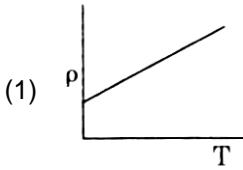
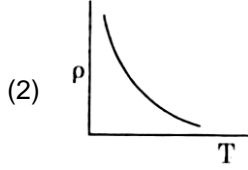
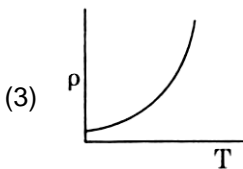
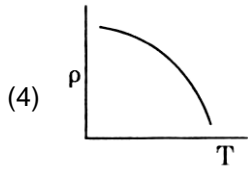
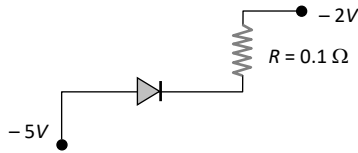


1. In a region, the potential is represented by  $V(x, y, z) = 6x - 8xy - 8y + 6yz$ , where  $V$  is in volts and  $x, y, z$  are in meters. The electric force experienced by a charge of 2 coulomb situated at point (1, 1, 1) is:
- (1)  $6\sqrt{5}$  N                      (2) 30 N  
(3) 24 N                              (4)  $4\sqrt{35}$  N
2. **Statement-I:** The temperature coefficient of resistance is positive for metals and negative for *P-type* semiconductor.  
**Statement-II:** The effective charge carriers in metals are negatively charged whereas in *P-type* semiconductor they are positively charged.
- (1) Statement I is incorrect but statement II is correct  
(2) Both Statements I and II are correct  
(3) Both Statements I and II are incorrect  
(4) Statement I is correct but statement II is incorrect
3. A bullet is fired from a gun with a speed of 1000 m/s in order to hit a target 100 m away. At what height above the target should the gun be aimed? (The resistance of air is negligible and  $g=10$  m/s<sup>2</sup>)
- (1) 5 cm  
(2) 10 cm  
(3) 15 cm  
(4) 20 cm
4. A charge  $Q$  is enclosed by a Gaussian spherical surface of radius  $R$ . If the radius is doubled, then the outward electric flux will –
- (1) Be reduced to half  
(2) Remain the same  
(3) Be doubled  
(4) Increase four times
5. A charge  $q$  moves in a region where electric field  $\vec{E}$  and magnetic field  $\vec{B}$  both exist, then the force on it is
- (1)  $q(\vec{v} \times \vec{B})$   
(2)  $q\vec{E} + q(\vec{v} \times \vec{B})$   
(3)  $q\vec{B} + q(\vec{B} \times \vec{v})$   
(4)  $q\vec{B} + q(\vec{E} \times \vec{v})$
6. Which of the following graph represents the variation resistivity ( $\rho$ ) with temperature ( $T$ ) for copper?
- (1)  (2)   
(3)  (4) 
7. A geostationary satellite is orbiting the earth at a height of  $5R$  above that surface of the earth,  $R$  being the radius of the earth. The time period of another satellite in hours at a height of  $2R$  from the surface of the earth is –
- (1) 5                                      (2) 10  
(3)  $6\sqrt{2}$                               (4)  $6/\sqrt{2}$
8. The stress-strain curves are drawn for two different materials X and Y. It is observed that the ultimate strength point and the fracture point are close to each other for material X but are far apart for material Y.
- We can say that materials X and Y are likely to be (respectively),
- (1) Plastic and ductile (2) Ductile and brittle  
(3) Brittle and ductile (4) Brittle and plastic
9. Two spheres of masses  $m$  and  $M$  are situated in air and the gravitational force between them is  $F$ . The space around the masses is now filled with a liquid of specific gravity 3. The gravitational force will now be
- (1)  $\frac{F}{3}$                                       (2)  $\frac{F}{9}$   
(3)  $3F$                                       (4)  $F$
10. A charge moving with velocity  $v$  in X-direction is subjected to a field of magnetic induction in negative X-direction. As a result, the charge will
- (1) Remain unaffected  
(2) Start moving in a circular Y-Z plane  
(3) Retard along X-axis  
(4) Move along a helical path around X axis

11. **Assertion (A)** : In the following circuit the potential drop across the resistance is zero.



**Reason (R)** : The given resistance has low value.

- (1) (A) is false but (R) is true  
 (2) Both (A) and (R) are true and (R) is the correct explanation of (A)  
 (3) Both (A) and (R) are true but (R) is not the correct explanation of (A)  
 (4) (A) is true but (R) is false.
12. A series LCR circuit is connected to an ac voltage source. When L is removed from the circuit, the phase difference between current and voltage is  $\frac{\pi}{3}$ . If instead C is removed from the circuit, the

phase difference is again  $\frac{\pi}{3}$  between current and

voltage. The power factor of the circuit is :

- (1) zero (2) 0.5  
 (3) 1.0 (4) -1.0
13. The magnetic potential energy stored in a certain inductor is 25 mJ, when the current in the inductor is 60 mA. This inductor is of inductance
- (1) 0.138 H  
 (2) 1.389 H  
 (3) 13.88 H  
 (4) 13.89 H

14. A 100  $\Omega$  resistance and a capacitor of 100  $\Omega$  reactance are connected in series across a 220 V source. When the capacitor is 50% charged, the peak value of the current is

- (1) 11 A (2) 4.4 A  
 (3) 11  $\sqrt{2}$  A (4) 2.2 A

15. Ray optics is valid, when characteristic dimensions are

- (1) Of the same order as the wavelength of light  
 (2) Much smaller than the wavelength of light  
 (3) Of the order of one millimetre  
 (4) Much larger than the wavelength of light

16. A light beam is incident on a denser medium whose refractive index is 1.414 at an angle of incidence  $45^\circ$ . Find the ratio of width of refracted beam in a medium to the width of the incident beam in air.

- (1)  $\sqrt{3} : \sqrt{2}$  (2)  $1 : \sqrt{2}$   
 (3)  $\sqrt{2} : 1$  (4)  $\sqrt{2} : \sqrt{3}$

17. Electromagnetic radiation of frequency  $f$ , velocity  $v$  and wavelength  $\lambda$ , in air, enters a glass slab of refractive index  $\mu$ . The frequency, wavelength and velocity of light in the glass slab will be, respectively

- (1)  $\frac{f}{\mu}, \frac{\lambda}{\mu}, v$  (2)  $f, \lambda, \frac{v}{\mu}$   
 (3)  $f, \frac{\lambda}{\mu}, \frac{v}{\mu}$  (4)  $\frac{f}{\mu}, \frac{\lambda}{\mu}, \frac{v}{\mu}$

18. Two thin lenses are of same focal length ( $f$ ), but one is convex and the other is concave. When they are placed in contact with each other, the equivalent focal length of the combination will be

- (1)  $f/4$  (2)  $f/2$   
 (3) Infinite (4) Zero

19. The number of photoelectrons emitted for light of a frequency  $\nu$  (higher than the threshold frequency  $\nu_0$ ) is proportional to

- (1)  $\nu - \nu_0$   
 (2) Threshold frequency ( $\nu_0$ )  
 (3) Intensity of light  
 (4) Frequency of light ( $\nu$ )

20. The nuclei  ${}_6\text{C}^{13}$  and  ${}_7\text{N}^{14}$  can be described as

- (1) Isotones  
 (2) Isobars  
 (3) Isotopes of carbon  
 (4) Isotopes of nitrogen

21. If the velocity of a particle is  $v = At + Bt^2$ , where A and B are constants, then the distance travelled by it between 1s and 2s is:

- (1)  $\frac{3}{2}A + AB$  (2)  $3A + 7B$   
 (3)  $\frac{3}{2}A + \frac{7}{3}B$  (4)  $\frac{A}{2} + \frac{B}{3}$

22. The velocity of charge carries of current (about 1 A) in a metal under normal conditions is of the order of

- (1) A fraction of mm/s
- (2) Velocity of light
- (3) Several thousand m/s
- (4) A few hundred m/s

23. A solid sphere of radius R is placed on a smooth horizontal surface. A horizontal force F is applied at height h from the lowest point. For the maximum acceleration of the centre of mass

- (1)  $h = R$
- (2)  $h = 2R$
- (3)  $h = 0$
- (4) the acceleration will be same whatever h may be

24. If a soap bubble expands, the pressure inside the bubble:

- (1) Increases
- (2) remains the same
- (3) is equal to the atmospheric pressure
- (4) decreases

25. An ideal gas is compressed to half its initial volume by means of several processes. Which of the process results in the maximum work done on the gas?

- (1) Adiabatic
- (2) Isobaric
- (3) Isochoric
- (4) Isothermal

26. The gases carbon-monoxide (CO) and nitrogen at the same temperature have kinetic energies  $E_1$  and  $E_2$  respectively. Then

- (1)  $E_1 = E_2$
- (2)  $E_1 > E_2$
- (3)  $E_1 < E_2$
- (4)  $E_1$  and  $E_2$  cannot be compared

27. The displacement of a particle executing simple harmonic motion is given by

$$y = A_0 + A \sin \omega t + B \cos \omega t$$

Then the amplitude of its oscillation is given by:

- (1)  $\sqrt{A^2 + B^2}$
- (2)  $\sqrt{A_0^2(A + B^2)}$
- (3)  $A + B$
- (4)  $A_0 + \sqrt{A^2 + B^2}$

28. A transverse wave propagating along x-axis is represented by

$$Y(x, t) = 8.0 \sin\left(0.5\pi x - 4\pi t - \frac{\pi}{4}\right)$$

Where x is in metre and t is in second. The speed of the wave is

- (1)  $4\pi$  m/s
- (2)  $0.5\pi$  m/s
- (3)  $\frac{\pi}{4}$  m/s
- (4) 8 m/s

29. A pair of physical quantities having same dimensional formula is

- (1) Force and torque
- (2) Work and energy
- (3) Force and impulse
- (4) Linear momentum and angular momentum

30. Match the columns

Column-I		Column-II	
(i)	Radius of orbit is related with atomic number (Z)	(a)	Is proportional to Z
(ii)	Current associated due to orbital motion of electron with atomic number (Z)	(b)	Is inversely proportion to Z
(iii)	Magnetic field at the center due to orbital motion of electron related with Z	(c)	Is proportional to $Z^2$
(iv)	Velocity of an electron related with atomic number (Z)	(d)	Is proportional to $Z^3$

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

31. The venturi – meter works on:

- (1) Bernoulli's principle
- (2) The principle of parallel axes
- (3) The principle of perpendicular axes
- (4) Huygen's principle

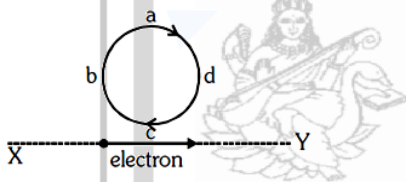
32. A particle of mass  $m$  and charge  $q$  is placed at rest in a uniform electric field  $E$  and then released. The kinetic energy attained by the particle after moving a distance  $y$  is

- (1)  $q E y^2$                       (2)  $q E^2 y$   
 (3)  $q E y$                       (4)  $q^2 E y$

33. The electric resistance of a certain wire of iron is  $R$ . If its length and radius are both doubled, then

- (1) The resistance will be doubled and the specific resistance will be halved  
 (2) The resistance will be halved and the specific resistance will remain unchanged  
 (3) The resistance will be halved and the specific resistance will be doubled  
 (4) The resistance and the specific resistance, will both remain unchanged

34. An electron moves on a straight line path  $XY$  as shown. The  $abcd$  is a coil adjacent to the path of electron. What will be the direction of current, if any, induced in the coil?



- (1)  $adcb$   
 (2) The current will reverse its direction as the electron goes past the coil  
 (3) No current induced  
 (4)  $abcd$

35. The magnetic force acting on a charged particle of charge  $-2 \mu\text{C}$  in a magnetic field of  $2\text{T}$  acting in  $Y$  direction, when the particle velocity is  $(2\hat{i} + 3\hat{j}) \times 10^6 \text{ ms}^{-1}$  is

- (1)  $8 \text{ N}$  in  $-z$  direction    (2)  $4 \text{ N}$  in  $z$  direction  
 (3)  $8 \text{ N}$  in  $y$  direction    (4)  $8 \text{ N}$  in  $x$  direction

36. The work done in turning a magnet of magnetic moment  $M$  by an angle of  $90^\circ$  from the meridian, is  $n$  times the corresponding work done to turn it through an angle of  $60^\circ$ . The value of  $n$  is given by

- (1)  $2$                               (2)  $1$   
 (3)  $0.5$                           (4)  $0.25$

37. A circular coil of radius  $10 \text{ cm}$ ,  $500$  turns and resistance  $2 \Omega$  is placed with its plane, perpendicular to the horizontal component of the earth's magnetic field. It is rotated about its vertical diameter through  $180^\circ$  in  $0.25 \text{ s}$ . The induced e.m.f. in the coil is –

(Take  $H_E = 3.0 \times 10^{-5} \text{ T}$ )

- (1)  $6.6 \times 10^{-4} \text{ V}$               (2)  $1.4 \times 10^{-2} \text{ V}$   
 (3)  $2.6 \times 10^{-2} \text{ V}$               (4)  $3.8 \times 10^{-3} \text{ V}$

38. One face of a rectangular glass plate  $6 \text{ cm}$  thick is silvered. An object held  $8 \text{ cm}$  in front of the first face, forms an image  $12 \text{ cm}$  behind the silvered face. The refractive index of the glass is

- (1)  $0.4$                               (2)  $0.8$   
 (3)  $1.2$                               (4)  $1.6$

39. In Young's double slit experiment, the slits are  $2 \text{ mm}$  apart and are illuminated by photons of two wavelengths  $\lambda_1 = 12000 \text{ \AA}$  and  $\lambda_2 = 10000 \text{ \AA}$ . At what minimum distance from the common central bright fringe on the screen  $2 \text{ m}$  from the slit will a bright fringe from one interference pattern coincide with a bright fringe from the other?

- (1)  $8 \text{ mm}$                           (2)  $6 \text{ mm}$   
 (3)  $4 \text{ mm}$                           (4)  $3 \text{ mm}$

40. A linear aperture of width  $0.02 \text{ cm}$  is placed immediately in front of a lens of focal length  $60 \text{ cm}$ . The aperture is illuminated normally by a parallel beam of wavelength  $5 \times 10^{-8} \text{ cm}$ . The distance of the first dark band of the diffraction pattern from the centre of the screen is

- (1)  $0.25 \text{ cm}$                       (2)  $0.20 \text{ cm}$   
 (3)  $0.15 \text{ cm}$                       (4)  $0.10 \text{ cm}$

41. The wavelength of the first line of Lyman series for hydrogen atom is equal to that of the second line of Balmer series for a hydrogen like ion. The atomic number  $Z$  of hydrogen like ion is –

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

42. A car covers the first-half of the distance between two places at  $40 \text{ km/h}$  and other half at  $60 \text{ km/h}$ . The average speed of the car is

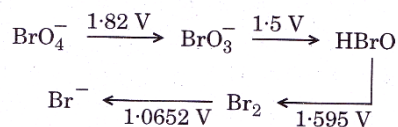
- (1)  $40 \text{ km/h}$                       (2)  $48 \text{ km/h}$   
 (3)  $50 \text{ km/h}$                       (4)  $60 \text{ km/h}$

43. A body, under the action of a force  $\vec{F} = 6\hat{i} - 8\hat{j} + 10\hat{k}$ , acquires an acceleration of  $1 \text{ ms}^{-2}$ . The mass of this body must be
- (1)  $2\sqrt{10} \text{ kg}$                       (2)  $10 \text{ kg}$   
(3)  $20 \text{ kg}$                           (4)  $10\sqrt{2} \text{ kg}$
44. A position dependent force  $F = (7 - 2x + 3x^2) \text{ N}$  acts on a small body of mass  $2 \text{ kg}$  and displaces it from  $x = 0$  to  $x = 5 \text{ m}$ . Work done in joule is
- (1) 35                                      (2) 70  
(3) 135                                    (4) 270
45. The barrier potential of a p-n junction depends on
- (a) Type of semi-conductor material  
(b) Amount of doping  
(c) Temperature
- Which one of the following is correct?
- (1) (a) and (b) only  
(2) (b) only  
(3) (b) and (c) only  
(4) (a), (b) and (c)

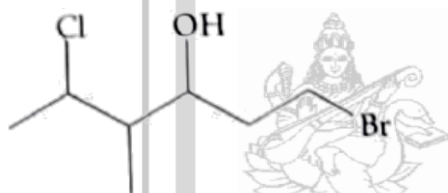


46. If radius of second Bohr orbit of the  $\text{He}^+$  ion is 105.8 pm, what is the radius of third Bohr orbit of  $\text{Li}^{2+}$  ion?  
 (1) 15.87 pm (2) 1.587 pm  
 (3) 158.7 Å (4) 158.7 pm
47. **Assertion (A):** lead storage battery is a galvanic cell without salt bridge.  
**Reason (R):** a secondary cell is rechargeable cell.  
 (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
48. The number of significant figures for the three numbers 161 cm, 0.161 cm, 0.0161 cm are  
 (1) 3, 4 and 5 respectively  
 (2) 3, 4 and 4 respectively  
 (3) 3, 3 and 4 respectively  
 (4) 3, 3 and 3 respectively
49. In which of the following pairs of molecules/ions, the central atoms have  $sp^2$  hybridization?  
 (1)  $\text{NO}_2^-$  and  $\text{NH}_3$  (2)  $\text{BF}_3$  and  $\text{NO}_2^-$   
 (3)  $\text{NH}_2^-$  and  $\text{H}_2\text{O}$  (4)  $\text{BF}_3$  and  $\text{NH}_2^-$
50. Oxidation numbers of P in  $\text{PO}_4^{3-}$ , of S in  $\text{SO}_4^{2-}$  and that of Cr in  $\text{Cr}_2\text{O}_7^{2-}$  are respectively.  
 (1) +3, +6 and +5 (2) +5, +3 and +6  
 (3) -3, +6 and +6 (4) +5, +6 and +6
51. In which of the following the bond angle is maximum?  
 (1)  $\text{NH}_3$  (2)  $\text{SCl}_2$   
 (3)  $\text{NH}_4^+$  (4)  $\text{H}_2\text{O}$
52. **Assertion (A):** Isotonic solutions must have the same molar concentration.  
**Reason (R):** solutions which have the same osmotic pressure are known as isotonic solution.  
 (1) Both (A) and (R) are true and (R) is the correct explanation of (1)  
 (2) Both (A) and (R) are true and (R) is not the correct explanation of (A)
53. Considered the following statements.  
 (a) A reagent that brings an electron pair to the reactive site is called a nucleophile.  
 (b) Carbonyl carbon in  $\text{CH}_3\text{CHO}$  is an electrophilic centre.  
 (c)  $(\text{CH}_3)_3\text{N}$ : acts as a nucleophile.  
 The correct statements are:  
 (1) (a) and (b) only  
 (2) (b) and (c) only  
 (3) (a), (b) and (c)  
 (4) (a) and (c) only
54. For a cyclic process, which of the following is not true?  
 (1)  $\Delta H = 0$  (2)  $\Delta E = 0$   
 (3)  $\Delta G = 0$  (4) Total  $W = 0$
55. For the reversible reaction:  
 $\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightleftharpoons 2 \text{NH}_3(\text{g}) + \text{heat}$   
 The equilibrium shifts in forward direction:  
 (1) By increasing the concentration of  $\text{NH}_3(\text{g})$   
 (2) By decreasing the pressure  
 (3) By decreasing the concentrations of  $\text{N}_2(\text{g})$  and  $\text{H}_2(\text{g})$   
 (4) By increasing pressure and decreasing temperature
56. Match the compounds given in List – I with their characteristic reactions given in List – II. Select the correct option.
- | List – I (Compounds)   | List – II (Reactions)  |
|--|--|
| A. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2$ | 1. Alkaline hydrolysis                                       |
| B. $\text{CH}_3\text{C} \equiv \text{CH}$                    | 2. With KOH (alcohol) and $\text{CHCl}_3$ produces bad smell |
| C. $\text{CH}_3\text{CH}_2\text{COOCH}_3$                    | 3. Gives white ppt. with ammonical $\text{AgNO}_3$           |
| D. $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$              | 4. With Lucas reagent cloudiness appears after 5 minutes     |
- (1) A:4, B:2, C:3, D:1  
 (2) A:2, B:1, C:4, D:3  
 (3) A:3, B:2, C:1, D:4  
 (4) A:2, B:3, C:1, D:4

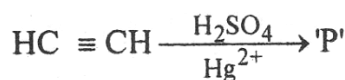
57. Consider the change in oxidation state of Bromine corresponding to different emf values as shown in the diagram below: Then the species undergoing disproportionation is



- (1)  $\text{BrO}_3^-$  (2)  $\text{Br}_2$   
 (3)  $\text{BrO}_4^-$  (4)  $\text{HBrO}$
58. An example of a double salt is  
 (1) Bleaching powder (2)  $K_4[\text{Fe}(\text{CN})_6]$   
 (3) Hypo (4) Potash Alum
59. Which of the following are not state functions?  
 (I)  $q + w$  (II)  $q$   
 (III)  $w$  (IV)  $H - TS$   
 (1) (I) and (IV) (2) (II), (III) and (IV)  
 (3) (I), (II) and (III) (4) (II) and (III)
60. The correct IUPAC name of the following compound is :



- (1) 6-bromo-2-chloro-4-methylhexan-4-ol  
 (2) 1-bromo-4-methyl-5-chlorohexan-3-ol  
 (3) 6-bromo-4-methyl-2-chlorohexan-1-ol  
 (4) 1-bromo-5-chloro-4-methylhexan-3-ol
61. The incorrect statement regarding chirality is :  
 (1) The product obtained by  $\text{S}_{\text{N}}2$  reaction of haloalkane having chirality at the reactive site shows inversion of configuration.  
 (2) Enantiomers are superimposable mirror images on each other.  
 (3) A racemic mixture shows zero optical rotation.  
 (4)  $\text{S}_{\text{N}}1$  reaction yields 1: 1 mixture of both enantiomers.
62. In the following reaction:



Product 'P' will not give

- (1) Iodoform test  
 (2) Tollen's reagent test

- (3) Fehling reagent test  
 (4) Victor Meyer test
63. The correct option for the value of vapour pressure of a solution at  $45^\circ\text{C}$  with benzene to octane in molar ratio 3 : 2 is:  
 [At  $45^\circ\text{C}$  vapour pressure of benzene is 280 mm Hg and that of octane is 420 mm Hg. Assume Ideal gas]  
 (1) 350 mm of Hg (2) 160 mm of Hg  
 (3) 168 mm of Hg (4) 336 mm of Hg
64. Match List -1 with List - II.

	List - I (Products formed)		List - II (Reaction of carbonyl compound with)
(a)	Cyanohydrin	(i)	$\text{NH}_2\text{OH}$
(b)	Acetal	(ii)	$\text{RNH}_2$
(c)	Schiff's base	(iii)	alcohol
(d)	Oxime	(iv)	$\text{HCN}$

Choose the correct answer from the options given below :

- (1) (a) – (ii), (b) – (iii), (c) – (iv), (d) – (i)  
 (2) (a) – (i), (b) – (iii), (c) – (ii), (d) – (iv)  
 (3) (a) – (iv), (b) – (iii), (c) – (ii), (d) – (i)  
 (4) (a) – (iii), (b) – (iv), (c) – (ii), (d) – (i)
65. The pressure of  $\text{H}_2$  required to make the potential of  $\text{H}_2$ -electrode zero in pure water at 298 K is:  
 (1)  $10^{-14}$  atm (2)  $10^{-12}$  atm  
 (3)  $10^{-10}$  atm (4)  $10^{-4}$  atm
66. The conductivity of centimolar solution of KCl at  $25^\circ\text{C}$  is  $0.0210 \text{ ohm}^{-1} \text{ cm}^{-1}$  and the resistance of the cell containing the solution at  $25^\circ\text{C}$  is 60 ohm. The value of cell constant is –  
 (1)  $3.28 \text{ cm}^{-1}$  (2)  $1.26 \text{ cm}^{-1}$   
 (3)  $3.34 \text{ cm}^{-1}$  (4)  $1.34 \text{ cm}^{-1}$

67. For the chemical reaction  
 $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$   
 The correct option is

- (1)  $-\frac{d[\text{N}_2]}{dt} = 2 \frac{d[\text{NH}_3]}{dt}$   
 (2)  $-\frac{d[\text{N}_2]}{dt} = \frac{1}{2} \frac{d[\text{NH}_3]}{dt}$   
 (3)  $3 \frac{d[\text{H}_2]}{dt} = 2 \frac{d[\text{NH}_3]}{dt}$   
 (4)  $-\frac{1}{3} \frac{d[\text{H}_2]}{dt} = -\frac{1}{2} \frac{d[\text{NH}_3]}{dt}$

68. The unit of rate constant for a zero order reaction is
- (1)  $\text{mol L}^{-1} \text{s}^{-1}$
  - (2)  $\text{L mol}^{-1} \text{s}^{-1}$
  - (3)  $\text{L}^2 \text{mol}^{-2} \text{s}^{-1}$
  - (4)  $\text{s}^{-1}$
69. By passing  $\text{H}_2\text{S}$  gas in acidified  $\text{KMnO}_4$  solution, we get
- (1) S
  - (2)  $\text{K}_2\text{S}$
  - (3)  $\text{MnO}_2$
  - (4)  $\text{K}_2\text{SO}_3$
70. Magnetic moment 2.84 B.M. is given by:  
(At. Nos. Ni = 28, Ti = 22, Cr = 24, Co = 27)
- (1)  $\text{Ni}^{2+}$
  - (2)  $\text{Ti}^{3+}$
  - (3)  $\text{Cr}^{2+}$
  - (4)  $\text{Co}^{2+}$
71. **Assertion:** Cross Aldol condensation of ethanal and Propanal gives a mixture of four products.  
**Reason:** Ethanal and Propanal, both contain  $\alpha$ -hydrogen.
- (1) Both (A) and (R) are true and (R) is the correct explanation of (1)
  - (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
72. Ethylene diamine tetraacetate (EDTA) ion is:
- (1) Tridentate ligand with three "N" donor atoms
  - (2) Hexadentate ligand with four "O" and two "N" donor atom
  - (3) Unidentate ligand
  - (4) Bidentate ligand with two "N" donor atoms
73. The reaction :  $\text{ArN}_2\text{Cl} \xrightarrow{\text{Cu/HCl}} \text{ArCl} + \text{N}_2$  is known as :
- (1) Balz Schiemann reaction
  - (2) Sandmeyer's reaction
  - (3) Finkelstein reaction
  - (4) Gattermann reaction
74. Consider the following reaction,
- $$\text{Phenol} \xrightarrow{\text{Zn dust}} \text{X} \xrightarrow[\text{Anhydrous AlCl}_3]{\text{CH}_3\text{Cl}} \text{Y}$$
- $$\xrightarrow{\text{Alkaline KMnO}_4} \text{Z}$$
- The product Z is
- (1) Benzaldehyde
  - (2) Benzoic acid
  - (3) Benzene
  - (4) Toluene
75. If degree of ionization ( $\alpha$ ) of a weak electrolyte AB is very less then  $\alpha$  is :
- (a) Directly proportional to the square root of volume of solution
  - (b) Inversely proportional to the dilution
  - (c) Inversely proportional to the square root of concentration
  - (d) Directly proportional to concentration
- The correct statements are
- (1) (a) and (d)
  - (2) (a) and (c)
  - (3) (b) and (c)
  - (4) (c) and (d)
76. In the reaction
- $$\text{CH}_3 - \overset{\text{CH}_3}{\underset{|}{\text{CH}}} - \text{CH}_2 - \text{O} - \text{CH}_2 - \text{CH}_3 + \text{HI} \xrightarrow{\text{Heated}}$$
- (1)  $\text{CH}_3 - \overset{\text{CH}_3}{\underset{|}{\text{CH}}} - \text{CH}_3 + \text{CH}_3\text{CH}_2\text{OH}$
  - (2)  $\text{CH}_3 - \overset{\text{CH}_3}{\underset{|}{\text{CH}}} - \text{CH}_2\text{OH} + \text{CH}_3\text{CH}_3$
  - (3)  $\text{CH}_3 - \overset{\text{CH}_3}{\underset{|}{\text{CH}}} - \text{CH}_2\text{OH} + \text{CH}_3 - \text{CH}_2 - \text{I}$
  - (4)  $\text{CH}_3 - \overset{\text{CH}_3}{\underset{|}{\text{CH}}} - \text{CH}_2 - \text{I} + \text{CH}_3\text{CH}_2\text{OH}$
77. The reagent (s) which can be used to distinguish acetophenone from benzophenone is (are)
- (1) 2, 4 – Dinitrophenylhydrazine
  - (2) Aqueous solution of  $\text{NaHSO}_3$
  - (3)  $\text{I}_2$  and  $\text{NaOH}$
  - (4) None of above
78. **Statement – I:** Maltose is composed of two  $\alpha$  – D – glucose units.  
**Statements – II:** Maltose is a non – reducing sugar.
- (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 I is incorrect but statement II is correct

79. For an ideal solution, the **correct** option is:

- (1)  $\Delta_{mix} V \neq 0$  at constant T and P
- (2)  $\Delta_{mix} H = 0$  at constant T and P
- (3)  $\Delta_{mix} G = 0$  at constant T and P
- (4)  $\Delta_{mix} S = 0$  at constant T and P

80. **Assertion (A):** The standard free energy changes of all spontaneously occurring reactions are negative.

**Reason (R):** The standard free energies of the elements in their standard states at 1 bar and 298 K are taken as zero.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (1)
- (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

81. Equilibrium constant value depends on

- (a) Temperature
- (b) Concentration of reactants and products
- (c) Catalyst

The correct option(s) is/are

- (1) a only
- (2) a and b only
- (3) b and c only
- (4) a, b and c

82. An element, X has the following isotopic composition:

$^{200}\text{X} : 90\%$ ,  $^{199}\text{X} : 8.0\%$ ,  $^{202}\text{X} : 2.0\%$ ,

The weighted average atomic mass of the naturally occurring element X is closet to

- (1) 201 amu
- (2) 202 amu
- (3) 199 amu
- (4) 200 amu

83. Match the Xenon compounds in **Column – I** with its structure in **Column – II** and assign the correct code:

Column – I	Column – II
a. $\text{XeF}_4$	i. Pyramidal
b. $\text{XeF}_6$	ii. Square planar
c. $\text{XeOF}_4$	iii. Distorted octahedral
d. $\text{XeO}_3$	iv. Square pyramidal

	a	b	c	d
(1)	(ii)	(iii)	(iv)	(i)
(2)	(ii)	(iii)	(i)	(iv)
(3)	(iii)	(iv)	(i)	(ii)
(4)	(i)	(ii)	(iii)	(iv)

84.  $3\text{O}_2(\text{g}) \rightleftharpoons 2\text{O}_3(\text{g})$

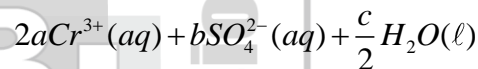
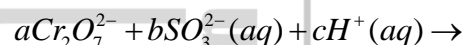
for the above reaction at 298 K,  $K_c$  is found to be  $3.0 \times 10^{-59}$ . If the concentration of  $\text{O}_2$  at equilibrium is 0.040 M then concentration of  $\text{O}_3$  in M is

- (1)  $1.9 \times 10^{-63}$
- (2)  $2.4 \times 10^{31}$
- (3)  $1.2 \times 10^{21}$
- (4)  $4.38 \times 10^{-32}$

85. The  $\text{p}K_b$  of dimethylamine and  $\text{p}K_a$  of acetic acid are 3.27 and 4.77 respectively at T(K). The correct option for the pH of dimethylammonium acetate solution is:

- (1) 6.25
- (2) 8.50
- (3) 5.50
- (4) 7.75

86. On balancing the given redox reaction,



the coefficients a, b and c are found to be, respectively –

- (1) 3, 8, 1
- (2) 1, 8, 3
- (3) 8, 1, 3
- (4) 1, 3, 8

87. In electrolyte concentration cell:

- (a) The electrode material and the solution in both half cells are composed of the same substances
- (b) Only the concentrations of solution of the same substances is different
- (c)  $E^{\circ}_{cell} = 0$
- (d) The Nernst equation reduces to

$$E_{cell} = -\left(\frac{0.0591}{n}\right) \log Q \text{ at } 25^{\circ}\text{C}$$

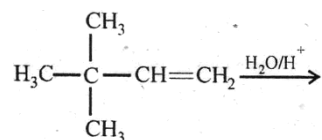
The correct statements are

- (1) (a) and (b) only
- (2) (b) and (c) only
- (3) (a), (b) and (c)
- (4) (a), (b), (c) and (d)

88. Which of the following reactions is the metal displacement reaction? Choose the right option

- (1)  $2\text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{PbO} + 4\text{NO}_2 + \text{O}_2 \uparrow$   
 (2)  $2\text{KClO}_3 \xrightarrow{\Delta} 2\text{KCl} + 3\text{O}_2$   
 (3)  $\text{Cr}_2\text{O}_3 + 2\text{Al} \xrightarrow{\Delta} \text{Al}_2\text{O}_3 + 2\text{Cr}$   
 (4)  $\text{Fe} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2 \uparrow$

89. In the following reaction:



A Minor Product + B Minor Product

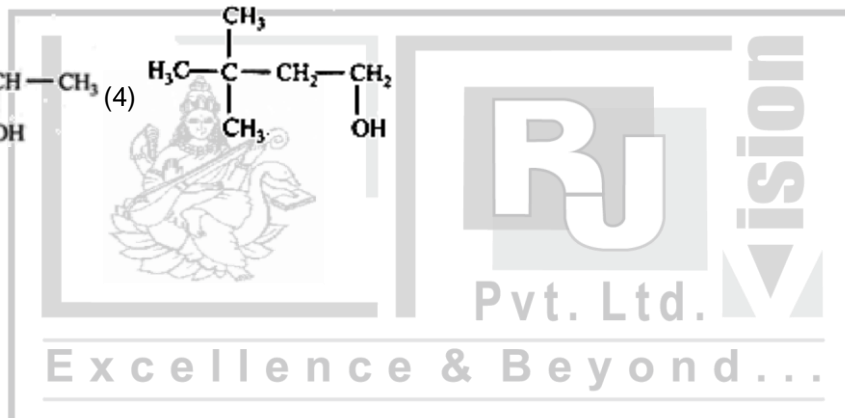
The major product is:

- (1)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{CH}-\text{CH}_3 \\ | \quad | \\ \text{OH} \quad \text{CH}_3 \end{array}$  (2)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2-\text{C}-\text{CH}_2-\text{CH}_3 \\ | \quad | \\ \text{OH} \quad \text{CH}_3 \end{array}$   
 (3)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{CH}-\text{CH}_3 \\ | \quad | \\ \text{CH}_3 \quad \text{OH} \end{array}$  (4)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{CH}_2-\text{CH}_2 \\ | \quad | \\ \text{CH}_3 \quad \text{OH} \end{array}$

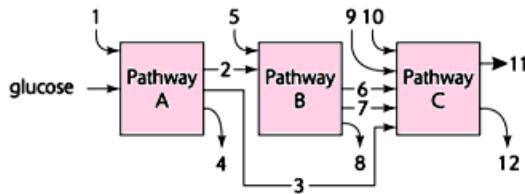
90. Statement – I: An orbital cannot have more than two electrons and they must have opposite spins.

Statements – II: No two electrons in an atom can have same set of all the four quantum numbers as per Pauli's exclusion principle.

- (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 I is incorrect but statement II is correct



91. The three boxes in this diagram represent the three major biosynthetic pathways in aerobic respiration. Arrows represent net reactions or products.



Arrows numbered 4, 8 and 12 can all be:

- (1) NADH  
 (2) ATP  
 (3) H<sub>2</sub>O  
 (4) FAD<sup>+</sup> or FADH<sub>2</sub>
92. In the taxonomic categories which hierarchal arrangement in ascending order is correct in case of animals?
- (1) Kingdom, Class, Phylum, Family, Order, Genus, Species.  
 (2) Kingdom, Order, Class, Phylum, Family, Genus, Species  
 (3) Kingdom, Order, Phylum, Class, Family, Genus, Species.  
 (4) Kingdom, Phylum, Class, Order, Family, Genus, Species.
93. Choose the wrong statement:
- (1) Neurospora is used in the study of biochemical genetics  
 (2) Morels and truffles are poisonous mushrooms  
 (3) Yeast is unicellular and useful in fermentation  
 (4) Penicillium is multicellular and produces antibiotics
94. Ground tissue includes:
- (1) All tissues except epidermis and vascular bundles  
 (2) Epidermis and cortex  
 (3) All tissues internal to endodermis  
 (4) All tissues external to endodermis
95. In bryophytes and pteridophytes, transport of male gametes requires:
- (1) Wind  
 (2) Insects  
 (3) Birds  
 (4) Water

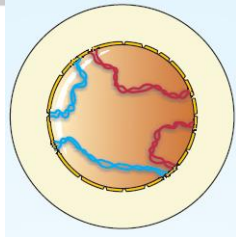
96. Read the following give statements (A to E) and select the option with all correct statements:
- (A) Mosses and Lichens are the first organisms to colonise a bare rock.  
 (B) Selaginella a homosporous pteridophyte.  
 (C) Coralloid roots in *Cycus* have VAM.  
 (D) Main plant body in bryophytes is gametophyte where as in pteridophytes it is sporophytic.  
 (E) In gymnosperms male and female gametophytes are present within sporangia located on sporophyte.
- (1) (A), (C) and (D) (2) (B), (C) and (D)  
 (3) (A), (D) and (E) (4) (B), (C) and (E)
97. Select the correct option: (A: Direction RNA synthesis, B: Direction of reading of the template DNA strand)

A

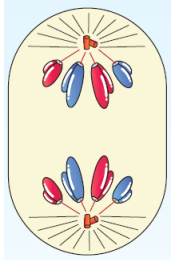
B

- (1) 5' ----- 3'                      3' ----- 5'  
 (2) 3' ----- 5'                      5' ----- 3'  
 (3) 5' ----- 3'                      5' ----- 3'  
 (4) 3' ----- 5'                      3' ----- 5'

98. Which of the following immunoglobulins does constitute the largest percentage in human milk?
- (1) Ig M                      (2) Ig A  
 (3) Ig G                      (4) Ig D
99. Which of the following characteristics is mainly responsible for diversification of insects on land?
- (1) Exoskeleton . . . (2) Eyes  
 (3) Segmentation                      (4) Bilateral symmetry
100. Leaves become modified into spines in
- (1) Onion                      (2) Silk cotton  
 (3) Opuntia                      (4) pea.
101. Radial symmetry is found in the flowers of
- (1) *Trifolium*                      (2) *Pisum*  
 (3) *Cassia*                      (4) *Brassica*
102. Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because
- (1) There is a negative intrapleural pressure pulling the lung walls  
 (2) There is a positive intrapleural pressure  
 (3) Pressure in the lungs is higher than the atmospheric pressure  
 (4) There is a negative pressure in the lungs

- 103.** Match the following genera with their respective phylum.
- |              |       |                 |
|--------------|-------|-----------------|
| (A) Ophiura  | (i)   | Mollusca        |
| (B) Physalia | (ii)  | Platyhelminthes |
| (C) Pinctada | (iii) | Echinodermata   |
| (D) Planaria | (iv)  | Coelenterata    |
- (1) (A)-(iv), (B)-(i), (C)-(iii), (D) – (ii)  
 (2) (A)-(iii), (B)-(iv), (C)-(i), (D)-(ii)  
 (3) (A)-(i), (B)-(iii), (C)-(ii), (D)-(i)  
 (4) (A)-(iii), (B)-(iv), (C)-(ii), (D)-(i)
- 104.** Cortex is the region found between
- (1) Epidermis and stele  
 (2) pericycle and endodermis  
 (3) Endodermis and pith  
 (4) Endodermis and vascular bundle.
- 105.** Choose the correctly matched pair:
- (1) Tendon – Specialized connective tissue  
 (2) Adipose tissue – Dense connective tissue  
 (3) Areolar tissue – Loose connective tissue  
 (4) Cartilage – Loose connective tissue
- 106.** Tegmialia in cockroach, arises from :
- (1) Mesothorax  
 (2) Metathorax  
 (3) Prothorax and Mesothorax  
 (4) Prothorax
- 107.** Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen?
- (1) Pseudomonas      (2) Mycoplasma  
 (3) Nostoc              (4) Bacillus
- 108.** Which of the following are correctly matched with respect to their taxonomic classification?
- (1) Flying fish, cattle fish, silverfish - Pisces  
 (2) Centipede, millipede, spider, scorpion - Insecta  
 (3) House fly, butterfly, tsetse fly, silverfish - Insecta  
 (4) Spiny anteater, sea urchin, sea cucumber – Echinodermata
- 109.** Chromatophores take part in
- (1) Movement              (2) Respiration  
 (3) photosynthesis      (4) Growth
- 110.** Which one of the following is not an inclusion body found in prokaryotes?
- (1) Phosphate granule  
 (2) Cyanophycean granule  
 (3) Glycogen granule  
 (4) Polysome
- 111.** Match the following and select the correct answer:
- |                 |                                  |
|-----------------|----------------------------------|
| (A) Centriole   | (1) Infoldings in mitochondria   |
| (B) Chlorophyll | (2) Thylakoids                   |
| (C) Cristae     | (3) Nucleic acids                |
| (D) Ribozymes   | (4) Basal body cilia or flagella |
- (1) A : 4, B : 2, C : 1, D : 3  
 (2) A : 1, B : 2, C : 4, D : 3  
 (3) A : 1, B : 3, C : 2, D : 4  
 (4) A : 4, B : 3, C : 1, D : 2
- 112.** Secondary metabolites such as nicotine, strychnine and caffeine are produced by plants for their:
- (1) Nutritive value      (2) Growth response  
 (3) Defence action      (4) Effect on reproduction
- 113.** The **correct** sequence of phases of cell cycle is:
- (1)  $G_1 \rightarrow G_2 \rightarrow S \rightarrow M$   
 (2)  $S \rightarrow G_1 \rightarrow G_2 \rightarrow M$   
 (3)  $G_1 \rightarrow S \rightarrow G_2 \rightarrow M$   
 (4)  $M \rightarrow G_1 \rightarrow G_2 \rightarrow S$
- 114.** Which stages of cell division do the following figures A and B represent respectively?
- 

**A**

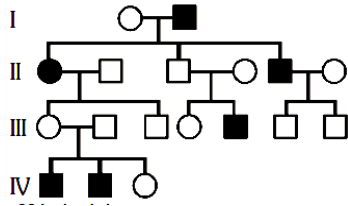


**B**
- (1) Metaphase              - Telophase  
 (2) Telophase              - Metaphase  
 (3) Late anaphase          - Prophase  
 (4) Prophase                - Anaphase
- 115.** During seed germination its stored food is mobilized by:
- (1) Ethylene                (2) Cytokinin  
 (3) ABA                      (4) Gibberellin

116. Which one of the following characteristics is common both in humans and adult frogs?  
 (1) Internal fertilization  
 (2) Nucleated RBCs  
 (3) Ureotelic mode of excretion  
 (4) Four – chambered heart
117. A plant in your garden avoids photorespiratory losses, has improved water use efficiency shows high rates of photosynthesis at high temperatures and has improved efficiency of nitrogen utilization. In which of the following physiological groups would you assign this plant?  
 (1) C<sub>3</sub> (2) C<sub>4</sub>  
 (3) CAM (4) Nitrogen
118. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by:  
 (1) Hexokinase  
 (2) Enolase  
 (3) Phosphofructokinase  
 (4) Aldolase
119. Auxin can be bioassayed by:  
 (1) Hydroponics  
 (2) Potometer  
 (3) Lettuce hypocotyl elongation  
 (4) Avena coleoptile curvature
120. Which of the following biomolecules does have a phosphodiester bond?  
 (1) Monosaccharides in a polysaccharide  
 (2) Amino acids in a polypeptide  
 (3) Nucleic acids in a nucleotide  
 (4) Fatty acids in a diglycerides
121. Which one is the most abundant protein in the animal world?  
 (1) Trypsin  
 (2) Haemoglobin  
 (3) Collagen  
 (4) Insulin
122. Vital capacity of lung is \_\_\_\_\_ .  
 (1) IRV + ERV + TV + RV  
 (2) IRV + ERV + TV - RV  
 (3) IRV + ERV + TV  
 (4) IRV + ERV
123. Which one of the following is correct?  
 (1) Plasma = Blood – Lymphocytes  
 (2) Serum = Blood + Fibrinogen  
 (3) Lymph = Plasma + RBC + WBC  
 (4) Blood = Plasma + RBC + WBC + Platelets
124. Compared to blood our lymph has  
 (1) Plasma without proteins  
 (2) More WBCs and no RBCs  
 (3) More RBCs and less WBCs  
 (4) No plasma
125. Which one of the following animals has two separate circulatory pathways?  
 (1) Lizard (2) Whale  
 (3) Shark (4) Frog
126. The correct floral formula of chilli is:  
 (1)  $\oplus \overset{\curvearrowright}{\text{K}}_{(5)} \overset{\curvearrowright}{\text{C}}_{(5)} \text{A}_5 \text{G}_{(2)}$   
 (2)  $\oplus \overset{\curvearrowright}{\text{K}}_{(5)} \text{C}_{(5)} \text{A}_{(5)} \text{G}_2$   
 (3)  $\oplus \overset{\curvearrowright}{\text{K}}_5 \overset{\curvearrowright}{\text{C}}_5 \text{A}_{(5)} \text{G}_2$   
 (4)  $\oplus \overset{\curvearrowright}{\text{K}}_{(5)} \text{C}_5 \text{A}_5 \text{G}_{(2)}$
127. The part of nephron involved in active reabsorption of sodium is  
 (1) Proximal convoluted tubule  
 (2) Bowman's capsule  
 (3) Descending limb of Henle's loop  
 (4) Distal convoluted tubule
128. Stimulation of a muscle fibre by a motor neuron occurs at:  
 (1) The neuromuscular junction  
 (2) The transverse tubules  
 (3) The myofibril  
 (4) The sarcoplasmic reticulum
129. Select the correct matching of the type of the joint with the example in human skeletal system:
- |     | Type of joint       | Example                                     |
|-----|---------------------|---|
| (1) | Cartilaginous joint | Between frontal and parietal                |
| (2) | Pivot joint         | Between third and fourth cervical vertebrae |
| (3) | Hinge joint         | Between humerus and pectoral girdle         |
| (4) | Gliding joint       | Between carpals                             |

130. The functional unit of contractile system in striated muscle is  
 (1) Myofibril (2) Sarcomere  
 (3) Z-band (4) Cross bridges
131. The Nissl's granules of nerves cell are made up of  
 (1) DNA  
 (2) RNA  
 (3) ribosome  
 (4) protein
132. Which of the following regions of the brain is incorrectly paired with its function?  
 (1) Medulla oblongata – homeostatic control  
 (2) Cerebellum – language comprehension  
 (3) Corpus callosum – communication between the left and right cerebral cortices  
 (4) Cerebrum – calculation and contemplation
133. Which one of the following hormones is not involved in sugar metabolism?  
 (1) Aldosterone (2) Insulin  
 (3) Glucagon (4) Cortisone
134. Which hormones do stimulate the production of pancreatic juice and bicarbonate?  
 (1) Gastrin and insulin  
 (2) Cholecystikinin and secretin  
 (3) Insulin and glucagon  
 (4) Angiotensin and epinephrine
135. Which of the following is hormone releasing IUD?  
 (1) Multiload 375 (2) Lippes loop  
 (3) Cu7 (4) LNG-20
136. What is common between vegetative reproduction and apomixes?  
 (1) Both are applicable to only dicot plants  
 (2) Both bypass the flowering phase  
 (3) Both occur round the year  
 (4) Both produce progeny identical to the parent
137. In angiosperms, microsporogoneis and megasporogoneis:  
 (1) From gametes without further divisions  
 (2) Involve meiosis  
 (3) Occur in ovule  
 (4) Occur in anther
138. Which one of the following fruits is parthenocarpic?  
 (1) Apple (2) Jackfruit  
 (3) Banana (4) Brinjal
139. The shared terminal duct of the reproductive and urinary system in the human male is  
 (1) urethra  
 (2) ureter  
 (3) Vas deferens  
 (4) vasa efferentia.
140. Male hormone is produced in the testis by cells of  
 (1) Sertoli  
 (2) epithelial  
 (3) Spermatoocytes  
 (4) Leydig.
141. Brush border is characteristic of  
 (1) Neck of nephron  
 (2) Collecting tube  
 (3) Proximal convoluted tubule  
 (4) All the above
142. Which of the following is not a sexually transmitted disease?  
 (1) Syphilis  
 (2) Acquired Immuno Deficiency Syndrome disease (AIDS)  
 (3) Trichomoniasis  
 (4) Encephalitis
143. How many pairs by contrasting characters in pea plants was studied by Mendel in his experiments?  
 (1) Five (2) Six  
 (3) Eight (4) Seven
144. A man with blood group 'A' marries a woman with blood group 'B'. Which are all the possible blood groups of their offsprings?  
 (1) A and B only (2) A, B and AB only  
 (3) A, B, AB and O (4) O only
145. **Assertion (A):** Mendel's law of Independent assortment does not hold good for the genes that are located closely on the same chromosome.  
**Reason (R):** Closely located genes assort independently:  
 (1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)  
 (2) (A) is correct but (R) is not correct  
 (3) (A) is not correct but (R) is correct  
 (4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

146. In the following human pedigree, the filled symbols represent the affected individual. Identify the type of given pedigree.



- (1) X-linked recessive  
 (2) Autosomal recessive  
 (3) X-linked dominant  
 (4) Autosomal dominant
147. Identify the correct order of organization of genetic material from largest to smallest:
- (1) Genome, chromosome, nucleotide, gene  
 (2) Genome, chromosome, gene, nucleotide  
 (3) Chromosome, genome, nucleotide, gene  
 (4) Chromosome, gene, genome, nucleotide
148. Taylor conducted the experiments to prove semi conservative mode of chromosome replication on
- (1) *Vicia faba*  
 (2) *Drosophila melanogaster*  
 (3) *E. coli*  
 (4) *Vinca rosea*
149. Industrial melanism is an example of:
- (1) Natural selection (2) Mutation  
 (3) Neo Lamarckism (4) Neo Darwinism
150. A population will not exist in Hardy-Weinberg equilibrium if:
- (1) Individuals mate selectively  
 (2) There are no mutations  
 (3) There is no migration  
 (4) The population is large
151. Thorn of Bougainvillea and tendril of Cucurbita are examples of
- (1) Vestigial organs  
 (2) Retrogressive evolution  
 (3) Analogous organs  
 (4) Homologous organs
152. In which disease does mosquito transmitted pathogen cause chronic inflammation of lymphatic vessels?
- (1) Elephantiasis (2) Ringworm disease  
 (3) Ascariasis (4) Amoebiasis

153. Transplantation of tissues/organs fails often due to non – acceptance by the patient's body. Which type of immune – responsible for such rejections?

- (1) Cell – mediated immune response  
 (2) Hormonal immune response  
 (3) Physiological immune response  
 (4) Autoimmune response

154. Which is the particular type of drug that is obtained from the plant whose one flowering branch is shown below?



- (1) Hallucinogen (2) Depressant  
 (3) Stimulant (4) Pain-killer

155. Which of the following is wrongly matched in the given option?

[A: Microbe, B: Product, C: Application]

- (1) A: *Trichoderma polysporum*, B: Cyclosporin A, C: Immunosuppressive drug  
 (2) A: *Monascus purpureus*, B: Statins, C: Lowering of blood cholesterol  
 (3) A: *Streptococcus*, B: Streptokinase, C: Removal of clot from blood vessel  
 (4) A: *Clostridium butylicum*, B: Lipase, C: Removal of oil stains

156. High value of BOD (Biochemical Oxygen Demand) indicates that:

- (1) Water is pure  
 (2) Water is highly polluted  
 (3) Water is less polluted  
 (4) Consumption of organic matter in the water is higher by the microbes

157. The introduction of t-DNA into plants involves:

- (1) Altering the pH of soil, then heat-socking the plants  
 (2) Exposing the plants to cold for a brief period  
 (3) Allowing the plant roots to stand in water  
 (4) Infection of the plant by *Agrobacterium tumefaciens*

158. The DNA molecule to which the gene of interest is integrated for cloning is called  
 (1) Template (2) carrier  
 (3) Transformer (4) vector
159. Which of the following is not a component of downstream processing?  
 (1) Purification (2) Preservation  
 (3) Expression (4) Separation
160. In Bt cotton the Bt toxin present in plant tissue as pro-toxin is converted into active toxin due to  
 (1) Alkaline pH of the insect gut  
 (2) Acidic pH of the insect gut  
 (3) Action of gut micro-organisms  
 (4) Presence of conversion factors in insect gut
161. The first human hormone produced by recombinant DNA technology is  
 (1) Insulin (2) Estrogen  
 (3) Thyroxin (4) Progesterone
162. An association of individuals of different species living in the same habitat and having functional interactions is:  
 (1) Biotic community (2) Ecosystem  
 (3) Population (4) Ecological niche
163. When does the growth rate of a population following the logistic model equal zero? The logistic model is given as  $dN/dt = rN(1-N/K)$  :  
 (1) When  $N/K$  is exactly one  
 (2) When  $N$  nears the carrying capacity of the habitat  
 (3) When  $N/K$  equals zero  
 (4) When death rate is greater than birth rate
164. Given below are two statements:  
**Statement I:** Decomposition is a process in which the detritus is degraded into simpler substances by microbes.  
**Statement II:** Decomposition is faster if the detritus is rich in lignin and chitin.  
 (1) Both Statement I and Statement II are incorrect  
 (2) Statement I is correct but Statement II is incorrect  
 (3) Statement I is incorrect but Statement II is correct  
 (4) Both Statement I and Statement II are correct
165. Vertical distribution of different species occupying different levels in a biotic community is known as:  
 (1) Divergence (2) Stratification  
 (3) Zonation (4) Pyramid
166. The upright pyramid of number is absent in:  
 (1) Pond (2) Forest  
 (3) Lake (4) Grassland
167. In which of the following animals, digestive tract has additional chambers like crop and gizzard?  
 (1) *Bufo*, *Balaenoptera*, *Bangarus*  
 (2) *Catla*, *Columba*, *Crocodilus*  
 (3) *Pavo*, *Psittacula*, *Corvus*  
 (4) *Corvus*, *Columba*, *Chameleon*
168. The species confined to a particular region and not found elsewhere is termed as:  
 (1) Alien (2) Endemic  
 (3) Rare (4) Keystone
169. Double fertilization is  
 (1) Fusion of two male gametes of a pollen tube with two different eggs  
 (2) Fusion of two male gametes with one egg  
 (3) Fusion of one male gamete with two polar nuclei  
 (4) Syngamy and triple fusion
170. Which of the following layers in an antral follicle is acellular?  
 (1) Theca interna (2) Stroma  
 (3) Zona pellucida (4) Granulosa
171. A childless couple can be assisted to have a child through a technique called GIFT. The full form of this technique is:  
 (1) Gamete intra fallopian transfer  
 (2) Gamete internal fertilization and transfer  
 (3) Germ cell internal fallopian transfer  
 (4) Gamete inseminated fallopian transfer
172. The movement of a gene from one linkage group to another is called:  
 (1) Inversion (2) Duplication  
 (3) Translocation (4) Crossing over
173. Which one of the following is the starter codon?  
 (1) AUG (2) UGA  
 (3) UAA (4) UAG

174. Match List I with List II:

List I		List II	
A.	$\alpha$ -1 antitrypsin	I.	Cotton bollworm
B.	Cry IAb	II.	ADA deficiency
C.	Cry IAc	III.	Emphysema
D.	Enzyme replacement therapy	IV.	Corn borer

Choose the correct answer from the options given below:

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

175. A common biocontrol agent for the control of plant diseases is

- (1) Baculovirus
- (2) Bacillus thuringiensis
- (3) Glomus
- (4) Trichoderma

176. Which of the following is not correctly matched for the organism and its cell wall degrading enzyme?

- (1) Bacteria – Lysozyme
- (2) Plant cells – Cellulase
- (3) Algae – Methylase
- (4) Fungi – Chitinase

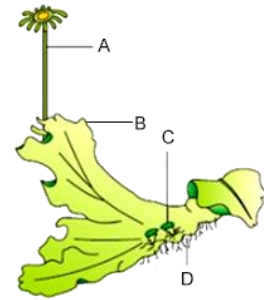
177. Maximum number of existing transgenic animals is of.

- (1) Mice
- (2) Cow
- (3) Pig
- (4) Fish

178. The mass of living material at a trophic level at a particular time is called

- (1) Gross primary productivity
- (2) Standing state
- (3) Net primary productivity
- (4) Standing crop

179. Examine the figure given below and select the correct option giving all the four parts (A, B, C and D) rightly identified.



- (1) A: Archegoniophore, B: Female thallus, C: Gemma cup, D: Rhizoids
- (2) A: Archegoniophore, B: Female thallus, C: Bud, D: Food
- (3) A: Seta, B: Sporophyte, C: Protonema, D: Rhizoids
- (4) A: Antheridiophore, B: Male thallus, C: Globule, D: Roots

180. The chromosomes in which centromere is situated close to one end are

- (1) Metacentric
- (2) Acrocentric
- (3) Telocentric
- (4) Sub-metacentric

## Syllabus

### FT – 13

Day & Date	:	15 June, 2026
Time	:	2: 00 PM to 5: 00 PM
Physics	:	FULL COURSE
Chemistry	:	FULL COURSE
Biology	:	FULL COURSE

