)  $3P$  (4)  $\frac{10P}{3}$

44. A power transmission line feeds input power at 2400 V to a step-down transformer with its primary windings having 6000 turns. The output power is delivered at 240 V by the transformer. If the current in the primary of the transformer is 6 A and its efficiency is 80%, the output current would be :

(1) 60 A (2) 54 A (3) 40 A (4) 48 A

45. In Fig. below, coefficient of kinetic friction between the 8 kg block and the inclined surface is  $\frac{1}{2\sqrt{3}}$ . Here 'm' is such a mass that the 8 kg block is moving up the plane with a constant speed, then  $m$  is :



(1) 6 kg (2) 8 kg (3) 4 kg (4)  $8\sqrt{3}$  kg

## CHEMISTRY

46. Ethylamine reacts with  $\text{HNO}_2$  to form  
 (1)  $\text{CH}_3-\text{O}-\text{N}=\text{O}$       (2)  $\text{C}_2\text{H}_5-\text{O}-\text{C}_2\text{H}_5$   
 (3)  $\text{C}_2\text{H}_5-\text{OH}$       (4)  $\text{CH}_3-\text{CHO}$

47. The electronegativity difference between N and F is greater than N and H, yet the dipole moment of  $\text{NH}_3$  (1.5D) is greater than that of  $\text{NF}_3$  (0.2D). This is because:  
 (1) In  $\text{NH}_3$  as well as  $\text{NF}_3$ , the orbital dipole and bond dipole are in opposite direction.  
 (2) In  $\text{NH}_3$ , the orbital dipole and bond dipole are in the opposite direction, whereas in  $\text{NF}_3$  these are in same direction.  
 (3) In  $\text{NH}_3$ , as well as in  $\text{NF}_3$  the orbital dipole and bond dipole are in same direction.  
 (4) In  $\text{NH}_3$ , the orbital dipole and bond dipole are in same direction whereas in  $\text{NF}_3$  these are in opposite direction.

48. For the given reactions identify A, B and C respectively

Propyne  $\xrightarrow{\text{A}}$  1,1,2,2-Tetrabromopropane  
 $\xrightarrow{\text{B}}$  2,2-Dibromopropane  
 $\xrightarrow[\text{333K}]{\text{Hg}^{2+}/\text{H}_3\text{O}^+}$  C

(1)  $\text{HBr}, \text{Br}_2, \text{CH}_3\text{CHO}$   
 (2)  $\text{Br}_2, \text{HBr}, \text{CH}_3\text{COCH}_3$   
 (3)  $\text{HBr}, \text{HBr}, \text{CH}_3\text{CHO}$   
 (4)  $\text{Br}_2, \text{HBr}, \text{CH}_3\text{CH}_2\text{CHO}$

49. Match the Column-I with Column-II

Column-I (Reactions)	Column-II (Reactant)
(A). Benzophenone $\rightarrow$ Diphenylmethane	(I). $\text{LiAlH}_4$
(B). Benzaldehyde $\rightarrow$ 1-Phenylethanol	(II). DIBAL-H
(C). Cyclohexanone $\rightarrow$ Cyclohexanol	(III). $\text{Zn}(\text{Hg})/\text{Conc. HCl}$
(D). Phenylbenzoate $\rightarrow$ Benzaldehyde	(IV). $\text{CH}_3\text{MgBr}$

(1) A  $\rightarrow$  I, B  $\rightarrow$  IV, C  $\rightarrow$  III, D  $\rightarrow$  II  
 (2) A  $\rightarrow$  II, B  $\rightarrow$  IV, C  $\rightarrow$  I, D  $\rightarrow$  III  
 (3) A  $\rightarrow$  IV, B  $\rightarrow$  III, C  $\rightarrow$  II, D  $\rightarrow$  I  
 (4) A  $\rightarrow$  III, B  $\rightarrow$  IV, C  $\rightarrow$  I, D  $\rightarrow$  II

50. The solubility of  $\text{N}_2$  in water at 300 K and 500 torr partial pressure is  $0.01 \text{ g L}^{-1}$ . The solubility (in  $\text{g L}^{-1}$ ) at 750 torr partial pressure is

(1) 0.0075   (2) 0.005   (3) 0.02   (4) 0.015

51. The inner orbital complex is  
 (1)  $[\text{MnCl}_6]^{3-}$       (2)  $[\text{FeF}_6]^{3-}$   
 (3)  $[\text{CoF}_6]^{3-}$       (4)  $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$

52. The incorrect matching pair is  
 (1) Cell constant  $\longrightarrow \text{m}^{-1}$   
 (2) Molar conductivity  $\longrightarrow \text{Scm}^2\text{mol}^{-1}$   
 (3) Conductivity  $\longrightarrow \Omega^{-1}\text{m}^{-1}$   
 (4) Degree of dissociation  $\longrightarrow \text{S}\Omega^{-1}\text{m}^{-2}$

53. 2-Ethyl benzaldehyde  $\xrightarrow[\Delta]{\text{KMnO}_4-\text{KOH}}$  P. Identify the product P is

(1)   
 (2)   
 (3)   
 (4) 

54. **Assertion (A):**  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  is blue in colour.  
**Reason (R):** The ligand ( $\text{H}_2\text{O}$  molecules) cause splitting of d-orbitals in  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ , resulting in d-d-transition and emitting colour

(1) A is true but R is false.  
 (2) A is false but R is true.  
 (3) Both A and R are true and R is the correct explanation of A.  
 (4) Both A and R are true and R is not the correct explanation of A.

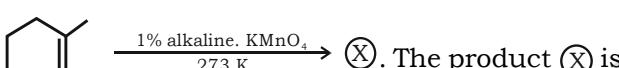
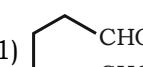
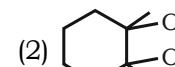
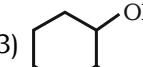
55. Match the Column-I with Column-II

Column-I (Reactions)	Column-II (Reagent)
(A). Primary alchol $\rightarrow$ Carboxylic acid	(I). $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4$
(B). Benzyl alchol $\rightarrow$ Benzoic acid	(II). 85% $\text{H}_3\text{PO}_4$
(C). Propan-2-ol $\rightarrow$ Propene	(III). $\text{NaBH}_4$
(D). Butan-2-one $\rightarrow$ Butan-2-ol	(IV). Acidic $\text{KMnO}_4$

(1) A  $\rightarrow$  I, B  $\rightarrow$  II, C  $\rightarrow$  III, D  $\rightarrow$  IV  
 (2) A  $\rightarrow$  IV, B  $\rightarrow$  I, C  $\rightarrow$  II, D  $\rightarrow$  III  
 (3) A  $\rightarrow$  III, B  $\rightarrow$  II, C  $\rightarrow$  I, D  $\rightarrow$  IV  
 (4) A  $\rightarrow$  IV, B  $\rightarrow$  III, C  $\rightarrow$  II, D  $\rightarrow$  I

56. One of the following pairs will not show positive deviation from 'Raoult's Law'  
 (1) Benzene–chloroform  
 (2) Benzene–acetone  
 (3) Benzene–ethanal  
 (4) Benzene–carbon tetrachloride

57. On complete combustion 0.246 g of an organic compound gave 0.198 g of carbon dioxide and 0.1014 g of water. Determine the percentage composition of carbon and hydrogen respectively in the compound is  
 (1) 31.96%, 8.96%      (2) 21.95%, 4.58%  
 (3) 33.46%, 8.72%      (4) 13.86%, 14.86%

58.  The product  $\textcircled{X}$  is  
 (1)       (2)   
 (3)       (4) 

59. Match the Column-I with Column-II

<b>Column-I (Reaction)</b>	<b>Column-II (Unit of <math>K_p</math>)</b>
A. $3 \text{O}_2(\text{g}) \rightleftharpoons 2\text{O}_3(\text{g})$	I. no unit
B. $\text{SO}_2(\text{g}) + 1/2 \text{O}_2(\text{g}) \rightleftharpoons \text{SO}_3(\text{g})$	II. $\text{atm}^{-1/2}$
C. $2\text{HF}(\text{g}) \rightleftharpoons \text{H}_2(\text{g}) + \text{F}_2(\text{g})$	III. $\text{atm}^{-1}$
D. $\text{CO}(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons \text{CH}_4(\text{g}) + \text{H}_2\text{O}(\text{g})$	IV. $\text{atm}^{-2}$

(1) A  $\rightarrow$  I, B  $\rightarrow$  II, C  $\rightarrow$  III, D  $\rightarrow$  IV  
 (2) A  $\rightarrow$  III, B  $\rightarrow$  II, C  $\rightarrow$  I, D  $\rightarrow$  IV  
 (3) A  $\rightarrow$  IV, B  $\rightarrow$  III, C  $\rightarrow$  II, D  $\rightarrow$  I  
 (4) A  $\rightarrow$  II, B  $\rightarrow$  I, C  $\rightarrow$  III, D  $\rightarrow$  IV

60. **Assertion (A)** : Angular momentum of the electron in the orbit which has four subshell is  $\frac{h}{\pi}$ .  
**Reason (R)**: Angular momentum is quantised.  
 (1) A is true but R is false.  
 (2) A is false but R is true.  
 (3) Both A and R are true but R is the correct explanation of A.  
 (4) Both A and R are true but R is not the correct explanation of A.

61. The acidified  $\text{KMnO}_4$  act as oxidising agent. The compound which changes into  
 (1)  $\text{KI} \longrightarrow \text{I}_2$       (2)  $\text{Fe}^{+3} \longrightarrow \text{Fe}^{+2}$   
 (3)  $\text{S}_2\text{O}_3^{2-} \longrightarrow \text{SO}_3^{2-}$       (4)  $\text{I}^- \longrightarrow \text{IO}_3^-$

62. The boiling point of benzene is 353.23K when 1.80g of a non volatile solute was dissolved in 90 g of benzene, the boiling point is raised to 354.11K. Calculate the molar mass of the solute,  $K_b$  for benzene is 2.53 K  $\text{kgmol}^{-1}$   
 (1) 29 g  $\text{mol}^{-1}$       (2) 57.5 g  $\text{mol}^{-1}$   
 (3) 87 g  $\text{mol}^{-1}$       (4) 13 g  $\text{mol}^{-1}$

63. The specific conductance of saturated solution of  $\text{BaSO}_4$  is  $3.06 \times 10^{-6} \text{ Scm}^{-1}$  and its equivalent conductance is  $1.53 \text{ Scm}^2 \text{ eq}^{-1}$ . The  $K_{\text{sp}}$  of  $\text{BaSO}_4$  will be:  
 (1)  $4 \times 10^{-12}$       (2)  $2.5 \times 10^{-13}$   
 (3)  $25 \times 10^{-9}$       (4)  $10^{-6}$

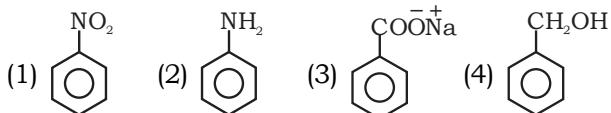
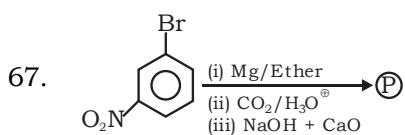
64. A solution contains  $\text{I}_2$  in benzene. The mole fraction of  $\text{I}_2$  is 0.2. Calculate molarity of solution if density of solution is d g/mL.  
 (Molecular weight of  $\text{I}_2$  = 254 g/mol).  
 (1) 1.77 d      (2) 17.7 d  
 (3) 1.17 d      (4) 2.77 d

65. For a first order reaction :  $\text{A} \rightarrow \text{P}$ , the temperature (T) dependent rate constant (K) was found to follow the equation  $\log K = - (2000) \frac{1}{T} + 6.0$ . The pre-exponential factor (A) and the activation energy ( $E_a$ ) respectively are :  
 (1)  $1.0 \times 10^6 \text{s}^{-1}$  and  $9.2 \text{ kJ mol}^{-1}$   
 (2)  $6.0 \text{ s}^{-1}$  and  $16.6 \text{ kJ mol}^{-1}$   
 (3)  $1.0 \times 10^6 \text{s}^{-1}$  and  $16.6 \text{ kJ mol}^{-1}$   
 (4)  $1.0 \times 10^6 \text{s}^{-1}$  and  $38.3 \text{ kJ mol}^{-1}$

66. Match the Column-I with Column-II.

<b>Column I (Classification of molecules based on octet rule)</b>	<b>Column II (Example)</b>
A. Molecules follow octet rule	I. $\text{NO}$
B. Molecules with incomplete octet	II. $\text{BCl}_3$
C. Molecules with incomplete octet with odd electron	III. $\text{H}_2\text{SO}_4$
D. Molecules with expanded octet	IV. $\text{CO}_2$

(1) (A-IV), (B-II), (C-I), (D-III)  
 (2) (A-I), (B-II), (C-III), (D-IV)  
 (3) (A-II), (B-I), (C-IV), (D-III)  
 (4) (A-IV), (B-III), (C-II), (D-I)



68. The d-electronic configuration of an octahedral Co(II) complex having magnetic moment of 3.95 BM is :

(1)  $t_{2g}^6 e_g^1$  (2)  $t_{2g}^3 e_g^0$  (3)  $t_{2g}^5 e_g^2$  (4)  $e_g^4 t_{2g}^3$

69. **Assertion (A) :** Experimentally determined oxygen-oxygen bond lengths in  $\text{O}_3$  are found to be same and the bond length is greater than that of a  $\text{O}=\text{O}$  (double bond) but less than that of a single ( $\text{O}-\text{O}$ ) bond.

**Reason (R) :** The strong lone pair-lone pair repulsion between oxygen atom is solely responsible for the fact that the bond length in ozone is smaller than that of a double bond ( $\text{O}=\text{O}$ ) but more than that of a single bond ( $\text{O}-\text{O}$ ).

(1) Both (A) and (R) are true and (R) is the correct explanation of (A).  
 (2) Both (A) and (R) are true and (R) is not the correct explanation of (A).  
 (3) (A) is true but (R) is false.  
 (4) (A) is false but (R) is true.

70. The number of element from the following that do not belong to actinoids is :

Er, Cm, Ho, Md, No, Tm and Dy

(1) 4 (2) 6 (3) 5 (4) 3

71. Which one of the following carbocation from the following is most stable ?

(1)  $\text{CH}_2^+ - \text{CH} = \text{CH} - \text{CH}_2 - \text{OCH}_3$   
 (2)  $\text{CH}_2^+ - \text{CH} = \text{CH} - \text{OCH}_3$   
 (3)  $\text{CH}_2^+ - \text{CH} = \text{CH} - \text{OCOCH}_3$   
 (4)  $\text{CH}_2^+ - \text{CH} = \text{CH} - \text{F}$

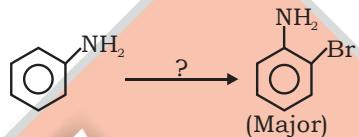
72. In which of the following arrangements, the sequence is not according to the property written against it :

(1) O > S > Se > Te : Boiling point  
 (2) HI > HBr > HCl > HF : Acidic strength  
 (3)  $\text{Cl}_2 > \text{Br}_2 > \text{F}_2 > \text{I}_2$  : Bond dissociation enthalpy  
 (4) N > O > C > B : First ionisation enthalpy

73. Which of the following ion that are expected to behave as oxidising agent is ?

(1)  $\text{Ti}^+$  (2)  $\text{Ti}^{3+}$   
 (3)  $\text{Pb}^{2+}$  (4) Both '1' and '2'

74. For the given reaction select the correct set of reagents is :



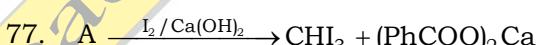
(1)  $\text{Br}_2/\text{FeBr}_3, \text{H}_2\text{O}(\Delta), \text{NaOH}$   
 (2)  $\text{H}_2\text{SO}_4, \text{Ac}_2\text{O}, \text{Br}_2, \text{H}_2\text{O}(\Delta), \text{NaOH}$   
 (3)  $\text{Ac}_2\text{O}, \text{Br}_2, \text{H}_2\text{O}(\Delta), \text{NaOH}$   
 (4)  $\text{Ac}_2\text{O}, \text{H}_2\text{SO}_4, \text{Br}_2, \text{NaOH}$

75. Which of the following compound given orange ppt with 2,4-DNP but do not give silver mirror with Tollen's reagent.

(1)  $\text{Ph}-\text{CH}_2-\overset{\text{||}}{\underset{\text{O}}{\text{C}}}-\text{H}$  (2)  $\text{Ph}-\overset{\text{||}}{\underset{\text{O}}{\text{C}}}-\text{H}$   
 (3)  $\text{Ph}-\overset{\text{||}}{\underset{\text{O}}{\text{C}}}-\text{CH}_3$  (4)  $\text{CH}_3-\text{CH}_2-\overset{\text{||}}{\underset{\text{O}}{\text{C}}}-\text{H}$

76. Enthalpy of neutralization of which of the following acid, base is maximum ?

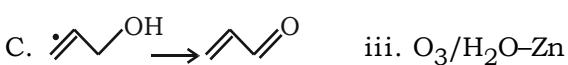
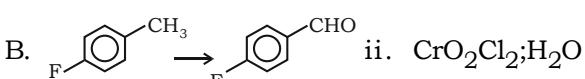
(1) HCN and NaOH (2) HCl and KOH  
 (3) HCl and  $\text{NH}_4\text{OH}$  (4)  $\text{HCOOH}$  and NaOH



the compound 'A' is

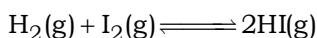
(1)  $\text{CH}_3-\text{CH}_2-\overset{\text{||}}{\underset{\text{O}}{\text{C}}}-\text{Ph}$  (2)  $\text{Ph}-\text{CH}_2-\text{OH}$   
 (3)  $\text{CH}_3-\overset{\text{||}}{\underset{\text{O}}{\text{C}}}-\text{Ph}$  (4)  $\text{CH}_3-\text{CH}_2-\overset{\text{||}}{\underset{\text{O}}{\text{C}}}-\text{Ph}$

78. Match the Column-I with Column-II

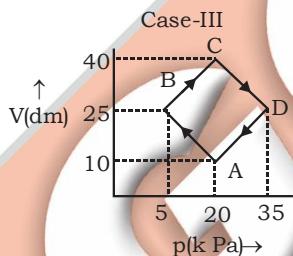
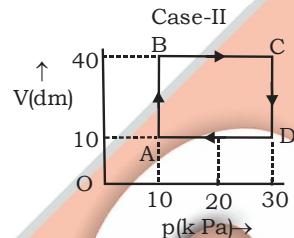
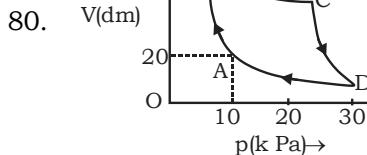
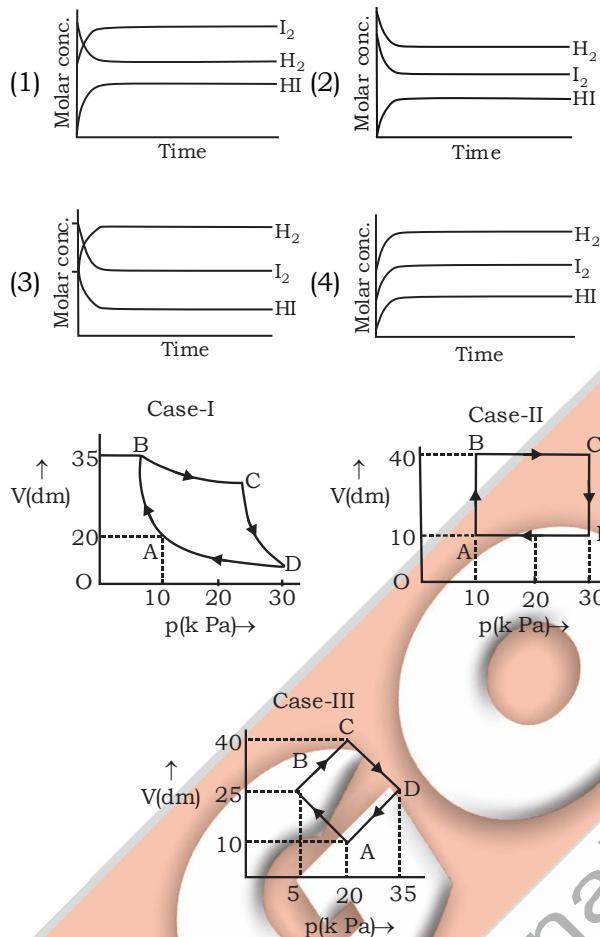


(1) A  $\rightarrow$  i, B  $\rightarrow$  ii, C  $\rightarrow$  iii, D  $\rightarrow$  iv  
 (2) A  $\rightarrow$  iii, B  $\rightarrow$  ii, C  $\rightarrow$  i, D  $\rightarrow$  iv  
 (3) A  $\rightarrow$  iv, B  $\rightarrow$  ii, C  $\rightarrow$  i, D  $\rightarrow$  iii  
 (4) A  $\rightarrow$  i, B  $\rightarrow$  iv, C  $\rightarrow$  iii, D  $\rightarrow$  ii

79. For the reaction,



Attainment of equilibrium is predicted correctly by :



An ideal gas undergoes a cyclic transformation starting from the point A and coming back to the same point by tracing the path A → B → C → D → A as shown in the three cases above.

Choose the correct option regarding  $\Delta U$ .

- (1)  $\Delta U$  (Case-III) >  $\Delta U$  (Case-II) >  $\Delta U$  (Case-I)
- (2)  $\Delta U$  (Case-I) >  $\Delta U$  (Case-II) >  $\Delta U$  (Case-III)
- (3)  $\Delta U$  (Case-I) >  $\Delta U$  (Case-III) >  $\Delta U$  (Case-II)
- (4)  $\Delta U$  (Case-I) =  $\Delta U$  (Case-II) =  $\Delta U$  (Case-III)

81. Heat treatment of muscular pain involves radiation of wavelength of about 900 nm. Which spectral line of H atom is suitable for this ?

Given : Rydberg constant

$$R_H = 10^5 \text{ cm}^{-1}, h = 6.6 \times 10^{-34} \text{ Js}, c = 3 \times 10^8 \text{ m/s}$$

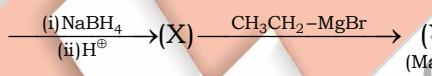
- (1) Paschen series,  $\infty \rightarrow 3$
- (2) Lyman series,  $\infty \rightarrow 1$
- (3) Balmer series,  $\infty \rightarrow 2$
- (4) Paschen series,  $5 \rightarrow 3$

82. In which of the following I is more acidic than II.

I	II
(1) $CH_3CO_2H$	$CH_2FCO_2H$
(2) $CH_2FCO_2H$	$CH_2ClCO_2H$
(3) $CH_3CHFCH_2CO_2H$	$CH_2FCH_2CO_2H$



83. Ethyl-3-oxobutanoate



the 'Y' is

(1)	(2)
(3)	(4) $CH_3-CH_3$

84. The complex that can show facial and meridional isomerism is :

- (1)  $[Co(NH_3)_3(NO_2)_3]$
- (2)  $[Pt(NH_3)_2Cl_2]$
- (3)  $[Co(NH_3)_4Cl_2]^+$
- (4)  $[CoCl_2(en)_2]$

85. The incorrect matching pair is

**Column-I**

**[Elements ]**

(1) Nitrogen

→ Prussian Blue

(2) Sulphur

→ Violet

(3) Chlorine

→ Blue

(4) Phosphorus

→ Yellow

86.  $2.9 \times 10^{-3}$  mol of  $CO_2$  is left after removing  $10^{21}$  molecules from its 'x' mg sample. The mass of  $CO_2$  taken initially is

Given :  $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$

(1) 200.6 mg (2) 98.3 mg

(3) 150.4 mg (4) 48.2 mg

87. The effect of temperature on spontaneity of reactions are represented as :

**ΔH ΔS Temperature Spontaneity**

(A) + - any T	Nonspontaneous
(B) + + $T < T_e$	Spontaneous
(C) - - $T < T_e$	Nonspontaneous
(D) - + any T	Spontaneous

Select correct ones :

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

88. Which of the following statements are correct regarding Kolbe's electrolytic method ?

- Alkanes containing even number of C-atoms are prepared.
- Potassium salt of a carboxylic acid on electrolysis gives alkane.
- Ethane cannot be prepared by this method.
- $H_2$  gas is liberated at anode.

Choose the correct statement.

- A, B
- B, C
- A, C
- A,B,C

89. Calculate the enthalpy change when 1 mole of water at  $27^\circ C$  and 1 atm pressure is converted to ice at  $0^\circ C$ . Given the enthalpy of fusion of ice is  $5.96 \text{ kJ mol}^{-1}$  and heat capacity of water is  $4.2 \text{ J}^\circ \text{C}^{-1} \text{ g}^{-1}$ .

- $-8.00 \text{ kJ mol}^{-1}$
- $6.36 \text{ kJ mol}^{-1}$
- $-5.96 \text{ kJ mol}^{-1}$
- $5.96 \text{ kJ mol}^{-1}$

90. Which of the following are not an isostructural pair ?

- $XeF_2, IF_2^-$
- $SiF_4, PCl_4^+$
- $SO_4^{2-}, CrO_4^{2-}$
- $NH_3, NO_3^-$

## BIOLOGY

91. Which of the following statement is incorrect ?

- Systematics is the study of systematic arrangement of organisms and the evolutionary relationship amongst them.
- Genus is the smallest unit of taxonomic hierarchy.
- Increase in body mass is common feature of non-living and living objects.
- None of the above.

92. Which photosystem is involved in non-cyclic photophosphorylation ?

- PS I
- PS II
- Both '1' and '2'
- Xanthophyll and PS-I

93. Turner's syndrome where individuals are phenotypically female but have rudimentary sex organs and mammary glands, is due to absence of :

- Both X-chromosome
- One X-chromosomes
- X-Y-chromosome
- Y-chromosome

94. Match the Columns :

### Column I

- Incomplete dominance
- Co-dominance
- Multiple alleleism
- Mendelian disorder

### Column II

- AB blood group
- Snapdragon
- ABO blood group
- Turner's syndrome
- Cystic fibrosis
- (a-ii), (b-iii), (c-i), (d-iv), (e-v)
- (a-iii), (b-ii), (c-i), (d-iv), (e-v)
- (a-ii), (b-i), (c-iii), (d-v), (e-iv)
- (a-iii), (b-i), (c-ii), (d-iv), (e-v)

95. **Assertion :** AUG acts as a start codon in translation.

**Reason :** UAA acts as a stop codon in translation.

- Both **Assertion** and **Reason** are correct and **Reason** is correct explanation of **Assertion**.
- Both **Assertion** and **Reason** are correct but **Reason** is not correct explanation of **Assertion**.
- Assertion** is correct but **Reason** is not correct.
- Both **Assertion** and **Reason** are not correct.

96. Fungi are also known to form symbiotic associations with plants (i). Many members of the genus (ii) form mycorrhiza. The fungal symbiont in these associations absorbs (iii) from soil and passes it to the plant. Identify (i), (ii) & (iii).

(i)	(ii)	(iii)
(1) Mycorrhiza	Glomus	Potassium
(2) Mycorrhiza	Nostoc	Phosphorus
(3) Mycorrhiza	Glomus	Phosphorus
(4) Lichen	Anabaena	Potassium

97. How many statement are incorrect related with frogs ?

- The frog never drinks water but absorb it through the skin.
- The colour of dorsal side of body is generally yellow.
- The hind limbs end in four digits.
- Hind limb are larger and muscular than fore limbs that end in five digits.

(1) One	(2) Two
(3) Three	(4) Four

98. Viviparity is considered to be more evolved because :  
 (1) the young ones are protected by a thick shell  
 (2) the embryo takes a very long time to develop  
 (3) the young ones are protected by a thin shell.  
 (4) the young ones are protected inside the mother's body and are looked after they are born leading to more chances of survival.

99. **Statement I :** A patient is hooked upto a monitoring machine that shows voltage traces on a screen and makes the sound ".....pip.....pip....pip....p....peeeeeeeeeeee" as the patient goes into heart attack.  
**Statement II :** Cardiac arrest, when the heart muscle is suddenly damaged by an inadequate blood supply.  
 (1) Both **Statement I** and **Statement II** are correct.  
 (2) Both **Statement I** and **Statement II** are incorrect.  
 (3) Only **Statement I** is correct.  
 (4) Only **Statement II** is correct.

100. Match the following :

<b>Column I</b>	<b>Column II</b>
(a) ICSI	(i) Injecting sperm directly into the ovum.
(b) ZIFT	(ii) Transfer of early embryos into the fallopian tube.
(c) IUI	(iii) Transfer of ovum from a donor into the fallopian tube of another female.
(d) GIFT	(iv) Transfer of sperm from the donor into the vagina of the female.
(e) AI	(v) Due to very low sperm count in the ejaculates could be corrected.

(1) (a-i), (b-ii), (c-iv), (d-iii), (e-v)  
 (2) (a-ii), (b-i), (c-iii), (d-iv), (e-v)  
 (3) (a-v), (b-i), (c-iii), (d-iv), (e-ii)  
 (4) (a-iv), (b-i), (c-ii), (d-iii), (e-v)

101. Match the Columns :

<b>Column I</b>	<b>Column II</b>
(a) <i>Haemophilus influenzae</i>	(i) Cry protein
(b) <i>Bacillus thuringiensis</i>	(ii) DNA polymerase
(c) <i>Agrobacterium tumefaciens</i>	(iii) Cloning vector
(d) <i>Salmonella typhimurium</i>	(iv) Hind III
(e) <i>Thermus aquaticus</i>	(v) Construction of first rDNA molecules

(1) (a-iii), (b-iv), (c-i), (d-ii), (e-v)  
 (2) (a-iv), (b-i), (c-iii), (d-v), (e-ii)  
 (3) (a-ii), (b-i), (c-iv), (d-v), (e-ii)  
 (4) (a-i), (b-ii), (c-iii), (d-iv), (e-v)

102. Which of the following statement is correct regarding GMO ?  
 (1) It is fully resistant to all disease and insect infestations.  
 (2) It does not demand the use of chemical fertilisers at all.  
 (3) It improves the nutritional value of food.  
 (4) It results in decreased efficiency of mineral usage by plants.

103. **Statement I :** The nucleosomes in chromatin are seen as 'beads-on-string' structure when viewed under EM.  
**Statement II :** The beads-on-string structure in chromatin is packaged to form chromatin fibres that further gets coiled and condensed at anaphase stage of cell division.  
 Choose the correct option.  
 (1) Both **Statements** are correct.  
 (2) Both **Statements** are incorrect.  
 (3) **Statement I** is correct but **Statement II** is incorrect.  
 (4) **Statement I** is incorrect but **Statement II** is correct.

104. **Assertion (A) :** Meiosis is the reduction division that reduces chromosome number by half.  
**Reason (R) :** Meiosis increases the genetic variability in the population of organisms.  
 (1) Both **Assertion** and **Reason** are correct and **Reason** is correct explanation of **Assertion**.  
 (2) Both **Assertion** and **Reason** are correct but **Reason** is not correct explanation of **Assertion**.  
 (3) **Assertion** is correct but **Reason** is not correct.  
 (4) Both **Assertion** and **Reason** are not correct.

105. Monocot stem has :  
 (1) Sclerenchymatous hypodermis.  
 (2) Always no phloem parenchyma  
 (3) Vascular bundles arranged in a ring.  
 (4) Collenchymatous ground tissues.

106. For the AB-blood group system, the frequency of A and B alleles are 0.5 and 0.2 respectively. The expected frequency of AB-blood group bearing organism is likely to be :  
 (1) 42% (2) 20%  
 (3) 52% (4) 48%

107. Select the pathogen mismatched with the symptoms of disease caused by it from the list given below :

(1) <i>Wuchereria bancrofti</i>	— Chronic inflammation of lymphatic vessels of lower limb.
(2) <i>Haemophilus influenzae</i>	— Blockage of the intestinal passage.
(3) <i>Epidermophyton</i>	— Dry scaly lesions on nail.
(4) <i>Entamoeba histolytica</i>	— Constipation, abdominal pain.

108. Read the statement given below :

- A. MTP legalised in 1971.
- B. Saheli is non-steroidal oral contraceptive.
- C. Family planning programme initiated in 1951.
- D. Amniocentesis analysing fetal cells from amniotic fluid of the foetus.
- E. Interferons are proteins. In humans they are secreted by B-lymphocytes.

How many statements are not incorrect ?

- (1) Two (2) Three (3) Four (4) Five

109. At a particular locus, the frequency of allele 'A' is 0.45 and that of allele 'a' is 0.55. What would be the frequency of heterozygotes in a random mating population at equilibrium ?

- (1) 30.25% (2) 20.25% (3) 40.5% (4) 49.5%

110. Steroid hormones bind with \_\_\_\_\_ receptors and promotes \_\_\_\_\_ synthesis where protein hormones bind with \_\_\_\_\_ receptors.

- (1) intranuclear, protein, cell membrane.
- (2) cytoplasmic, carbohydrate, intranuclear.
- (3) intranuclear, protein, cytoplasmic.
- (4) cell membrane, carbohydrate, intracellular.

111. Which of the following statement is incorrect with respect to photorespiration ?

- (1) It occurs in daytime.
- (2) It is a characteristics of  $C_4$  plants.
- (3) It is a characteristics of  $C_3$  plants.
- (4) It occurs in chloroplast, peroxisome and mitochondria.

112. Match the Columns.

Column I	Column II
(a) Ripening of fruits	(i) ABA
(b) Stomatal closure	(ii) Cytokinins
(c) Bolting	(iii) Ethylene
(d) Weed-free lawns	(iv) 2, 4-D
(e) Adventitious shoot formation	(v) $GA_3$

- (1) (a-iii), (b-i), (c-v), (d-iv), (e-ii)

- (2) (a-i), (b-ii), (c-iii), (d-iv), (e-v)

- (3) (a-iv), (b-i), (c-ii), (d-iii), (e-v)

- (4) (a-iv), (b-i), (c-ii), (d-v), (e-iii)

113. (i) In majority of higher animals and plants growth and reproduction are mutually inclusive events.

(ii) *Solanum* genus has more than one species.

(iii) Lower the taxa, more the characteristics that the members within the taxon share.

(iv) As we go to higher from species to kingdom the number of common characteristics goes on increasing.

How many statements are incorrect ?

- (1) One (2) Two (3) Three (4) Four

114. **Statement I :** Reserve material in prokaryotic cells are stored in the cytoplasm in the form of inclusion bodies and lie free in cytoplasm because these are not bound any membrane.

**Statement II :** Mesosomes is formed by the extensions of plasma membrane into the cell and they increase the surface area of cell membrane.

- (1) Both **Statements** are correct.

- (2) Both **Statements** are incorrect.

- (3) **Statement I** is correct but **Statement II** is incorrect.

- (4) **Statement I** is incorrect but **Statement II** is correct.

115. Choose the incorrectly matched pair with respect to  $C_3$  and  $C_4$  plant.

Character	$C_3$	$C_4$
(1) Cell involved	Mesophyll	Mesophyll and Bundle sheath
(2) Primary $CO_2$ acceptor	PEP	RUBP
(3) Photorespiration	High	Negligible
(4) Productivity	Low	High

116. Cardiac activity could be moderated by the autonomous neural system. Tick the correct answer :

- (1) The sympathetic system decreases the heart rate but increase stroke volume.
- (2) The parasympathetic system stimulated heart rate and stroke volume
- (3) The parasympathetic system decreases the heart rate but increase the stroke volume.
- (4) The sympathetic system stimulated heart rate and stroke volume.

117. Choose the incorrect matched pair :

Column-A	Column-B
(1) Respiratory rhythm	Medulla
(2) Pneumotoxic centre	Pons
(3) Aortic body	Carotid artery
(4) Chemosensitive area	Adjacent to rhythm centre

118. Name the bacteria which cause following complications :

I. Lodged in small intestine

II. Higher fever 39° to 40°C

III. Stomach pains

IV. Constipation

V. Headache.

VI. Loss of appetite

(1) *Monascus purpureus*

(2) *Salmonella typhi*

(3) *Staphylococcus*

(4) *Streptococcus*

119. **Assertion (A)** : Smoking can raise blood pressure and increase heart rate.

**Reason (R)** : Nicotine stimulates adrenal glands to release adrenaline and nor-adrenaline into the blood circulation both of which raise blood pressure and increase heart rate.

(1) Both **Assertion** and **Reason** are correct and **Reason** is correct explanation of **Assertion**.

(2) Both **Assertion** and **Reason** are correct but **Reason** is not correct explanation of **Assertion**.

(3) **Assertion** is correct, but **Reason** is incorrect.

(4) Both **Assertion** and **Reason** are incorrect.

120. What is the importance of ovulation:

(i) to stimulate ovarian follicular development

(ii) to inhibit the process of ovulation

(iii) couple having difficulty in conception

(iv) to know the safe period for prevention of pregnancy

(1) (i) and (ii) (2) (ii) and (iii)

(3) (iii) and (i) (4) (iii) & (iv)

121. Choose the incorrect statement about Neanderthal man :

(1) Agriculture was started

(2) 1400 cc cranial capacity

(3) They lived near east and Central Asia

(4) They used hides to protect their body

122. Arrange following event of female reproductive cycle in (human) in sequence :

- (i) Ovulation.
- (ii) Sudden increase in level of LH.
- (iii) Growth of follicles.
- (iv) Secretion of FSH.
- (v) Formation of corpus luteum.

- (1) iv → iii → ii → i → v
- (2) iii → iv → ii → i → v
- (3) v → iv → ii → i → iii
- (4) v → ii → i → iii → iv

123. Match the Columns :

**Column I**

(a) ATP synthase

(b) Succinic dehydrogenase

(c) NADH dehydrogenase complex

(d) Cytochrome bc<sub>1</sub> complex

(1) (a-iv), (b-i), (c-ii), (d-iii)

(2) (a-ii), (b-iv), (c-i), (d-iii)

(3) (a-i), (b-ii), (c-iii), (d-iv)

(4) (a-iii), (b-i), (c-ii), (d-iv)

**Column II**

(i) Complex I

(ii) Complex V

(iii) Complex III

(iv) Complex II

124. **Assertion (A)** : The diploid egg cell is formed without reduction division and develops into embryo without fertilization.

**Reason (R)** : Grasses are the example of apomixis.

(1) Both **(A)** and **(R)** are correct and **(R)** is correct explanation of **(A)**.

(2) Both **(A)** and **(R)** are correct but **(R)** is not correct explanation of **(A)**.

(3) **(A)** is correct but **(R)** is incorrect.

(4) Both **(A)** and **(R)** are incorrect.

125. Which of the following statement is correct regarding bivalent ?

(1) Bivalent are dyad of cells.

(2) A bivalent means 2 chromatids and 2 centromere.

(3) Bivalents formations occurs in zygotene.

(4) All of the above.

126. **Statement I** : Identification and enumeration of plant and animal species of an ecosystem gives its species composition.

**Statement II** : Coevolved plant-pollinator mutualism can show co-extinctions.

Choose the correct option.

(1) Both **Statements** are correct.

(2) Both **Statements** are incorrect.

(3) **Statement I** is correct but **Statement II** is incorrect.

(4) **Statement I** is incorrect but **Statement II** is correct.

127. Hormones are defined as :

- Nutritive, non-antigenic & species specific
- Non-Nutritive, antigenic & non species specific
- Non-Nutritive, non-antigenic & non species specific
- Non-Nutritive, non-antigenic & species specific

128. Which of the following statements is/are correct?

- 20-25%  $\text{CO}_2$  is carried by haemoglobin as carbaminohaemoglobin
- Every 100 ml deoxygenated blood delivers approximately 4 ml of  $\text{CO}_2$  to the alveoli
- Minute quantities of carbonic anhydrase is present in plasma
- A high concentration of carbonic anhydrase is present in RBC.

- i, ii & iv
- i, iii & iv
- All except iii & iv
- i, ii, iii and iv

129. Find the correct match from the following :

Column-II	Column-II
(1) Sea weeds	500 mya
(2) First mammals	Monkey
(3) Coelacanth	First reptile
(4) Jawless fish	350 mya

130. What is the correct sequence of event during contraction of muscle ?

- Actin slides over myosin.
- Calcium released from sarcoplasmic reticulum.
- Binding of myosin head with actin.
- Cross bridge formation.
- Neurotransmitter released.

- $\text{I} \rightarrow \text{III} \rightarrow \text{IV} \rightarrow \text{II} \rightarrow \text{V}$
- $\text{II} \rightarrow \text{V} \rightarrow \text{IV} \rightarrow \text{III} \rightarrow \text{I}$
- $\text{V} \rightarrow \text{II} \rightarrow \text{III} \rightarrow \text{IV} \rightarrow \text{I}$
- $\text{V} \rightarrow \text{III} \rightarrow \text{II} \rightarrow \text{I} \rightarrow \text{IV}$

131. The neural system provides an organised network of (ii) connections for a (i) coordination.

Choose the correct option (ii), (i) to complete the given statement.

- (i) – Chemical, (ii) – Fast
- (i) – Fast, (ii) – Point to point
- (i) – Chemical, (ii) – Slow
- (i) – Point to point, (ii) – Chemical

132. Match the following columns and select the correct option.

Column I	Column II
(a) Action potential	(i) Synaptic cleft
(b) Chemical synapse	(ii) Excitable cells
(c) $\text{Na}^+ - \text{K}^+$ pump	(iii) Nerve impulse
(d) Neurons	(iv) Active pump
(1) (a-i), (b-iii), (c-iv), (d-ii)	
(2) (a-iii), (b-i), (c-iv), (d-ii)	
(3) (a-iii), (b-i), (c-ii), (d-iv)	
(4) (a-i), (b-iii), (c-ii), (d-iv)	

133. Regulation of sexual behaviour is joint activity of :

- Hypothalamus & Limbic system
- Thalamus & Pons
- Thalamus & Hypothalamus
- Hypothalamus & cerebral cortex

134. Find out the correct match.

Hormone	Secretory part
(1) FSH	— Leydig cells of testes.
(2) ANF	— Atrial wall of heart.
(3) Adrenaline	— Zona fasciculata layer of adrenal cortex.
(4) TCT	— Follicular cell of thyroid.

135. How many functions are related with pineal gland in the following ?

Menstrual cycle, Intelligent quotient, Defense capability, Pigmentation, Sleep wakeup cycle, Metabolism.

- Four
- Three
- Five
- Six

136. Select the mismatch pair.

- Capsid — Protein coat of viroids.
- Low molecular weight RNA — Viroid
- Abnormally folded protein — Prions
- Capsomeres — Sub unit of capsid

137. Match List I with List II.

List I	List II
A. Angina	I. Heart muscle is suddenly damaged.
B. Cardiac arrest	II. More common among the middle-aged and elderly.
C. Heart attack	III. Congestion of the lungs is one of the main symptoms.
D. Heart failure	IV. Heart stops beating.

Choose the correct answer from the options given below.

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

138. **Assertion(A):** The cells of testes have abundance of smooth endoplasmic reticulum.

**Reason(R):** The cells of testes secrete steroid/lipid hormones.

- (1) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
- (2) Both Assertion and Reason are correct but Reason is not correct explanation of Assertion.
- (3) Assertion is correct but Reason is incorrect.
- (4) Both Assertion and Reason are incorrect.

139. How many bones given in the box are unpaired?

Lacrimal, Parietal, Ethmoid, Occipital, Mandible, Nasal, Hyoid, Scapula, Collar bone, Pubis.

(1) 5	(2) 4
(3) 3	(4) 6

140. Mark the incorrect statement with respect to cytokinesis.

- (1) In animal cell appearance of furrow in the plasma membrane.
- (2) In plant cell appearance of a cell plate.
- (3) Both mitochondria and plastid get distributed between the daughter cells.
- (4) Cytokinesis is not followed by karyokinesis as a result of which syncytium.

141. Match the following column - I with column - II

Column - I		Column - II
A. NADP	i.	Zn
B. Carboxy peptidase	ii.	Haem
C. Pyruvate dehydrogenase	iii.	Potassium
D. Peroxidase	iv.	Niacin
	v.	Mg

- (1) A - iv, B - i, C - v, D - ii
- (2) A - iv, B - i, C - iii, D - ii
- (3) A - iii, B - ii, C - i, D - iv
- (4) A - iv, B - ii, C - iii, D - i

142. The hormones that attain a peak level in the middle of menstrual cycle is/are :

A. FSH	B. Thyroxine
C. Progesterone	D. LH

Choose the correct option :

- (1) A and D only
- (2) D only
- (3) A, B, C and D
- (4) A only

143. Read the following statements and choose the correct option regarding sickle-cell anaemia.

(A) Shape of RBC from biconcave disc to elongated sickle like structure.

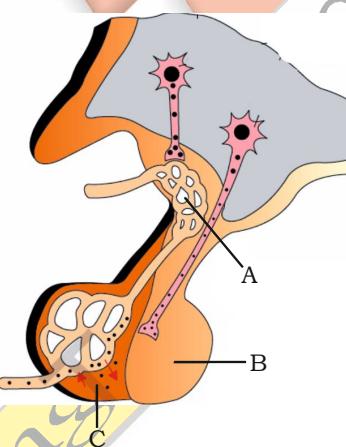
- (B) The disease is controlled by a single pair of allele.

- (C) This occur due to single base substitution at the sixth codon of the beta globin chain.

- (D) Homozygous individual for HbS (HbS HbS) show the disease phenotype.

(1) A and B	(2) C and D
(3) A, B, C and D	(4) All except D

144. In the following A, B and C labelling of pituitary given below. Which part stores and releases a hormone which can affect the kidney function by its constrictory effect on blood vessels ?



(1) B	(2) C
(3) Both A and B	(4) A

145. **Statement - I:** In respiratory ETS-energy of oxidation-reduction utilized for production of proton gradient.

**Statement - II:** In ETS of respiration oxidation of one carrier and reduction of another carrier is essential.

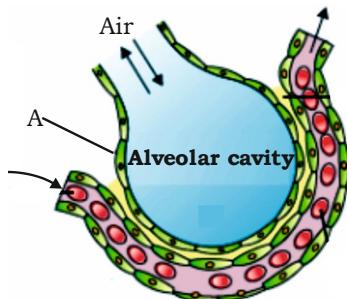
- (1) Both Statements (I) and (II) are correct.
- (2) Both Statements (I) and (II) are incorrect.
- (3) Only Statement (I) is correct.
- (4) Only Statement (II) is correct.

146. **Assertion(A):** Meiosis, per-se results in reduction of chromosome number by half.

**Reason(R):** Meiosis conserves specific chromosome number of each species across generations in sexually reproducing organism.

- (1) Both (A) and (R) are correct and (R) is correct explanation of (A).
- (2) Both (A) and (R) are correct but (R) is not correct explanation of (A).
- (3) (A) is correct but (R) is incorrect.
- (4) (R) is correct but (A) is incorrect.

147. Identify the labelling 'A' and the nature of the tissue connected with it.



Observe the figure and choose the correct option.

- (1) Red blood cell – Connective tissue.
- (2) Alveolar wall – Simple squamous epithelium.
- (3) Blood capillary – Endothelium.
- (4) Basement substance – Squamous epithelium.

148. Match List I with List II.

**List I**

A. Aquatic arthropods	I. Pulmonary respiration
B. Insects	II. Exchange $O_2$ with $CO_2$ by simple diffusion
C. Reptiles	III. Tracheal respiration
D. Flatworm	IV. Branchial respiration

Choose the correct answer from the options given below.

- (1) (A-III), (B-II), (C-I), (D-IV)
- (2) (A-IV), (B-III), (C-I), (D-II)
- (3) (A-IV), (B-III), (C-II), (D-I)
- (4) (A-I), (B-III), (C-IV), (D-II)

149. What is the role of transcription factor in gene expression?

- (1) Bind to RNA and enhance translation.
- (2) Bind to DNA and enhance transcription.
- (3) Bind to DNA and enhance replication.
- (4) Bind to RNA and prevent replication.

150. Insulin causes I and stimulates II. Fill in the blanks and choose the correct option given below.

- (1) I – Hyperglycemia, II – Glycogenolysis
- (2) I – Hypoglycemia, II – Glycogenesis
- (3) I – Hyperglycemia, II – Glycogenesis
- (4) I – Hypoglycemia, II – Gluconeogenesis

151. Match List – I with List – II.

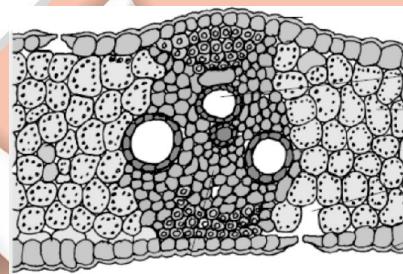
**List – I**

A. Palmitic acid	i. 2 – carbon atom
B. Arachidonic acid	ii. 16 – carbon atom
C. Glycerol	iii. 27 – carbon atom
D. Cholesterol	iv. 3 – carbon atom
E. Glycine	v. 20 – carbon atom

- (1) A – ii, B – iii, C – iv, D – v, E – i
- (2) A – iii, B – ii, C – iv, D – i, E – v
- (3) A – ii, B – v, C – iv, D – iii, E – i
- (4) A – iii, B – v, C – iv, D – ii, E – i

152. Introduction of fish like *Gambusia* in ponds and spraying of insecticides in swamps can result in decline in spread of all disease except :

- (1) Chikungunya
- (2) Malaria
- (3) Dengue
- (4) Pneumonia



153.

Select the incorrect option with respect to above diagram.

- (1) The stomata are present on both the surface of the epidermis.
- (2) Mesophyll is not differentiated into palisade and spongy parenchyma.
- (3) Similar sizes of vascular bundles (except in main vein)
- (4) The vein vary in thickness in the parallel venation of

154. Mark the incorrect match pair.

- (1) Adventitious roots → *Monstera*, *Banyan*
- (2) Pneumatophore → *Rhizophora*
- (3) Tap root → *Mustard* and *Sugarcane*
- (4) Stilt root → *Maize* and *Sugarcane*

155. Which of the following is correct sequence with respect to embryonic stages in humans ?

- (1) Cleavage → morula → gastrula → blastula → embryo
- (2) Morula → blastomeres → blastocyst → cleavage → embryo
- (3) Cleavage → morula → blastula → gastrula → embryo
- (4) Morula → blastocyst → blastomeres → cleavage

156. Which of the following classification system organism belonging to the same taxa have a common ancestor?

- (1) Natural system of classification
- (2) Artificial system of classification
- (3) Cytotaxonomy
- (4) Phylogenetic system of classification

157. Consider the following characteristics.

- Air bladder is present which regulates buoyancy.
- Sexes are separate.
- In males pelvic fins bear claspers.

Select the correct option for the above given characteristics.

- A and C are characteristics of Angel fish.
- B and C are characteristics of Sea horse.
- A and B are characteristics of *Clarias*.
- A and B are characteristics of Dog fish.

158. Kreb's cycle starts with condensation of (i) with (ii) and  $H_2O$  to yield citric acid. Select the correct option to fill in the blanks (i) and (ii).

- i - oxaloacetic acid, ii - acetyl group
- i - pyruvic acid, ii - malic acid
- i - oxaloacetic acid, ii - citric acid
- i - oxaloacetic acid, ii - pyruvic acid

159. Given below are two statements :

**Statement I :** Transmission of an impulse across chemical synapses is very similar to impulse conduction along a single axon.

**Statement II :** A nerve impulse is transmitted from one neuron to another through junction called neurotransmitters.

In the light of above statements, choose the correct answer from the options given below.

- Only **Statement I** is correct.
- Both **Statement I** and **Statement II** are correct.
- Only **Statement II** is correct.
- Both **Statement I** and **Statement II** are incorrect.

160. Mark the incorrect pair.

- $\oplus \text{♀} k_{2+2} C_4 A_{2+4} G_{(2)}$  - Cabbage, Radish, Cauliflower
- $Br \% \text{♂} P_2 A_3 G_1$  (or) 3 - Sugarcane, Maize, doob, grass, Wheat
- $Br \% \text{♀} k_{(5)} A_0 G_{(2)}$  - Marigold, Sunflower, Lettuce
- $Br/EBr \oplus \text{♂}$  - Cotton, Okra, Dahlia

161. Arrange the given steps of recombinant DNA technology in a proper sequence.

- Extraction of the desired product.
- Construction of a recombinant DNA molecule.

C. Multiplication of r-DNA into the host cell.

D. Introduction of r-DNA into the host cell.

Choose the correct sequence.

- $C \rightarrow A \rightarrow D \rightarrow E$
- $B \rightarrow D \rightarrow C \rightarrow A$
- $B \rightarrow A \rightarrow C \rightarrow D$
- $A \rightarrow B \rightarrow D \rightarrow C$

162. Which of the following statement is incorrect ?

- Comparative anatomy and morphology shows similarities and differences among organisms of today and those that existed years ago.
- Sweet potato (root modification) and potato (stem modification) is an example of analogy.
- The first non-cellular forms of life could have originated 3 billion years back.
- Jawless fish probably evolved around 320 mya.

163. Given below are two statements – one is labelled as Assertion (A) and other as Reason (R).

**Assertion (A) :** Different varieties of cheese are known by their characteristic texture, flavour and taste, the specificity coming from the microbes used.

**Reason (R) :** Large holes in 'Swiss cheese' are due to production of a large amount of  $CO_2$  by a fungi named *Propionibacterium sharmani*.

In the light of above statements, choose the correct answer from the options given below.

- (A) is true but (R) is false.
- Both (A) and (R) are true but (R) is not the correct explanation of (A).
- Both (A) and (R) are false.
- Both (A) and (R) are true and (R) is the correct explanation of (A).

164. How many of the following statement is/are not incorrect ?

- In reptiles, the left atrium receives oxygenated blood from the lungs.
- Ventricular systole increases the ventricular pressure causing the closure of semilunar valves.
- During a cardiac cycle, each ventricle pumps out approximately 70 mL of blood which is called the beat volume.
- Adrenal medullary hormones decrease the cardiac output.

- 2
- 3
- 1
- 4

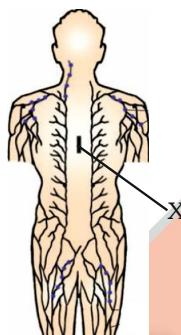
165. Some of the salient observations drawn from human genome project are as follows:

- Less than 2% of genome codes for proteins.
- SNPs pronounced as 'snips'
- Chromosome Y has the fewest (231) genes.
- Largest known human gene being dystrophin at 2.4 million bases.
- Human genome contains 3164.7 bp.

Choose the correct option:

- All except B
- All except E
- A, B, C and E
- All of these

166. Choose the correct option with respect to identification and function of labelled structure 'X' in the diagrammatic representation of lymphatic system of human body given below.



(1) Spleen	— Large reservoir of erythrocytes.
(2) Tonsils	— Located near the heart and beneath the breast bone.
(3) Thymus	— Development and maturation of T-lymphocytes.
(4) Lymph nodes	— Trapped antigens and cause the immune response.

167. Given below are two statements.

**Statement I :** The separated DNA fragments can be visualised only after staining the DNA with ethidium bromide exposed to gamma radiation.

**Statement II :** Plasmids and bacteriophages have the ability to replicate within bacterial cells independent of the control of chromosomal DNA.

In the light of above statements, choose the correct answer from the options given below.

- Only **Statement II** is incorrect.
- Both **Statement I** and **Statement II** are correct.
- Only **Statement I** is incorrect.
- Both **Statement I** and **Statement II** are incorrect.

168. The excretory system of *Rana tigrina* consists of:

- Kidneys, urethra, cloaca and urinary bladder.
- Cloaca, ureters, urethra and urinary bladder.
- Ureters, cloaca, kidneys and urinary bladder.
- Urethra, cloaca and urinary bladder only.

169. Match List – I with List – II

List – I		List – II	
A. Repetitive DNA	i.	1.4 million location where single base DNA difference.	
B. Polymorphism	ii.	Coding sequence of RNA expressed.	
C. SNPs	iii.	U.S. Department of energy.	
D. HGP	iv.	Arises due to mutation.	
E. Express sequence tags	v.	Radio active DNA as a probe.	
	vi.	Identify difference in some specific region in DNA sequence.	

- A – ii, B – i, C – iv, D – vi, E – v
- A – vi, B – iv, C – i, D – iii, E – ii
- A – iv, B – i, C – vi, D – v, E – iii
- A – ii, B – iv, C – iii, D – i, E – v

170. Select the mismatch pair.

**Excretory structures Organisms**

(1) Nephridia	Earthworms
(2) Green glands	Prawns
(3) Flame cells	<i>Planaria</i>
(4) Protonephridia	Roundworm

171. **Statement – I:** The process of splicing represents the dominance of RNA world.

**Statement – II:** The split gene arrangement represents probably the ancient feature of genome.

- Both statements (I) and (II) are correct.
- Both statements (I) and (II) are incorrect.
- Only statement (I) is correct.
- Only statement (II) is correct.

172. How many of the following are broadly utilitarian services of the ecosystem?

Fibre, Firewood, Lubricants, Resins, Cereals, Oxygen, Pollination

- Three
- Two
- Four
- Five

173. Which of the following hormone induces ovulation of graafian follicles and maintains the corpus luteum, formed from the remnants of the graffian follicles after ovulation ?

- Thyroid stimulating hormone
- Follicle stimulating hormone
- Luteinizing hormone
- Progesterone

174. The capacity to generate a whole plant from any cell/explant and method of producing thousands of plants through tissue culture is called respectively :

- Somatic hybrids and Totipotency.
- Totipotency and Micro-propagation.
- Micro-propagation and Totipotency.
- Totipotency and Somatic hybridisation.

175. The function of all the following is to maintain the ionic balance and pH of the body fluids by selective secretion of hydrogen ions except.

- Distal convoluted tubule
- Descending limb of loop of Henle
- Collecting duct
- Proximal convoluted tubule

176. Which of the following statement are incorrect?

- Collagen act as intercellular ground substance.
- Antibody acts as fight infectious agents.
- GLUT-4 enables glucose transport into cells.
- Trypsin act as intercellular messengers.

177. Consider the following tropic level.

- Tree → Birds → Parasites
- Tree → Insect → Insect eating bird
- Grasses → Cow → Lion
- Phytoplankton → Zooplankton → Small fish → Large fish
- Deteritus → Detritivores → Worm eating bird

How many tropic level represent upright pyramid of number in a GFC?

- Two
- Three
- Four
- One

178. Biopiracy is the term used to refer to the use of bio-resources by multinational companies and other organisation :

- with proper authorisation from the countries and people concerned without compensatory payment.
- without proper authorisation from the countries and people concerned without compensatory payment.
- got patent rights through US patent and trademark office.
- Both '2' and '3'

179. The process of mineralisation by microorganisms help in the release of

- organic nutrient from humus.
- inorganic nutrient from humus.
- inorganic nutrients from detritus and formation of humus.
- both organic and inorganic nutrient from detritus.

180. Which among the following is not a common function of stem in majority of Angiosperms ?

- Spreading out branches bearing leaves, flower and fruit.
- It conduct water, minerals and photosynthesis.
- Absorption of water and minerals.
- To store food, support, protection and of vegetative propagation.

## VERY SIMILAR QUESTION PAPER-2 ( NEET 2026 ) ANSWER KEY

01. (3).	21. (1).	41. (1).	61. (1).	81. (1).	101. (2).	121. (1).	141. (1).	161. (2).
02. (2).	22. (3).	42. (2).	62. (2).	82. (2).	102. (3).	122. (1).	142. (1).	162. (4).
03. (1).	23. (1).	43. (3).	63. (4).	83. (4).	103. (3).	123. (2).	143. (3).	163. (1).
04. (3).	24. (3).	44. (4).	64. (1).	84. (1).	104. (2).	124. (2).	144. (1).	164. (1).
05. (4).	25. (1).	45. (1).	65. (4).	85. (3).	105. (1).	125. (3).	145. (1).	165. (2).
06. (1).	26. (2).	46. (3).	66. (1).	86. (1).	106. (2).	126. (1).	146. (2).	166. (3).
07. (2).	27. (4).	47. (4).	67. (1).	87. (2).	107. (2).	127. (4).	147. (2).	167. (3).
08. (4).	28. (1).	48. (2).	68. (3).	88. (1).	108. (3).	128. (4).	148. (2).	168. (3).
09. (4).	29. (2).	49. (4).	69. (3).	89. (1).	109. (4).	129. (4).	149. (2).	169. (2).
10. (2).	30. (3).	50. (4).	70. (1).	90. (4).	110. (1).	130. (3).	150. (2).	170. (4).
11. (1).	31. (2).	51. (4).	71. (2).	91. (2).	111. (2).	131. (2).	151. (3).	171. (1).
12. (1).	32. (1).	52. (4).	72. (1).	92. (3).	112. (1).	132. (2).	152. (4).	172. (2).
13. (2).	33. (4).	53. (1).	73. (2).	93. (2).	113. (2).	133. (1).	153. (4).	173. (3).
14. (3).	34. (2).	54. (3).	74. (2).	94. (3).	114. (1).	134. (2).	154. (3).	174. (2).
15. (4).	35. (1).	55. (2).	75. (3).	95. (2).	115. (2).	135. (3).	155. (3).	175. (2).
16. (4).	36. (4).	56. (1).	76. (2).	96. (3).	116. (4).	136. (1).	156. (4).	176. (4).
17. (4).	37. (1).	57. (2).	77. (3).	97. (3).	117. (3).	137. (2).	157. (3).	177. (1).
18. (3).	38. (4).	58. (2).	78. (3).	98. (4).	118. (2).	138. (1).	158. (1).	178. (2).
19. (1).	39. (3).	59. (2).	79. (2).	99. (2).	119. (1).	139. (2).	159. (4).	179. (2).
20. (2).	40. (3).	60. (2).	80. (4).	100. (1).	120. (4).	140. (4).	160. (4).	180. (3).

