

Roll No.:

Test Date: 13-07-2022



Aakash
+ BYJU'S



for

Medical Entrance Exam - 2022

National Eligibility-cum-Entrance Test (NEET)

OPEN MOCK TEST No.

(XII Studying/XII Passed Students)

INSTRUCTIONS FOR CANDIDATES

1. Read each question carefully.
2. It is mandatory to use Blue/Black Ball Point Pen to darken the appropriate circle in the answer sheet.
3. Mark should be dark and should completely fill the circle.
4. Rough work must not be done on the answer sheet.
5. Do not use white-fluid or any other rubbing material on answer sheet. No change in the answer once marked is allowed.
6. Student cannot use log tables and calculators or any other material in the examination hall.
7. Before attempting the question paper, student should ensure that the test paper contains all pages and no page is missing.
8. Each correct answer carries four marks. One mark will be deducted for each incorrect answer from the total score.
9. Before handing over the answer sheet to the invigilator, candidate should check that Roll No. and Centre Code have been filled and marked correctly.
10. Immediately after the prescribed examination time is over, the answer sheet to be returned to the invigilator.
11. There are two sections in each subject i.e., Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions out of 15 from Section-B.

Note : It is compulsory to fill **Roll No.** and **Test Booklet Code** on answer sheet, otherwise your answer sheet will not be considered.



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Open Mock Test No. 6

TOPICS OF THE TEST

Complete Syllabus of NEET

MM : 720

OPEN MOCK TEST - 6

Time : 3 hrs. 20 min

[PHYSICS]

Choose the correct answer:

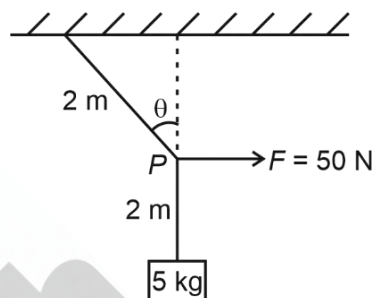
SECTION-A

1. Match the scientist's name from column-I against discoveries given in column-II and choose the correct option among the following

	Column-I		Column-II
A.	Faraday	(P)	Scattering of light by molecules
B.	Newton	(Q)	Law of EMI
C.	Einstein	(R)	Law of gravitation
D.	C.V. Raman	(S)	Theory of relativity

- (1) A(R), B(S), C(P), D(Q)
 (2) A(P), B(Q), C(R), D(S)
 (3) A(Q), B(R), C(S), D(P)
 (4) A(S), B(R), C(Q), D(P)
2. Resistance of a given wire is obtained by measuring the current flowing in it and the voltage difference applied across it. If the percentage errors in the measurement of the current and the voltage difference are 5% and 3% respectively, then the maximum percentage error in the calculation of resistance of the wire is nearly
- (1) 2% (2) 6%
 (3) 8% (4) 5%
3. Which of the following statement is correct corresponding to the velocity-time graph of a particle?
- (1) The curve can be a circle
 (2) The area under the curve with the time axis between any two instants gives the average acceleration
 (3) The slope at any instant gives the rate of change of acceleration at that instant
 (4) The area under the curve with the time axis gives the displacement
4. A particle is projected in vertical plane (xy plane with y-axis along vertical). If the equation of the path of the particle is $y = x - g \frac{x^2}{25}$, where y and x are in m, then the speed of projection in m/s is
- (1) 20 (2) 25
 (3) 10 (4) 5

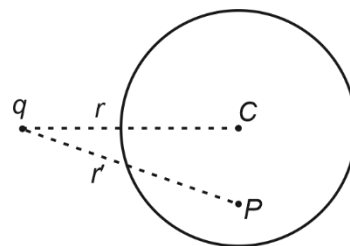
5. A mass of 5 kg is suspended by a rope of length 4 m from the ceiling. A force of 50 N in the horizontal direction is applied at midpoint P of the rope as shown. Tension in part of string attached to the ceiling is

(Neglect the mass of the rope, $g = 10 \text{ m/s}^2$)

- (1) 70.7 N (2) 50 N
 (3) 84.5 N (4) 100 N
6. A machine delivers power to a body which is directly proportional to velocity (v) of the body. If the body starts from rest then distance covered by the body is proportional to
- (1) v^2 (2) $v^{3/2}$
 (3) $v^{1/2}$ (4) v^3
7. When ' n ' number of particles of mass $m, 2m, 3m, \dots, nm$ are at distances $x_1 = 1, x_2 = 2, x_3 = 3, \dots, x_n = n$ units respectively from origin on the x-axis, then find the distance of centre of mass of the system from origin.
- (Given, $1^2 + 2^2 + 3^2 \dots n^2 = \frac{(n+1)(2n+1)n}{6}$)
- (1) $\frac{3n+1}{2}$ (2) $\frac{2n+1}{3}$
 (3) $\frac{2n^3+3}{3}$ (4) $\frac{2n^3+2}{6}$
8. Three spherical balls of masses 1 kg, 2 kg and 3 kg are placed at the corners of an equilateral triangle of side 1 m. Find the magnitude of the net gravitational force exerted by 2 kg and 3 kg masses on 1 kg mass.

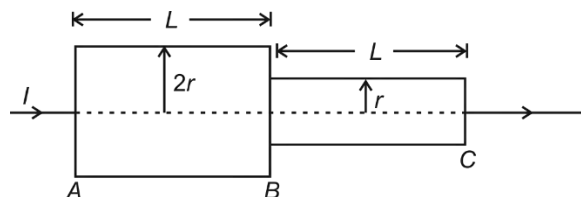
- (1) $\sqrt{13} G$ (2) $\sqrt{17} G$
 (3) $\sqrt{14} G$ (4) $\sqrt{19} G$

9. In which of the following case, length of a rod made up of an elastic material changes?
- If it falls freely vertically under gravity
 - If it is pulled along its length by a force acting at one end
 - If it is rotated about an axis passing through it and parallel to its length
 - If it slides uniformly on a smooth horizontal surface
10. A spherical ball of unknown material of radius ' R ' has a concentric cavity of radius $R/3$ inside it. The sphere is found to just float in water with the highest point of it touching the water surface. Density of the material of the sphere (in g/cc) is
- $\frac{9}{8}$
 - $\frac{8}{9}$
 - $\frac{26}{27}$
 - $\frac{27}{26}$
11. Uniform pressure P is exerted on all sides of a solid cube of bulk modulus B and coefficient of volume expansion γ , at temperature $t^\circ\text{C}$. By what amount should the temperature of cube be raised in order to bring its volume back to the value it had before the pressure was applied?
- $\frac{P}{\gamma B}$
 - $\frac{B}{\gamma P}$
 - $\frac{2B}{\gamma P}$
 - $\frac{2P}{\gamma B}$
12. During an adiabatic process, if the pressure of an ideal gas is proportional to $T^{5/2}$, where T is absolute temperature, then ratio of molar specific heat of the gas at constant pressure and constant volume will be
- $\frac{5}{2}$
 - $\frac{5}{3}$
 - $\frac{5}{7}$
 - $\frac{7}{5}$
13. If ' x ', ' v ' and ' a ' denote the position, velocity and acceleration w.r.t. mean position of a particle executing simple harmonic motion of time period T , then which of the following quantities does not change with time?
- $\frac{aT^2}{\pi x}$
 - $\frac{aT}{x}$
 - $\frac{aT^2}{\pi v}$
 - Both (1) and (2)
14. Which of the following statement about basic assumptions of kinetic theory of gases is wrong?
- The molecules of a gas are in continuous random motion
 - The molecule continuously undergo inelastic collisions with the walls of the container
 - The molecules do not interact with each other except during collisions
 - Number of gas molecules in a container is of the order of Avogadro number
15. Consider the two statements given below and choose the correct option.
- Statement-I:** When standing waves are produced in a closed organ pipe, the pressure amplitude at the closed end is constant.
- Statement-II:** The closed end corresponds to a pressure node and hence the pressure is constant.
- Statement-I is correct while statement-II is incorrect
 - Statement-I is incorrect while statement-II is correct
 - Both statement-I and statement-II are correct
 - Both statement-I and statement-II are incorrect
16. A capacitor of capacitance 10 mF is charged up to a potential difference of 2 V and then the cell is removed. Now it is connected to a cell of emf 4 V and is charged fully. In both cases the polarities of the two cells are in the same directions. Total heat produced in the second charging process is
- 10 mJ
 - 20 mJ
 - 40 mJ
 - 80 mJ
17. A neutral conducting spherical shell is kept near a charge q as shown. The potential at point P due to the induced charges on the spherical shell is



- $\frac{Kq}{r}$
- $\frac{Kq}{r'}$
- $\frac{Kq}{r'} + \frac{Kq}{r}$
- $\frac{Kq}{r} - \frac{Kq}{r'}$

18. Two bars of radius r and $2r$ are kept in contact as shown. An electric current I is passed through the bars. Which one of following is correct?



- (1) Heat produced in bar BC is 4 times the heat produced in bar AB
- (2) Heat produced in bar AB is 4 times the heat produced in bar BC
- (3) Heat produced in bar BC is 2 times the heat produced in bar AB
- (4) Heat produced in bar AB is 2 times the heat produced in bar BC

19. A region contains both positive and negative ions initially at rest. Then after some time if they are subjected simultaneously to an electric field along the $+x$ direction and a magnetic field along the $+z$ direction, then

- (1) Positive ions deflect towards $+y$ direction and negative ions towards $-y$ direction
- (2) All ions deflect towards $+y$ direction
- (3) All ions deflect towards $-y$ direction
- (4) Positive ions deflect towards $-y$ direction and negative ions towards $+y$ direction

20. A light beam travelling in the x -direction is described by the electric field

$$E_y = (300 \text{ V m}^{-1}) \sin \left(\omega \left(t - \frac{x}{c} \right) \right).$$

An electron is constrained to move along y -direction with a speed of $2 \times 10^7 \text{ m s}^{-1}$. The maximum magnetic force on electron is

- (1) $4.8 \times 10^{-17} \text{ N}$
- (2) $6.2 \times 10^{-15} \text{ N}$
- (3) $4.2 \times 10^{-17} \text{ N}$
- (4) $3.2 \times 10^{-18} \text{ N}$

21. A helicopter has metallic blades with a length of 5 m extending outward from a central hub and rotating at 3 rev/s. If the vertical component of the earth's magnetic field is $40 \mu\text{T}$, then the emf induced between the blade tip and the centre hub is

- (1) 18.8 mV
- (2) 9.4 mV
- (3) 4.7 mV
- (4) 37.6 mV

22. Consider the quantities given in column-I and in column-II

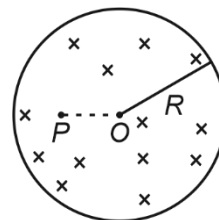
	Column-I		Column-II
A.	$\frac{1}{\epsilon_0}$	(P)	$\vec{M} \times \vec{B}$
B.	\vec{p}	(Q)	$\frac{\mu_0 2\vec{M}}{4\pi r^3}$
C.	$\vec{p} \times \vec{E}$	(R)	\vec{M}
D.	$2 \frac{\vec{p}}{4\pi\epsilon_0 r^3}$	(S)	μ_0

Which of the following options correctly matches the quantities from electrostatics with their analogue in magnetism?

(Here, symbols have their usual meaning)

- (1) A(P), B(Q), C(R), D(S)
 - (2) A(P), B(S), C(R), D(Q)
 - (3) A(S), B(R), C(P), D(Q)
 - (4) A(S), B(R), C(Q), D(P)
23. In a cylindrical region of radius R , a uniform magnetic field is there which is increasing with time as $B = B_0 t^2$. A positive point charge q is released from rest at point P such that $OP = R/2$, at $t = 1 \text{ s}$.

The electric force experienced by the point charge just after it is released, is ($R = 2 \text{ m}$)



- (1) qB_0
- (2) $2qB_0$
- (3) $qB_0/2$
- (4) $q/2B_0$

24. In a compound microscope, the intermediate image is

- (1) Virtual, erect and magnified
- (2) Real, inverted and equal in size
- (3) Real, inverted and magnified
- (4) Virtual, erect and equal in size

25. In YDSE, which among the following colour of light have widest fringe width?

(YDSE setup is same for all)

- (1) Blue
- (2) Yellow
- (3) Red
- (4) Green

26. What is the de Broglie wavelength associated with an electron, accelerated through a potential difference of 200 volts?

- (1) 0.087 nm (2) 1.23 nm
(3) 0.048 nm (4) 0.87 nm

27. The frequency (hertz) and intensity (watt/m²) of a light source, both are doubled. Consider the following statements.

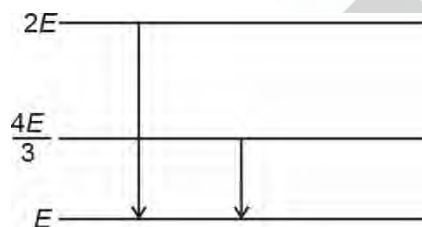
- (i) The saturation photocurrent remains almost the same.
(ii) The maximum kinetic energy of the photoelectrons is doubled.

- (1) Both (i) and (ii) are true
(2) (i) is true but (ii) is false
(3) (i) is false but (ii) is true
(4) Both (i) and (ii) are false

28. If an orbital electron of the hydrogen atom jumps from the ground state to a higher energy state, its orbital speed reduces to half of its initial value. If the radius of the electron orbit in the ground state is r , then the radius of the new orbit would be

- (1) $2r$ (2) $4r$
(3) $8r$ (4) $16r$

29. The following diagram indicates the energy levels of a certain atom when the system moves from $2E$ level to E , a photon of wavelength λ is emitted. The wavelength of photon produced during its transition from level $\frac{4E}{3}$ to E is



- (1) $\frac{\lambda}{3}$ (2) $\frac{12\lambda}{4}$
(3) $\frac{4\lambda}{3}$ (4) $\frac{2\lambda}{3}$

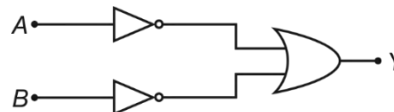
30. The energy of electron in a Bohr's orbit of hydrogen atom is -3.4 eV. The angular momentum of this electron is

- (1) $\frac{h}{4\pi}$ (2) $\frac{h}{3\pi}$
(3) $\frac{2h}{\pi}$ (4) $\frac{h}{\pi}$

31. A p-type semiconductor has acceptor levels 38 meV above the valence band. Find the maximum wavelength (in m) of light which can create a hole.

- (1) 5.06×10^{-5} (2) 6.23×10^{-5}
(3) 1.26×10^{-5} (4) 3.26×10^{-5}

32. The output Y for the following logic gate circuit will be



- (1) $\overline{A+B}$ (2) $\overline{A \cdot B}$
(3) $\overline{A} \cdot \overline{B}$ (4) $\overline{A \cdot B}$

33. A radioactive sample ${}_Z^AX^A$ undergoing alpha decay has half life period of 1.25 years. What fraction of this sample will decay in 5 years?

- (1) $\frac{1}{16}$ (2) $\frac{1}{8}$
(3) $\frac{15}{16}$ (4) $\frac{7}{8}$

34. Unpolarised light is incident on a plane glass surface having refractive index 1.5. What should be the angle of incidence so that the reflected and refracted rays are perpendicular to each other?

(use $\sin 57^\circ = \frac{3}{\sqrt{13}}$)

- (1) 53° (2) 57°
(3) 37° (4) 127°

35. Consider the following two statements and mark the correct option.

- A. One internal reflection inside a drop takes place during the formation of a Primary rainbow.
B. Two internal reflections inside a drop take place while the formation of a Secondary rainbow

- (1) Statement A is correct while statement B is incorrect
(2) Statement A is incorrect while statement B is correct
(3) Both statement A and statement B are correct
(4) Both statement A and statement B are incorrect

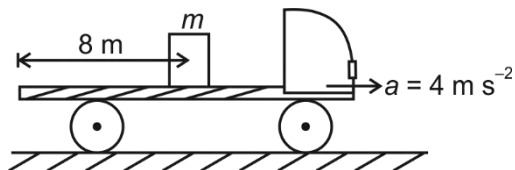
SECTION-B

36. A stone is dropped from a certain height above the ground. After 6 second this stone passes through a glass sheet of negligible thickness held horizontally and instantaneously loses $\frac{1}{3}$ of its velocity. If the

stone takes 3 more seconds to reach the ground, the height of the glass sheet above the ground is

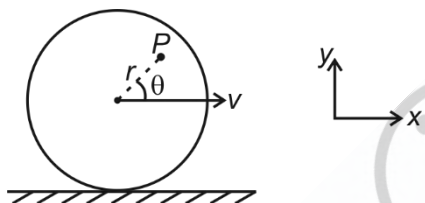
- (1) 145 m (2) 165 m
(3) 205 m (4) 125 m

37. The rear side of a trolley is open. A box of 6 kg mass is placed 8 m away from the open end of trolley as shown in figure. The coefficient of friction between the box and the surface is 0.2. On a straight road, the trolley starts from rest with an acceleration of 4 m/s^2 . The time after which the block will fall from truck?



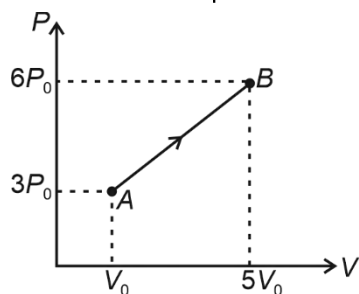
- (1) 1 s (2) 2 s
(3) $\sqrt{2}$ s (4) $2\sqrt{2}$ s

38. A uniform circular disc of radius R rolls without slipping with its centre of mass moving along positive x -axis with a speed v . The velocity of point P at the instant shown in figure is



- (1) $\vec{v}_P = \left(v + \frac{v}{R} r \sin \theta \right) \hat{i} + \frac{v}{R} r \cos \theta \hat{j}$
(2) $\vec{v}_P = \left(v + \frac{v}{R} r \sin \theta \right) \hat{i} - \frac{v}{R} r \cos \theta \hat{j}$
(3) $\vec{v}_P = \left(v + \frac{v}{R} r \cos \theta \right) \hat{i} - \frac{v}{R} r \sin \theta \hat{j}$
(4) $\vec{v}_P = \left(v + \frac{v}{R} r \cos \theta \right) \hat{i} + \frac{v}{R} r \sin \theta \hat{j}$

39. One mole of a monatomic ideal gas undergoes the process A to B as shown in the given P - V diagram. The specific heat for this process is

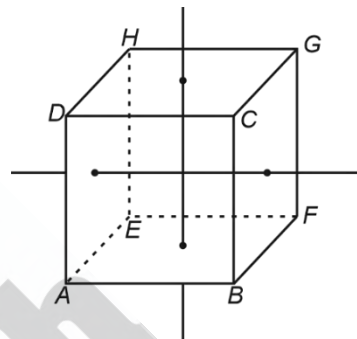


- (1) $\frac{14R}{5}$ (2) $\frac{11R}{7}$
(3) $\frac{13R}{6}$ (4) $\frac{7R}{9}$

40. A mass of 2 kg oscillates with a spring of force constant 50 N/m. By what percentage does the frequency of oscillation decrease when a damping force with constant $b = 12 \text{ N s/m}$ is introduced?

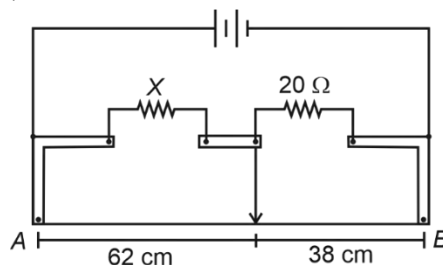
- (1) 30% (2) 40%
(3) 20% (4) 10%

41. Two infinite line charges, each having uniform charge density λ , pass through the mid points of two pairs of opposite faces of a cube of edge ' L ' as shown in figure. The modulus of the total electric flux due to both the line charges through the face $ABCD$ is



- (1) $\frac{\lambda L}{4\epsilon_0}$ (2) $\frac{\lambda L}{3\epsilon_0}$
(3) $\frac{\lambda L}{2\epsilon_0}$ (4) $\frac{\lambda L}{6\epsilon_0}$

42. A meter bridge is set-up as shown in figure, to determine an unknown resistance X using a standard 20 ohm resistor. The galvanometer shows null point when tapping key is at 62 cm mark. The end corrections are 1 cm and 2 cm respectively for the ends A and B . The determined value of X is (in ohm)

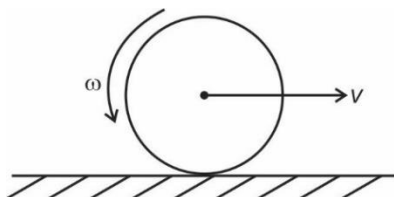


- (1) 25 (2) 31.5
(3) 41.5 (4) 38

43. The rms current value of a sinusoidal wave which has a maximum value I_0 is

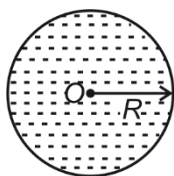
- (1) $\frac{I_0}{\sqrt{3}}$ (2) $\frac{I_0}{\sqrt{2}}$
(3) $2I_0$ (4) $\sqrt{\frac{2}{3}} I_0$

44. The size of the image of an object, which is at infinity, as formed by a convex lens of focal length 30 cm is 2 cm. If a concave lens of focal length 20 cm is placed between the convex lens and the image at a distance of 26 cm from the convex lens, calculate the new size of the image.
- (1) 1.25 cm (2) 3.75 cm
(3) 2.5 cm (4) 3.5 cm
45. For what distance is ray optics a good approximation when the aperture is 2.236 mm wide and the wavelength is 800 nm?
- (1) 5.6 m (2) 9.2 m
(3) 6.6 m (4) 6.25 m
46. A hollow sphere is projected with speed v and angular velocity $\omega = \frac{v}{R}$ on a rough horizontal surface as shown in the figure.



Speed of centre of mass of the hollow sphere, when it starts pure rolling, will be (R = radius of hollow sphere)

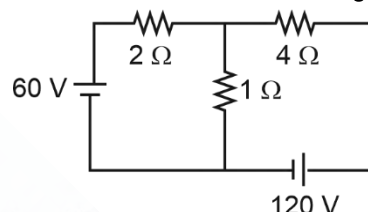
- (1) $\frac{3v}{2}$ (2) $\frac{5v}{3}$
(3) $\frac{v}{7}$ (4) $\frac{v}{5}$
47. A spherical volume of radius R contains a uniform charge density $-\rho$ lying inside it as shown in the figure.



Electric potential at the centre 'O' of the spherical region will be

- (1) $\frac{-\rho R^2}{\epsilon_0}$
(2) $\frac{-\rho R^2}{3\epsilon_0}$
(3) $\frac{-\rho R^2}{2\epsilon_0}$
(4) $\frac{-\rho R}{2\epsilon_0}$

48. An electrical circuit is shown in the figure below.



The value of current in 1 Ω resistor is

- (1) $\frac{120}{7}$ A (2) $\frac{60}{7}$ A
(3) $\frac{240}{7}$ A (4) $\frac{180}{7}$ A
49. A travelling wave gets reflected at a boundary such that amplitude of the reflected wave is one third of the incident wave. Percentage of energy transmitted to the other medium will be nearly
- (1) 89% (2) 67%
(3) 75% (4) 33%
50. A container has 0.5 m³ volume and it contains 4.0 ml of oxygen at 300 K. What percentage of the total internal energy is the translational kinetic energy of the gas molecules?
- (1) 50% (2) 40%
(3) 60% (4) 100%

[CHEMISTRY]

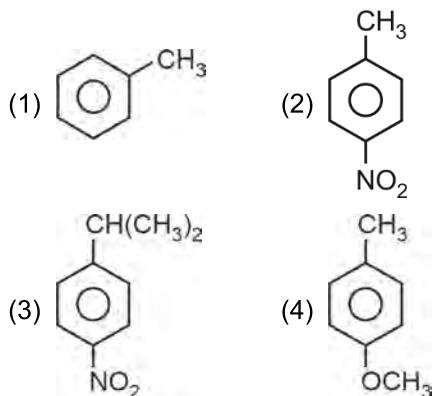
SECTION-A

51. Number of peroxy oxygen(s) present in 0.1 mol $\text{H}_2\text{S}_2\text{O}_8$ is
- (1) 0.1 N_A (2) 0.2 N_A
(3) 0.8 N_A (4) 1.6 N_A
52. Molarity of an aqueous solution containing 40 g NaOH in 2 L solution is
- (1) 2 M (2) 0.5 M
(3) 0.2 M (4) 1 M

53. Possible number of orbital(s) in sodium atom for which $n + l = 3$, is
- (1) 3
(2) 4
(3) 2
(4) 1
54. Select the element of largest atomic size among the following
- (1) Li (2) Na
(3) Rb (4) Be

55. Which among the following molecule has sp^2 hybridized central atom?
 (1) CO_2 (2) CH_4
 (3) CCl_4 (4) SO_2
56. Total number of $p\pi - d\pi$ bond(s) present in CO_2 molecule is
 (1) 1 (2) 2
 (3) 4 (4) Zero
57. Number of 90° bond angles possible in SeF_6 molecule is
 (1) 4 (2) 2
 (3) 8 (4) 12
58. Select the polar molecule among the following
 (1) BeCl_2 (2) H_2O
 (3) PCl_5 (4) CCl_4
59. The gas which will effuse most easily at NTP is
 (1) N_2 (2) Ar
 (3) NH_3 (4) F_2
60. 1 mol monoatomic ideal gas compressed reversibly from 10 L to 1 L at 27°C . The work involved in the process will be
 (1) 300 R (2) $2.303 \times 27 \text{ R}$
 (3) 2.303 R (4) $2.303 \times 300 \text{ R}$
61. Molar heat capacity of a gas undergoing adiabatic process is
 (1) Zero (2) 1
 (3) 100 (4) Infinite
62. Which among the following processes involves increase of entropy?
 (1) Atomisation of $\text{H}_2(\text{g})$
 (2) Condensation of water vapours
 (3) Polymerization
 (4) Crystallisation of sugar
63. The reaction for which enthalpy of reaction is twice of enthalpy of formation is
 (1) $\frac{1}{2}\text{H}_2(\text{g}) + \frac{1}{2}\text{Cl}_2(\text{g}) \longrightarrow \text{HCl}(\text{g})$
 (2) $\text{H}_2(\text{g}) + \text{Br}_2(\text{g}) \longrightarrow 2\text{HBr}(\text{g})$
 (3) $\text{C}(\text{s}) + \text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g})$
 (4) $\text{H}_2(\text{g}) + \text{I}_2(\text{s}) \longrightarrow 2\text{HI}(\text{g})$
64. pH of an aqueous solution of 0.01 M NaOH at 25°C is
 (1) 10 (2) 2
 (3) 12 (4) 8
65. Which pair of solution can form an acidic buffer?
 (1) CH_3COOH and HCl
 (2) CH_3COONa and NaOH
 (3) NaOH and HCl
 (4) CH_3COOH and NaOH
66. Solubility of AgBr ($K_{sp} = 5 \times 10^{-13}$) in an aqueous solution of 0.1 M NaBr is
 (1) $5 \times 10^{-8} \text{ M}$ (2) $5 \times 10^{-12} \text{ M}$
 (3) $5 \times 10^{-13} \text{ M}$ (4) $5 \times 10^{-14} \text{ M}$
67. In which among the following compounds, the oxidation state of central atom is maximum?
 (1) HNO_2 (2) H_2SO_3
 (3) H_3PO_3 (4) HClO_4
68. Saline hydride among the following is
 (1) NaH (2) NH_3
 (3) CH_4 (4) CrH
69. Percentage strength of 28 volume of H_2O_2 is
 (1) 8.5% (2) 17%
 (3) 25.5% (4) 51%
70. Which among the following is most soluble in water?
 (1) BeSO_4 (2) MgSO_4
 (3) CaSO_4 (4) BaSO_4
71. Select the configuration for which Jahn-Teller effect is not observed in octahedral complexes
 (1) d^7 (2) d^2
 (3) d^4 (4) d^8
72. Hydrolysis of borax gives
 (1) H_3BO_3 only (2) NaBO_2 and B_2O_3
 (3) Na_2O and B_2O_3 (4) H_3BO_3 and NaOH
73. Select the correct statements among the following
 a. Carbon has highest catenation property among its group elements.
 b. SiF_6^{2-} is known whereas SiCl_6^{2-} is not.
 c. Due to presence of weakest covalent bonds in diamond, it has very low melting point.
 d. Fullerenes are cage like molecules.
 (1) Only a and c (2) Only a and d
 (3) Only a, b and c (4) Only a, b and d
74. In sulphur estimation, 0.2 g of an organic compound gave 0.5 g of barium sulphate. What is the percentage of sulphur in the compound?
 (Atomic mass (Ba) = 137 u)
 (1) 13.33% (2) 66.67%
 (3) 34.33% (4) 82.33%

75. Which among the following compounds give fastest electrophilic aromatic substitution?



76. Total number of unit cells in 29.25 g NaCl is

(1) 5.0×10^{22} (2) 7.5×10^{22}
(3) 5.0×10^{23} (4) 7.5×10^{23}

77. A binary liquid is formed by taking two volatile liquids A ($P_A^\circ = 400$ torr) and B ($P_B^\circ = 300$ torr). Mole fraction of A in vapour mixture if A and B liquids are mixed in the molar ratio of 2:3 is

(1) 2/3 (2) 8/17
(3) 2/5 (4) 3/5

78. E_{cell} of $\text{Pt} | \text{H}_2(1 \text{ atm}) | \text{H}^+(\text{aq})(\text{pH} = 2) || \text{Ag}^+(0.1 \text{ M}) | \text{Ag}(\text{s})$, at 298 K is ($E_{\text{cell}}^\circ = 0.8 \text{ V}$)

(1) 0.65 V (2) 0.86 V
(3) 0.43 V (4) 0.53 V

79. Select the aqueous solution among the following of highest conductivity at 298.15 K

(1) 0.1 M HCl (2) 0.01 M KCl
(3) 0.1 M CH_3COOH (4) 0.01 M CH_3COOH

80. Molar conductivity ($\text{S cm}^2 \text{ mol}^{-1}$) in 0.08 mol L^{-1} NaOH solution of conductivity of 0.01 S cm^{-1} will be

(1) 100 (2) 125
(3) 250 (4) 187.5

81. The rate constant of the reaction, $\text{A} \rightarrow \text{B}$ is $0.3 \times 10^{-3} \text{ mol L}^{-1} \text{ s}^{-1}$. If the initial concentration of A is 10 M, then concentration of B after 20 minutes is

(1) 0.8 M (2) 8 M
(3) 0.36 M (4) 0.72 M

82. Select the correct statement among the following

(1) Measuring zeta potential is useful in determining stability of colloidal particles
(2) PdCl_2 can convert ethanol to ethyne
(3) The protecting power of lyophilic colloidal sol is expressed in terms of oxidation number
(4) Coenzymes act as catalyst poisons

83. Liquation process used for refining of

(1) Copper (2) Iron
(3) Tin (4) Nickel

84. Select the correct characteristic property of nitrogen compound obtained upon heating of ammonium nitrate.

(1) It is colourless solid
(2) It is neutral in nature
(3) It does not have 'N – N' bond
(4) It is paramagnetic in nature

85. Which among the following oxyacid of phosphorus has lowest number of 'P–OH' bond(s)?

(1) $\text{H}_4\text{P}_2\text{O}_6$ (2) H_3PO_2
(3) H_3PO_3 (4) $\text{H}_4\text{P}_2\text{O}_7$

SECTION-B

86. Thermal decomposition of $\text{Ag}_2\text{O}(\text{s})$ gives

(1) $\text{AgO}(\text{s})$ and $\text{O}_2(\text{g})$ (2) $\text{Ag}(\text{s})$ and $\text{O}_2(\text{g})$
(3) $\text{AgO}(\text{s})$ and $\text{O}_3(\text{g})$ (4) $\text{Ag}(\text{s})$ and $\text{O}_3(\text{g})$

87. Select the correct statement(s) among the following

(a) OF_2 is thermally unstable at 298 K.
(b) I_2O_5 is a very good reducing agent and is used for estimation of carbon dioxide.
(c) Chlorine water has bleaching property.

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

88. KMnO_4 when treated with oxalate ion at 333 K, it produces

(1) CO (2) CO_2
(3) C_3O_7 (4) Elemental carbon

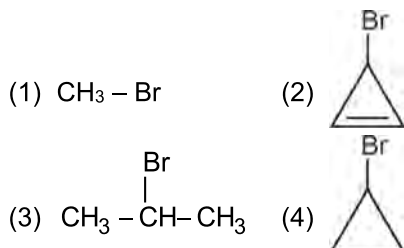
89. Which among the following complex species can show optical isomerism?

(1) $\text{K}_2[\text{PtCl}_4]$
(2) $[\text{Zn}(\text{H}_2\text{O})_4\text{Cl}_2]$
(3) $[\text{Co}(\text{NH}_3)_3(\text{H}_2\text{O})_3]\text{Cl}_3$
(4) $\text{K}_3[\text{Co}(\text{ox})_2\text{Cl}_2]$

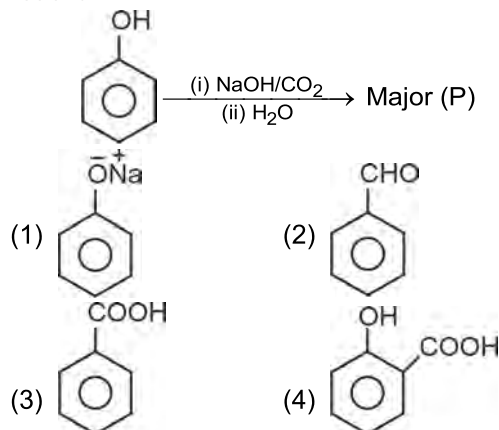
90. Which among the following has highest 'C–X' bond enthalpy?

(1) CH_3F (2) CH_3Cl
(3) CH_3Br (4) CH_3I

91. Select the molecule which most easily undergoes $\text{S}_{\text{N}}1$ reaction?



92. Identify the major product (P) in the following reaction.



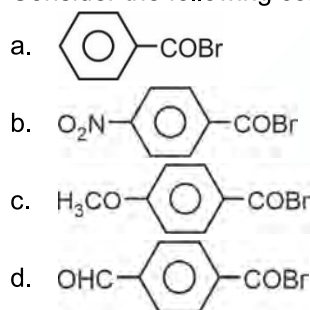
93. Which pair of compounds can be distinguished by haloform reaction?

- (1) PhCOCH_3 and $\text{CH}_3\text{CH}_2\text{COC}_2\text{H}_5$
 (2) CH_3OH and HCOOH
 (3) CH_3COCH_3 and $\text{CH}_3\text{CH}_2\text{OH}$
 (4) CH_3OH and CH_3COOH

94. Which among the following compounds responds carbylamine test?

- (1) $\text{CH}_3\text{CH}_2\text{NHCH}_3$ (2) PhCH_2NH_2
 (3) $\text{PhCH}_2\text{NHCH}_3$ (4) $(\text{CH}_3)_2\text{NC}_2\text{H}_5$

95. Consider the following compounds



The correct decreasing order of their reactivity towards hydrolysis is

- (1) $b > d > a > c$ (2) $d > c > a > b$
 (3) $c > d > a > b$ (4) $c > b > a > d$

96. Match the products of Column-II with reactions of Column-I

Column-I	Column-II
a.	(i)
b.	(ii)
c.	(iii)
d.	(iv)

Select the correct option.

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

97. Consider the following statement(s).

- (a) In a protein molecule, various amino acids are linked together by peptide bonds.
 (b) Low level of iodine in the diet may lead to hypothyroidism.
 (c) The human body does not produce enzymes.

The correct statements are

- (1) Only a & b (2) Only a & c
 (3) Only b & c (4) Only a, b & c

98. Select the incorrect match of monomeric units present in their given polymers

- (1) PVC : $\text{CH}_2 = \text{CH} - \text{Cl}$

- (2) Polystyrene :

- (3) Nylon-2-Nylon-6 : $\text{H}_2\text{N} - (\text{CH}_2)_2 - \text{COOH}$ and $\text{H}_2\text{N} - (\text{CH}_2)_4 - \text{COOH}$

- (4) Neoprene :

99. Which among the following is not used as an antiseptic?

- (1) Tincture of iodine
 (2) Dilute aqueous solution of borax
 (3) Soframycin
 (4) Alitame

100. Match the items of list-I to list-II

	List-I		List-II
(a)	Polychlorinated biphenyl	(i)	Pathogens
(b)	Escherichia coli	(ii)	Cleansing solvent
(c)	Dieldrin	(iii)	Herbicide
(d)	Sodium chlorate	(iv)	Pesticide

Select the correct option.

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

[BOTANY]

SECTION-A

101. Which one of the following has circular single stranded DNA as its genetic material?
- Lambda phage
 - Escherichia coli*
 - $\phi \times 174$ bacteriophage
 - Human genome
102. Streptokinase is
- Produced by yeast *Monascus purpureus*
 - Used as clot buster
 - Used as immunosuppressive agent
 - Used to degrade starch
103. Pathogen free clones of plants are obtained through
- Callus culture
 - Suspension culture
 - Embryo culture
 - Meristem culture
104. All of the given seeds are non-endospermous, **except**
- Castor
 - Gram
 - Pea
 - Bean
105. Which among the following is **not** a characteristic of monocot stem?
- Vascular bundles are conjoint, collateral and closed
 - Bundle sheath surrounds vascular bundle
 - Water containing cavities are absent
 - Sclerenchymatous hypodermis
106. Match the following algae with pigments present in them.

Column-I

- (A) *Ulothrix*
(B) *Ectocarpus*
(C) *Porphyra*

Column-II

- (i) Fucoxanthin
(ii) Phycoerythrin
(iii) Chlorophyll a & b

Select the **correct** option.

- | | A | B | C |
|-----|-----|-----|-----|
| (1) | iii | ii | i |
| (2) | iii | i | ii |
| (3) | ii | iii | i |
| (4) | ii | i | iii |

107. State true (T) or false (F) for the following statements and select the **correct** option.

- (A) In members of Phycmycetes, asexual spores are endogenously produced in sporangium.
(B) In *Aspergillus*, basidiospores are exogenously produced on the basidium.
(C) *Trichoderma* reproduces only by sexual spores known as conidia.

A	B	C
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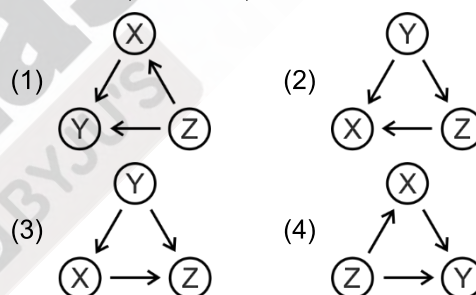
- | | | | |
|-----|---|---|---|
| (1) | F | T | F |
| (2) | F | F | T |
| (3) | T | T | F |
| (4) | T | F | F |

108. What will be the direction of movement of water in given cells X, Y and Z adjoining to each other.

Cell X $\rightarrow \psi_s = -54, \psi_p = 24$

Cell Y $\rightarrow \psi_w = -27, \psi_s = -27$

Cell Z $\rightarrow \psi_s = -60, \psi_p = 31$

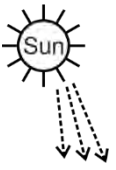


109. Toxicity of manganese will lead to

- Appearance of white spots and reduction in uptake of iron and nickel
- Delay in flowering and reduction in uptake of iron and sulphur
- Appearance of brown spots and reduction in uptake of iron and magnesium
- Deficiency of nitrogen, potassium and molybdenum

110. Which among the following is **not** a dedifferentiated tissue?

- Cork
- Cork cambium
- Interfascicular vascular cambium
- Wound cambium

111. Select the **incorrect** match among the following.
- (1) Sickle cell anaemia – Sex linked recessive disorder
 - (2) Haemophilia – Sex linked recessive disorder
 - (3) Phenylketonuria – Autosomal recessive disorder
 - (4) Thalassemia – Autosomal-linked recessive disorder
112. Read the following characteristic of flowers. Identify the type of pollination that occur in this plant
- I. Sticky pollen grains
 - II. Colourful and fragrant flowers
 - III. Large sized flower
 - IV. Nectaries are present
- (1) Anemophily (2) Epihydrophily
 - (3) Entomophily (4) Hypohydrophily
113. All of the following show internal fertilisation, **except**
- (1) Bryophytes (2) Gymnosperms
 - (3) Most of the algae (4) Angiosperms
114. What factors will contribute to increase in density of a population in a given habitat?
- (1) Natality and immigration
 - (2) Mortality and emigration
 - (3) Mortality and natality
 - (4) Emigration and immigration
115. Analyse the given food chain and find out the amount of energy available for the organism at third trophic level. The amount of energy available at producer level is 50,000 J.
- 
- Grass → Rabbit → Snake → Eagle
- Select the correct option.
- (1) 5 kJ (2) 50 kJ
 - (3) 0.5 kJ (4) 10 kJ
116. Select the example of on-site conservation of biodiversity?
- (1) Zoological park (2) Botanical garden
 - (3) Wildlife safari (4) Biosphere reserve
117. Which of the given promotes seed germination and inhibit dormancy?
- (1) ABA
 - (2) Gibberellic acid
 - (3) Para ascorbic acid
 - (4) Phenolic acid
118. How many ATP molecules are directly produced in Krebs cycle if one glucose molecule is used as respiratory substrate?
- (1) 2 (2) 4
 - (3) 3 (4) 6
119. Read the following statements and select the correct option.
- Statement-A:** Amino acid phenylalanine is coded by codon UUU only.
- Statement-B:** AUG normally codes for methionine.
- (1) Only statement B is incorrect
 - (2) Only statement A is incorrect
 - (3) Both statements A and B are correct
 - (4) Both statements A and B are incorrect
120. What will be the number of different types of gametes produced by an organism having genotype AABbCcDdeeFF
- (1) 8 (2) 64
 - (3) 16 (4) 32
121. Both normal husband and wife have colourblind father. What percentage of their son would be colourblind?
- (1) 0% (2) 25%
 - (3) 50% (4) 100%
122. How many nuclei are involved in the double fertilisation event in an angiosperm?
- (1) Five (2) Two
 - (3) Three (4) Eight
123. Zoospores are asexual reproductive structure of
- (1) *Hydra* (2) *Penicillium*
 - (3) *Chlamydomonas* (4) *Aspergillus*
124. A complex of Electron Transport Chain with two copper centres is
- (1) NADH dehydrogenase
 - (2) Cytochrome c oxidase complex
 - (3) Succinate dehydrogenase
 - (4) Cytochrome bc_1 complex
125. When stamens are attached to the perianth, the condition is called
- (1) Monodelphous
 - (2) Diadelphous
 - (3) Epipetalous
 - (4) Epiphyllous
126. Select the **incorrect** match w.r.t. the protozoan.
- (1) Amoeboid protozoan – *Entamoeba*
 - (2) Sporozoans – *Plasmodium*
 - (3) Ciliated protozoan – *Penicillium*
 - (4) Flagellated protozoan – *Trypanosoma*

127. Select the defining property of living organism from the following and select the **correct** option.
- Consciousness
 - Growth
 - Reproduction
 - Cellular organisation
 - Metabolism
- (1) A, D and E only (2) B, C and D only
(3) A, B and C only (4) C, D and E only
128. Select the **incorrect** statement w.r.t. lysosome.
- It is a membrane bound organelle
 - It contains almost all types of hydrolytic enzymes
 - It is formed by the process of packaging in endoplasmic reticulum
 - The enzymes present in it are functional at acidic pH
129. In which stage of meiotic prophase I, terminalisation of chiasmata occurs?
- Zygotene
 - Pachytene
 - Diakinesis
 - Diplotene
130. Which enzyme polymerises RNA with defined sequence in a template independent manner?
- Ribonuclease
 - Reverse transcriptase
 - RNA polymerase
 - Severo Ochoa enzyme
131. Smooth leaves and absence of nectar are the reasons that make the cotton variety resistance against
- Bollworm
 - Aphids
 - Jassids
 - Fruit borer
132. Consider dihybrid cross performed by Morgan in *Drosophila* to study the genes that were X-linked. Out of two crosses, first cross shows 98.7% offsprings of parental type and 1.3% are of recombinant type. In second cross, 62.8% offsprings are of parental type and 37.2% are recombinant type. This implies
- In the first case, genes are present very far from each other and in second case genes are closely located
 - In both the cases, genes are present far apart from each other
 - In first case, genes are closely located and in second case genes are far apart from each other
 - In both the cases, genes are present very close to each other
133. Bovine spongiform encephalopathy in cattle and its analogous variant Cr-Jacob disease in human is caused by
- Viruses
 - Viroids
 - Bacteria
 - Prions
134. Match the following flowers with their petal aestivation type and select the correct option.
- | Column-I | | Column-II | |
|----------------------|----------------|-----------|--|
| A. Cotton | (i) Valvate | | |
| B. Gulmohur | (ii) Vexillary | | |
| C. Bean | (iii) Twisted | | |
| D. <i>Calotropis</i> | (iv) Imbricate | | |
- | A | B | C | D |
|-----------|-------|------|-------|
| (1) (iii) | (iv) | (ii) | (i) |
| (2) (iii) | (ii) | (iv) | (i) |
| (3) (iv) | (i) | (ii) | (iii) |
| (4) (iv) | (iii) | (ii) | (i) |
135. The spread of living pteridophytes is limited and restricted to narrow geographical area because
- Some of them are heterosporous
 - They are first terrestrial plant to possess vascular tissue
 - Gametophyte require cool, damp and shady place and needs water for fertilisation
 - Sporophyll form distinct compact structure called strobili

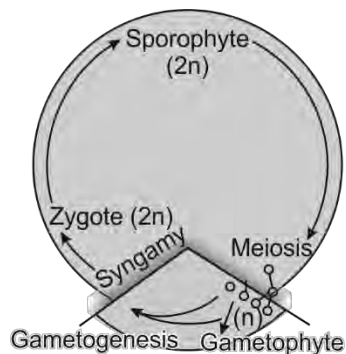
SECTION-B

136. Which among the following is responsible for guttation?
- Transpiration
 - Root pressure
 - Negative hydrostatic pressure
 - Imbibition
137. Select the **incorrect** statement w.r.t. trichomes.
- They are usually multicellular
 - They are branched/unbranched and soft or stiff
 - They help in exchange of gases
 - They may be secretory also
138. Which of the following organelles is **not** a part of endomembrane system?
- Endoplasmic reticulum
 - Vacuole
 - Lysosome
 - Ribosome

139. A book containing complete listing and description of the plants growing in a particular area and provides information for identification of names is called

- (1) Manual (2) Flora
(3) Monograph (4) Catalogue

140. Select the **incorrect** statement for the given life cycle pattern.



- (1) The sporophytic phase is dominant, photosynthetic independent phase of plant
(2) All seed bearing plant follow this life cycle pattern
(3) Gametophytic phase is always unicelled
(4) An alga *Fucus* represents this life cycle pattern

141. In light reaction, plastocyanin facilitate transfer of electrons from

- (1) Cytochrome b₆f to PS I
(2) PS II to cytochrome b₆f
(3) PS I to NADP⁺
(4) PS II to phaeophytin

142. In which of the following organisms, sex is determined by the egg?

- (1) Grasshopper
(2) *Drosophila*
(3) Butterflies
(4) *Homo sapiens*

143. In sewage treatment, the bacterial flocs allowed to sediment in the settling tank is called

- (1) Primary effluent
(2) Debris
(3) Secondary effluent
(4) Activated sludge

144. The zooplankton species in lakes and ponds are known to enter a stage of suspended development in unfavourable condition which is called

- (1) Hibernation (2) Diapause
(3) Dormancy (4) Aestivation

145. Standing crop is

- (1) Amount of nutrients present in the soil at any given time
(2) Biomass of crop present in first trophic level
(3) Amount of living material at each trophic level at a particular time
(4) Measured in terms of fresh weight only

146. What is the sequence of mRNA produced by the given stretch of DNA?

5' ATCGTGCGAT 3' coding strand

- (1) 3' TUGCACGCUA 5'
(2) 5' AUCGUGCGAU 3'
(3) 5' TUGCACGCUA 3'
(4) 3' AUCGACGCAU 5'

147. The part of chromosome beyond secondary constriction is called

- (1) Satellite
(2) Kinetochore
(3) SAT chromosome
(4) Centromere

148. Select the **incorrect** statement w.r.t. mycoplasma.

- (1) They are pathogenic to both animals and plants
(2) They are obligate aerobic organisms
(3) They are smallest living organisms
(4) They do not have cell wall

149. In which year, in India, the Air (Prevention and Control of Pollution) Act was amended to include noise as air pollutant?

- (1) 1981 (2) 1974
(3) 1986 (4) 1987

150. Extinction of over 200 species of cichlid fish from the Lake Victoria was due to

- (1) Habitat loss
(2) Over exploitation
(3) Alien species invasion
(4) Coextinction

[ZOOLOGY]

SECTION-A

151. Select the **incorrect** match w.r.t. the animal, its characteristic and the phylum to which it belongs.

Animal	Characteristic	Phylum
(1) <i>Loligo</i>	Digestion is extracellular	Mollusca
(2) <i>Adamsia</i>	Gastro-vascular cavity is present	Ctenophora
(3) <i>Locusta</i>	Chitinous exoskeleton	Arthropoda
(4) <i>Balanoglossus</i>	External fertilisation	Hemichordata

152. Consider the following characteristics.

- Flagellated choanocytes
- Reproduction only by sexual means
- Presence of hooks and suckers
- Presence of spongocoel

How many of the given characteristics are associated with the phylum Porifera?

- One
- Two
- Three
- Four

153. Choose the **correct** set of animals which have the ability to regulate their body temperature.

- Scoliodon*, *Salamandra*
- Neophron*, *Ornithorhynchus*
- Calotes*, *Pristis*
- Salpa*, *Octopus*

154. Choose the **correct** statement w.r.t. specialised connective tissue.

- Matrix occurs in the form of concentric layer (lamellae) in both cartilage and bone.
- Matrix of cartilage is solid and pliable whereas matrix of bone is hard and non-pliable.
- Bone marrow of all bones functions as erythropoietic organ during old age.
- Harversian system is present only in cartilage.

155. Match the column-I with column-II and choose the **correct** answer.

Column-I	Column-II
a. Smooth muscles	(i) Present beneath the skin
b. Neurons	(ii) Excitable cells of neural system
c. Skeletal muscles	(iii) Closely attached to bones
d. Areolar tissue	(iv) Present in the wall of blood vessels

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

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

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

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

156. Read the following statements and choose the **correct** answer.

- In male cockroach, the genital pouch lies at the hind end of abdomen bounded dorsally by 9th and 10th terga and ventrally by the 9th sternum.
- The head of cockroach is connected with thorax by a short extension of the prothorax known as the neck.

(1) Both statements are correct

(2) Both statements are incorrect

(3) Only statement A is correct

(4) Only statement B is correct

157. How many structures given in the box below are present in abdominal region of male cockroach?

Compound eyes, Malpighian tubules, Labrum, Spermatheca, Phallic gland

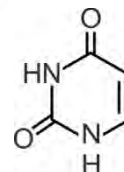
(1) One

(2) Two

(3) Three

(4) Four

158. Identify the below given diagrammatic representation of an organic compound and choose the **correct** statement about it.



(1) It is a nucleoside-adenosine

(2) It is present in ATP

(3) It is a constituent of nucleotide, uridylic acid

(4) It is a nitrogenous base-adenine

159. Cholesterol is

(1) An example of phospholipid

(2) A precursor of steroid hormones such as androgens

(3) Strictly considered under biomacromolecules

(4) Considered as saturated fatty acid

160. Which of the following is true w.r.t. inhibition of succinic dehydrogenase by malonate?

(1) The rate of reaction decreases if more amount of substrate is added

(2) Malonate closely resembles the succinate in structure

(3) The K_m value decreases

(4) V_{max} decreases

161. Total number of thecodont teeth in the lower jaw of an adult human is

- (1) 32 (2) 20
(3) 16 (4) 12

162. An enzyme 'X' which converts dipeptides into amino acids is present in 'Y'.

Choose the option which **correctly** represents X and Y.

- | X | Y |
|------------------|------------------|
| (1) Pepsin | Intestinal juice |
| (2) Trypsin | Gastric juice |
| (3) Chymotrypsin | Succus entericus |
| (4) Dipeptidase | Intestinal juice |

163. Choose the **mismatch** w.r.t. respiratory structures/organs present in organisms.

- (1) Earthworms – Moist cuticle
(2) Flatworms – Body surface
(3) *Periplaneta* – Gills
(4) *Alligator* – Lungs

164. **Assertion (A):** Humans have negative pressure breathing.

Reason (R): During inspiration, the increase in pulmonary volume decreases the intra-pulmonary pressure to less than the atmospheric pressure.

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

165. Choose the **incorrect** depiction w.r.t. the flow of blood in fishes.

- (1) Heart → Gills → Body
(2) Heart → Body → Gills
(3) Gills → Body → Heart
(4) Body → Heart → Gills

166. If cardiac output of a person is about 5040 mL and heart rate is 70 beats/min. Then, value of stroke volume is

- (1) 70 mL (2) 72 mL
(3) 80 mL (4) 90 mL

167. Time interval from beginning of joint diastole to end of atrial systole is

- (1) 0.4 seconds (2) 0.5 seconds
(3) 0.3 seconds (4) 0.8 seconds

168. Choose **incorrect** statement.

- (1) PCT and DCT of the nephrons are situated in the cortical region of the kidney.
(2) In most of the nephrons, vasa recta runs parallel to the Henle's loop.
(3) Columns of Bertini divide the medulla into many medullary pyramids.
(4) Bowman's capsule encloses the glomerulus.

169. Filtration slits are formed by

- (1) Glomerulus
(2) Inner epithelial cells of Bowman's capsule
(3) Outer epithelial cells of Bowman's capsule
(4) Efferent arteriole

170. Select the **correct** set of restriction enzymes whose recognition sequences are present in *amp^R* gene of cloning vector pBR322.

- (1) *EcoRI*, *HindIII* (2) *PstI*, *PvuI*
(3) *PvuI*, *BamHI* (4) *PvuII*, *SaI*

171. Choose the **correct** pair w.r.t immunity.

- (1) IgA – Can cross the placenta
(2) Colostrum – Contains IgG antibodies
(3) ATS – Included in natural passive immunity
(4) Antivenom – Contains antibodies

172. Choose the **incorrect** match.

- (1) Disarmed retroviruses – Can deliver desirable genes in humans
(2) Biolistics – Vector less gene transfer
(3) Natural genetic engineer of plant – Ti plasmid of *Agrobacterium tumefaciens*
(4) Insertional inactivation of *lac Z* gene – Resultant recombinants will produce blue coloured colonies

173. All of the following statements are **correct** w.r.t. gene therapy except

- (1) It allows permanent correction of genetic defect in adult stage only.
(2) The genes are inserted into a person's cells and tissues to treat a disease.
(3) Delivery of a normal gene into cells takes over the function and compensate for the non-functional gene.
(4) As a step towards gene therapy to treat ADA deficiency, a functional ADA cDNA is introduced into cultured lymphocytes of the patient and subsequently returned to him/her.

174. Match the column-I with column-II and choose the **correct** answer.

Column-I	Column-II
a. Allergy	(i) Diagnosed by Widal test
b. Rheumatoid arthritis	(ii) Auto-immune disease
c. Amoebiasis	(iii) Histamine and serotonin
d. Typhoid	(iv) Spread by contaminated food and water

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

175. Choose the **incorrect** statement w.r.t drugs.

- (1) Morphine is a very effective sedative and painkiller.
 (2) Cannabinoids are known for their effects on cardiovascular system.
 (3) Cocaine interferes with the transport of the neurotransmitter GABA.
 (4) *Atropa belladonna* has hallucinogenic properties.

176. Read the following statements w.r.t dairy farm management.

- A. Milk yield is primarily dependent on the quality of breeds in the farm.
 B. Selection of good breeds having high yielding potential along with resistance to diseases is very important.
 C. The feeding of cattle should be carried out in a random manner without emphasis on quality of fodder.

Choose the **correct** option.

- (1) A and B are correct
 (2) B and C are correct
 (3) A and C are correct
 (4) A, B and C are correct

177. A group of animals related by descent and similar in most characters like general appearance, size and configuration are said to belong to

- (1) Two different breeds
 (2) A breed
 (3) Two different but related species
 (4) Two different and unrelated species

178. In a population of 2000 individuals, 720 people are homozygous dominant for a particular trait. Then, find out the frequency of the dominant allele, 'A' and recessive allele, 'a' in the population respectively.

- (1) 0.3, 0.4 (2) 0.6, 0.4
 (3) 0.2, 0.8 (4) 0.7, 0.3

179. Choose the **odd** one w.r.t adaptive convergence.

- (1) Tendrils of *Pisum* and *Passiflora*
 (2) Sweet potato and potato
 (3) Lemur and spotted cuscus
 (4) Banded anteater and sugar glider

180. Bryophytes were evolved from A in B period.

Choose the option to **correctly** fill the blanks.

A	B
(1) Psilophyton	Devonian
(2) Chlorophyte ancestors	Carboniferous
(3) Tracheophyte ancestors	Permian
(4) Rhynia-type plants	Silurian

181. The palindromic sequence for restriction endonuclease *SaI* is

- (1) 5'-GAATTC-3' (2) 5'-GTCGAC-3'
 3'-CTTAAG-5' 3'-CAGCTG-5'
 (3) 5'-GGATCC-3' (4) 5'-CTGACC-3'
 3'-CCTAGG-5' 3'-GACTGG-5'

182. Choose the **correct** statement w.r.t follicular phase of menstrual cycle.

- (1) High blood levels of estrogen and progesterone give negative feedback to FSH and LH.
 (2) Corpus luteum secretes progesterone under the influence of LH.
 (3) Both FSH and LH attain peak level in initiation of this phase.
 (4) Primary follicles grow and usually one of them develops into a fully mature Graafian follicle at the end of this phase.

183. Which of the following STIs cannot be cured completely even if diagnosed early and treated properly?

- (1) Trichomoniasis (2) Gonorrhoea
 (3) Genital herpes (4) Syphilis

184. Embryos with more than 8-celled stages are transferred into uterus in the technique

- (1) GIFT (2) ZIFT
 (3) ICSI (4) IUT

185. A tertiary follicle is characterised by the presence of the following **except**

- (1) Antrum (2) Secondary oocyte
 (3) First polar body (4) Ootid

SECTION-B

186. Choose the **correct** match w.r.t structure of human ear.
- (1) Round window – Scala tympani
 - (2) Basilar membrane – Otolith organ
 - (3) Tectorial membrane – Sacculle
 - (4) Incus – Organ of Corti
187. Photopigment present in rods is
- (1) Rhodopsin (2) Iodopsin
 - (3) Erythropsin (4) Chloropsin
188. Choose the **correct** statement w.r.t human brain.
- (1) Cerebellum is the largest part of brain.
 - (2) Cerebrum is a structural constituent of brain stem.
 - (3) Optic lobes are present in forebrain.
 - (4) Iter is present in midbrain.
189. Catecholamines are associated with all the following **except**
- (1) Pupillary dilation (2) Hypertension
 - (3) Proteolysis (4) Glycogenesis
190. Which of the following set of hormones bind with receptors present on plasma membrane?
- (1) FSH, estrogen
 - (2) Androgen, progesterone
 - (3) Adrenaline, glucagon
 - (4) Thyroxine, secretin
191. How many hormones given in the box are released from pituitary gland?
- LH, ACTH, TSH, Oxytocin, ADH, GHIH, PRL
- (1) Four (2) Five
 - (3) Six (4) Three
192. Generally, myoglobin and haemoglobin respectively exist in which of the following structures of protein?
- (1) Primary and secondary
 - (2) Secondary and tertiary
 - (3) Tertiary and quaternary
 - (4) Secondary and quaternary
193. If in a DNA fragment, the number of deoxyadenylic acid and deoxycytidylic acid is 25 and 30 respectively, then calculate the total number of nucleotides in the same DNA fragment.
- (1) 55 (2) 110
 - (3) 220 (4) 90
194. Total lung capacity can't be represented by
- (1) TV + IRV + ERV + RV
 - (2) IC + ERV + RV
 - (3) EC + IRV + RV
 - (4) IC + EC + FRC
195. Nucleases acts on
- (1) Nucleic acids in basic medium
 - (2) Nucleotides in basic medium
 - (3) Nucleosides in basic medium
 - (4) Both nucleic acids and nucleotides
196. The example of choline containing phospholipid is
- (1) Palmitic acid
 - (2) Lecithin
 - (3) Hexacosyl palmitate
 - (4) Cholesterol
197. Lactational amenorrhea occurs due to high levels of _____ hormone.
- Choose the option that fills the blank correctly.
- (1) FSH (2) LH
 - (3) Prolactin (4) Estrogen
198. At present about 900 restriction enzymes have been isolated from over 230 strains of bacteria, each of which recognises different recognition sequences. In *EcoRI* the letter 'R' is derived from the name of
- (1) Scientist who discovered the enzyme
 - (2) Strain of *E.coli*
 - (3) Genus name
 - (4) Species name
199. The number of bones in digits of right hand is equal to the number of bones in
- (1) Cranium
 - (2) Facial region
 - (3) Vertebral column
 - (4) Carpals of left hand
200. Complete the analogy.
- Menstrual cycle : Humans : : Oestrus cycle : ____
- (1) Apes (2) Monkeys
 - (3) Dogs (4) Chimpanzees



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