HARVIN ACADEMY

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A PREMIER INSTITUTE OF NEET

HFT/11/Droppers/22	720	3 hrs. 20 mts
Test Code	Max. Marks	Time Allowed

Important Instructions:

1. The test is of 3 hours 20 mts duration and test booklet contains 200 multiple choice questions (four options in each subject are divided into two sections (A and B) as per detail given below.
   (a) **Section A** shall consist of 35 (Thirty Five) Questions in each subjects (Q.1 to 35, Q.51 to 85, Q.101 to 135 and Q.151 to 185). All questions are compulsory.
   (b) **Section B** shall consist of 15 (Fifteen) questions in each subject (Q. 36 to 50, Q.86 to 100, Q.136 to 150 and Q.186 to 200). In Section B, a candidate needs to attempt any 10 (Ten) questions out of 15 (Fifteen) in each subject.
2. Each question is followed by four alternatives as suggested answers. Mark the most appropriate alternative as your answer in the space provided in the OMR sheet.
3. Only one alternative is to be selected. Any cutting, overwriting, multiple responses will be treated as an incorrect response and will be awarded one negative mark.
5. Any indiscipline / use of unfair means in the Examination Hall will lead to disqualification of the candidate.
6. Use of white fluid for correction and use of electronic/manual calculator is prohibited.
8. The candidates are allowed to take away this test-booklet with them but must submit the OMR sheet before leaving the Examination Hall.
9. Use Blue/Black Ball Point Pen only for writing particulars on this page/marking responses.

Test Syllabus

Physics :	XII Full Syllabus
Chemistry :	XII Full Syllabus
Botany :	XII Full Syllabus
Zoology :	XII Full Syllabus

Name of the Candidate (in Capitals) : _____

Roll Number (In figures) : _____

Centre of Examination (in Capitals) : _____

Date of Examination : _____

Candidate's Signature : _____ Invigilator's Signature : _____

PHYSICS

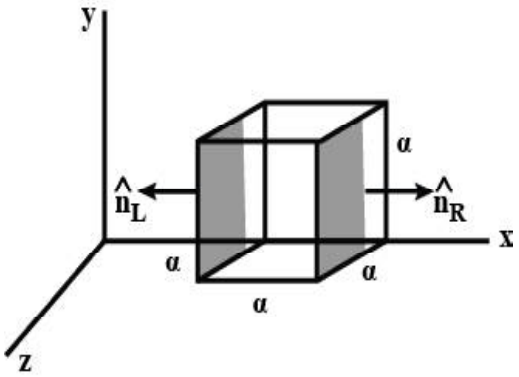
SECTION - A

1. **Four charges equal to $-Q$ are placed at the four corners of a square and a charge q is placed at its centre. If the system is in equilibrium, the value of q is**

1. $-\frac{Q}{4}\left(1+2\sqrt{2}\right)$ 2. $\frac{Q}{4}\left(1+2\sqrt{2}\right)$

3. $-\frac{Q}{2}\left(1+2\sqrt{2}\right)$ 4. $\frac{Q}{2}\left(1+2\sqrt{2}\right)$

2. **The electric field components in the given figure are $E_x = \alpha x^{1/2}$, $E_y = E_z = 0$ in which $\alpha = 800$ $NC^{-1}m^{-1/2}$. The charge within the cube is, if net flux through the cube is 1.05 Nm^2C^{-1} (assume a = 0.1m)**



1. 9.27×10^{-12} C 2. 9.27×10^{12} C
3. 6.97×10^{-12} C 4. 6.97×10^{12} C

3. **A simple pendulum has a length l, mass of bob m. The bob is given a charge q coulomb. The pendulum is suspended between the vertical plates of the charged parallel plate capacitor. If E is the field strength between the plates, then time period of the pendulum is given by**

1. $2\pi\sqrt{\frac{l}{g}}$ 2. $2\pi\sqrt{\frac{l}{\sqrt{g+\frac{qE}{m}}}}$

3. $2\pi\sqrt{\frac{l}{\sqrt{g-\frac{qE}{m}}}}$ 4. $2\pi\sqrt{\frac{l}{\sqrt{g^2+\left(\frac{qE}{m}\right)^2}}}$

4. **A slab of material of dielectric constant K has the same area as the plates of a parallel capacitor, but has a thickness (3/4)d, where d is the separation of the plates. How is the capacitance changed when the slab is inserted between the plates?**

1. $\frac{4K}{K+3}C_0$ 2. $\frac{K+3}{4K}C_0$

3. $\frac{K-3}{4K}C_0$ 4. $\frac{4K}{K-3}C_0$

5. **The potential energy of a charged parallel plate capacitor is U_0. If a slab of dielectric constant K is inserted between the plates, then the new potential energy will be**

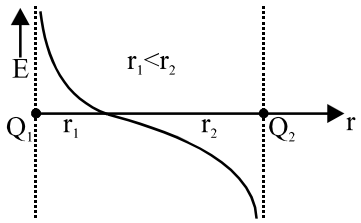
1. $\frac{U_0}{K}$ 2. U_0K^2

3. $\frac{U_0}{K^2}$ 4. U_0^2K

6. **To get maximum current through a resistance of 2.5Ω, one can use m rows of cells, each row having n cells. The internal resistance of each cell is 0.5Ω. What are the value of m and n, if the total number of cells is 20?**

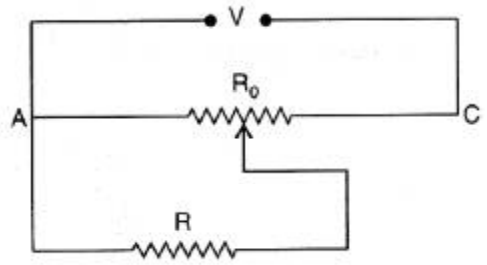
1. m = 2, n = 10 2. m = 4, n = 5
3. m = 5, n = 4 4. n = 2, m = 10

7. **The variation of electric field between two point charges along the line joining the charges is given in figure. Then which is/are correct ?**



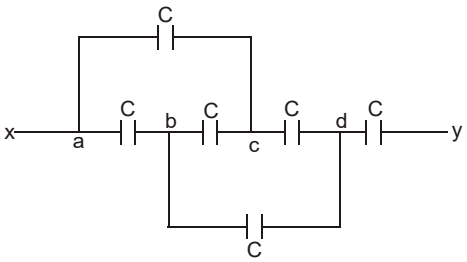
1. Q_1 is +ve and Q_2 is –ve
2. Q_1 is +ve and Q_2 is +ve
3. $|Q_1| < |Q_2|$
4. $|Q_1| > |Q_2|$

8. A resistance of RΩ draws current from a potentiometer. Potentiometer has a total resistance $R_0\Omega$ as shown in figure. A voltage V is supplied to the potentiometer. Derive an expression for the voltage across R when the sliding contact is in the middle of the potentiometer.



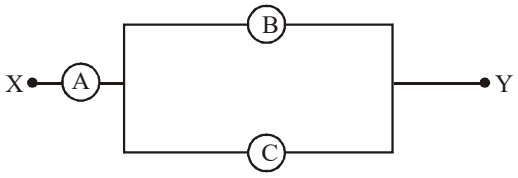
1. $\frac{2VR}{R_0+4R}$ 2. $\frac{2VR}{R_0}$
3. $\frac{4VR}{R_0+2R}$ 4. $\frac{VR}{R_0+2R}$

9. Find equivalent capacitance between X and Y if each capacitor is 4 μF.



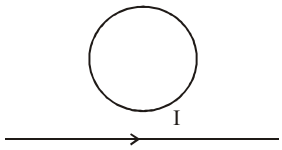
1. 4 μF 2. 8 μF
3. 12 μF 4. 1 μF

10. Three voltmeters A, B and C having resistances R, 1.5 R and 3R, respectively, are connected as shown. When come potential difference is applied between X and Y, the voltmeter readings are V_A, V_B and V_C respectively. Then –



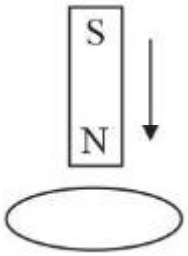
1. $V_A \neq V_B = V_C$ 2. $V_A = V_B \neq V_C$
3. $V_A \neq V_B \neq V_C$ 4. $V_A = V_B = V_C$

11. A current-carrying wire is placed below a coil in its plane, with current flowing as shown. If the current increases –



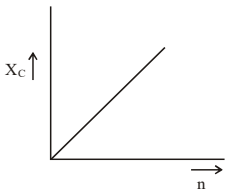
1. no current will be induced in the coil
2. an anticlockwise current will be induced in the coil
3. a clockwise current will be induced in the coil
4. the current induced in the coil will be first anticlockwise and then clockwise

12. The North pole of a magnet is falling on a metallic ring as shown in the figure. The direction of induced current, if looked from upside in the ring will be

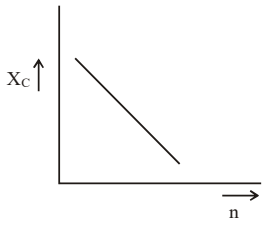


1. clockwise or anti-clockwise depending on metal of the ring
2. no induced current
3. anti-clockwise
4. clockwise

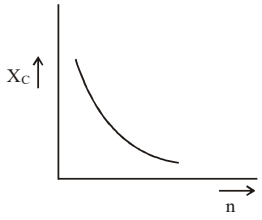
13. Which of the following curves correctly the variation of capacitive reactance (X_c) with frequency n –

1. 

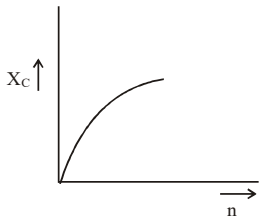
2.



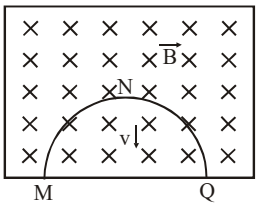
3.



4.

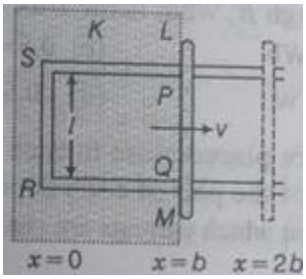


14. A thin semi-circular conducting ring of radius R is falling with its plane vertical in a horizontal magnetic induction $\vec{B}$ (see figure). At the position MNQ the speed of the ring is v and the potential difference developed across the ring is



1. zero
2. $Bv\pi R^2/2$ and M is at higher potential
3. πRBv and Q is at higher potential
4. 2RBv and Q is at higher potential.

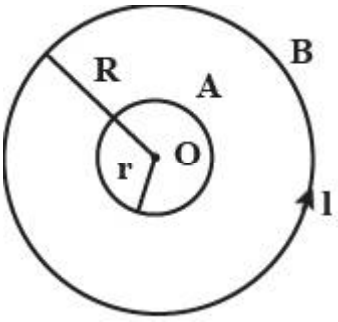
15. Refer to figure, the arm *PQ* of the rectangular conductor is moved from $x = 0$, outwards. The uniform magnetic field is perpendicular to the plane and extends from $x = 0$ to $x = b$ and is zero for $x > b$. Only the arm *PQ* possesses substantial resistance *r*. Consider the situation when the arm *PQ* is pulled outwards from $x = 0$ to $x = 2b$ and is then moved back to $x = 0$ with constant speed *v*.



In the above question, find the force necessary (x = 0 to x = b motion, x = b to x = 2b motion) to pull the arm and the power dissipated as joule heat.

1. Force $\frac{B^2l^2v}{r}, 0$; Power $\frac{B^2l^2v^2}{r}, 0$
2. Force $\frac{B^2l^2v^2}{r}, \frac{B^2l^2v^2}{r}$; Power $\frac{B^2lv}{r}, \frac{B^2l^2v}{r}$
3. Force $\frac{Blv}{2v}, \frac{B^2l^2v^2}{2r}$; Power $\frac{B^2l^2v}{4r}, \frac{B^2l^2}{4r}z$
4. Force $\frac{Blv}{4r}, \frac{Blv}{2r}$; Power $\frac{B^2l^2v^2}{4r}, \frac{B^2l^2v^2}{4r}$

16. *O* is the centre of two coplanar concentric circular conductors, *A* and *B*, of radii r and *R* respectively as shown in the figure. Here $r <<< R$. The mutual inductance of the system of the conductors can be given by :



1. $\frac{\mu_0 \pi r^2}{2R}$ 2. $\frac{\mu_0 \pi R^2}{2r}$

3. $\frac{\pi R^2}{\mu_0 r}$ 4. $\frac{\mu_0 \pi r}{2R}$

17. In AC circuit, I = 100 sin 200πt. **The time requirred for the current to achieve its peak value will be**

1. $\frac{1}{100}$ s 2. $\frac{1}{200}$ s

3. $\frac{1}{300}$ s 4. $\frac{1}{400}$ s

18. **An alternating current is given by the equation $i = i_1 \cos \omega t + i_2 \sin \omega t$. The rms current is given by**

1. $\frac{1}{\sqrt{2}}(i_1 + i_2)$ 2. $\frac{1}{\sqrt{2}}(i_1 + i_2)^2$

3. $\frac{1}{\sqrt{2}}\left(i_1^2 + i_2^2\right)^{1/2}$ 4. $\frac{1}{2}\left(i_1^2 + i_2^2\right)^{1/2}$

19. **Which of the following components of a L-C-R circuit with AC supply, do not dissipates energy?**

1. L, C 2. R, C

3. L, R 4. L, C, R

20. **If ε_0 and μ_0 are, respectively, the electric permittivity and magnetic permeability of free space ε and μ are the corresponding quantities in a medium, the index of refraction of the medium in terms of the above parameters is**

1. $\frac{\varepsilon\mu}{\varepsilon_0\mu_0}$ 2. $\left(\frac{\varepsilon\mu}{\varepsilon_0\mu_0}\right)^{1/2}$

3. $\left(\frac{\varepsilon_0\mu_0}{\varepsilon\mu}\right)$ 4. $\left(\frac{\varepsilon_0\mu_0}{\varepsilon\mu}\right)^{1/2}$

21. **The electric field associated with an electro magnetic wave in vaccume is given by**

$E = i\ 40 \cos (kz - 6 \times 10^8 t)$, where E, z and t are in V m^{-1}, meter and second respectively. the value of wave vector k is

1. 2 m^{-1} 2. 0.5 m^{-1}

3. 6 m^{-1} 4. 3 m^{-1}

22. **The magnetic field of a beam emerging from a filter facing a flood light as given**

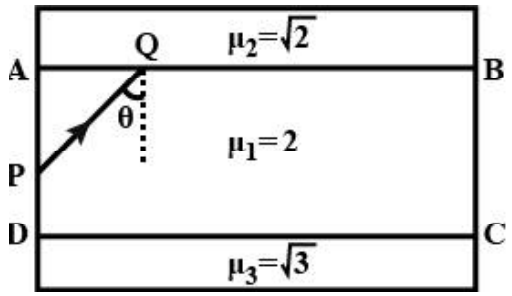
$B_0 = 12 \times 10^{-8} \sin (1.20 \times 10^7 z - 3.6 \times 10^{15} t)$

What is the average intensity of the beam?

1. 1.91 Wm^{-2} 2. 1.71 Wm^{-2}

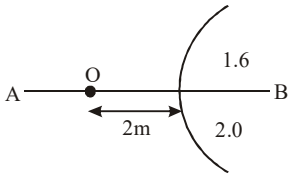
3. 200 Wm^{-2} 4. 1.5 Wm^{-2}

23. **A parallel sides slab ABCD of refractive index 2 is sandwiched between two slabs of refractive indices $\sqrt{2}$ and $\sqrt{3}$ as shown in the figure. The minimum value of angle such that the ray PQ suffers total internal reflection at both the surfaces AB and CD is**



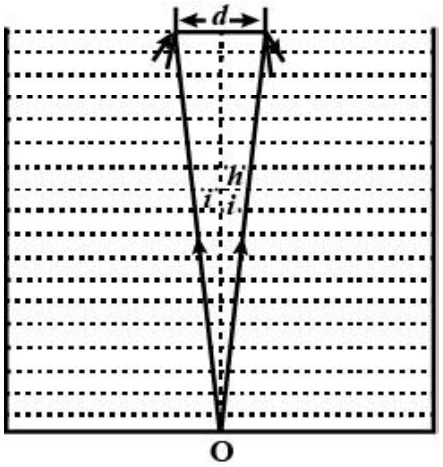
1. 30° 2. 45°
3. 60° 4. 75°

24. **In the figure shown a point object O is placed in air. A spherical boundary separates two media. AB is principal axis. The refractive index above AB is 1.6 and below AB is 2.0. The separation between the images formed due to refraction at spherical surface is –**



1. 12m 2. 20m
3. 14m 4. 10m

25. A jar of height h is filled wih a transparent liquid of refractive index μ, Fig. At the centre of the jar on the botom surface is a dot. Find the minimum diameter of a disc, such that when placed on the top surface symmetrically about the centre, the dot is invisible.



1. $\frac{2h}{\sqrt{\mu^2-1}}$ 2. $\frac{h}{\sqrt{\mu^2-1}}$

3. $\frac{h}{2\sqrt{\mu^2-1}}$ 4. $\frac{2\sqrt{\mu^2-1}}{h}$

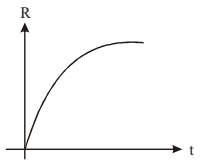
26. Two slits in Young's double slit experiment have width in ratio 1 : 25. The ratio of intensity at the maxima and minima in the interference pattern, I_{max}/I_{min} is

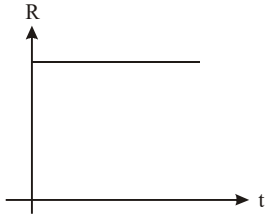
1. 9/4 2. 121/49
3. 49/121 4. 4/9

27. In Young's double-slit experiment, the intensity of light at a point on the screen (where the path difference is λ) is *K*, (λ being the wavelength of light used). The intensity at a point where the path difference is λ/4 will be

1. K 2. K/4
3. K/2 4. zero

28. A radioactive nucleus X decays to a stable nucleus 'Y'. Then the graph of rate of formation of 'Y' against time 't' will be –

1.


2.


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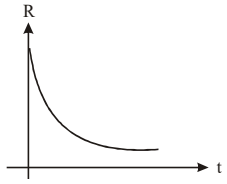

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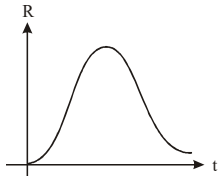


29. $A \xrightarrow{\lambda} B \xrightarrow{2\lambda} C$

t=0	N_0	0	0
t	N_1	N_2	N_3

The ratio of N_1 to N_2 when N_2 is maximum is –

1. at no time this is possible
2. 2
3. 1/2
4. $\frac{\ln 2}{2}$

30. A particle is dropped from a height H. The de-Broglie wavelength associated with particle is proprtional to

1. H 2. $H^{1/2}$
3. H^0 4. $H^{-1/2}$

31. An electron (mass m) with an initial velocity $v = v_0\hat{i}(v_0 > 0)$ is in an electrical field $E = E_0\hat{i}(E_0 > 0)$ field. It's de-Broglie wavelength at time *t* is given by

1. $\dfrac{\lambda_0}{\left(1+\dfrac{eE_0}{m}\dfrac{t}{v_0}\right)}$ 2. $\lambda_0\left(1+\dfrac{eE_0t}{mv_0}\right)$

3. λ_0 4. $\lambda_0 t$

32. In pfund series, ratio of maxmimum to minimum wavelength of emmited spectral lines is

1. $\dfrac{\lambda_{max}}{\lambda_{min}}=\dfrac{4}{3}$ 2. $\dfrac{\lambda_{max}}{\lambda_{min}}=\dfrac{9}{5}$

3. $\dfrac{\lambda_{max}}{\lambda_{min}}=\dfrac{16}{7}$ 4. $\dfrac{\lambda_{max}}{\lambda_{min}}=\dfrac{36}{11}$

33. The ratio of speed of an electron in ground state in Bohr's first orbit of hydrogen atom to the velocity of light in air is

1. $\dfrac{e^2}{2\pi hc}$ 2. $\dfrac{2\pi e}{hc}$

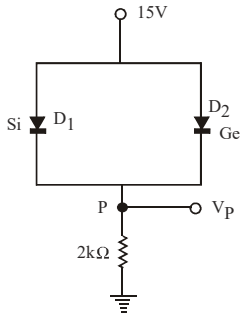
3. $\dfrac{e^3}{2\pi hc}$ 4. $\dfrac{2\pi e^2}{hc}$

34. A radioactive isotope has a half life of T years. It reduces to 3.125% of its original value in

1. 2T 2. 3T

3. 5T 4. 15T

35. What is the voltage across 2kΩ shown in figure.



1. 14.7V 2. 12.7V

3. 21.2V 4. 4.8V

PHYSICS

SECTION - B

36. Two small spheres each having charge +Q are suspended by insulating threads of length L from a hook. this arrangement is taken to a space where there is no gravitational effect, then the angle between the two threads and the tension in each will be

1. $180^\circ, \dfrac{1}{4\pi\varepsilon_0}\dfrac{Q^2}{(2L)^2}$

2. $90^\circ, \dfrac{1}{4\pi\varepsilon_0}\dfrac{Q^2}{L^2}$

3. $180^\circ, \dfrac{1}{4\pi\varepsilon_0}\dfrac{Q^2}{2L^2}$

4. $180^\circ, \dfrac{1}{4\pi\varepsilon_0}\dfrac{Q^2}{L^2}$

37. Two capacitors C_1 and C_2 are charged to 120 V and 200 V respectively. It is found that by connecting them together the potential on each one can be made zero. Then,

1. $5C_1 = 3C_2$ 2. $3C_1 = 5\ C_2$

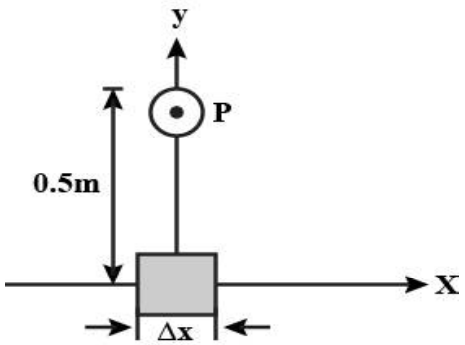
3. $3C_1 + 5C_2 = 0$ 4. $9C_1 = 4C_2$

38. There are two concentric spheres of radius (a) and (b) respectively. If the space between them is filled with medium of resistivity ρ, then the resistance of the inter gap between the two spheres will be:

1. $\dfrac{\rho}{4\pi(b+a)}$ 2. $\dfrac{\rho}{4\pi}\left(\dfrac{1}{b}-\dfrac{1}{a}\right)$

3. $\dfrac{\rho}{4\pi}\left(\dfrac{1}{a^2}-\dfrac{1}{b^2}\right)$ 4. $\dfrac{\rho}{4\pi}\left(\dfrac{1}{a}-\dfrac{1}{b}\right)$

39. An Element $\Delta I = \Delta x\hat{i}$ is placed at the origin and carries a currrent I = 10A. IF $\Delta x = 1cm$, magnetic field at point P is



1. $4\times10^{-8}\hat{k}T$ 2. $4\times10^{-8}\hat{i}T$

3. $4\times10^{-8}\hat{j}T$ 4. $-4\times10^{-8}\hat{j}T$

40. The length of a potentiometer wire is ℓ. A cell of emf E is balanced at a length $\ell/3$ from the positive end of the wire. If the length of the wire is increased by $\ell/2$. At what distance will be the same cell give a balance point.

1. $2\ell/3$ 2. $\ell/2$

3. $\ell/6$ 4. $4\ell/3$

41. In a circuit, L, C and R are connected in series with an alternating voltage source of frequency *f*. The current leads the voltage by 45°. The value of C is

1. $\dfrac{1}{2\pi f\left(2\pi fL+R\right)}$

2. $\dfrac{1}{\pi f\left(2\pi fL+R\right)}$

3. $\dfrac{1}{2\pi f\left(2\pi fL-R\right)}$

4. $\dfrac{1}{\pi f\left(2\pi fL-R\right)}$

42. The charge on a parallel plate capacitor is varying as $q = q_0 \sin 2\pi ft$. The plates are very large and close together (Area = *A*, separation = *d*). Neglecting edge effects, the displacement current through the capacitor is

1. $\dfrac{d}{A\varepsilon_0}$ 2. $\dfrac{d}{\varepsilon_0}\sin 2\pi ft$

3. $2\pi fq_0\cos 2\pi ft$ 4. $\dfrac{2\pi fq_0}{\varepsilon_0}\cos 2\pi ft$

43. In Young's Double Slit Experiment intensity at a point is (1/4) of the maximum intensity. Angular position of this point is

1. $\sin^{-1}\left(\lambda/d\right)$ 2. $\sin^{-1}\left(\lambda/2d\right)$

3. $\sin^{-1}\left(\lambda/3d\right)$ 4. $\sin^{-1}\left(\lambda/4d\right)$

44. Two identical photocathodes receive light of frequencies v_1 and v_2. If the velocities of the photoelectrons (of mass m) coming out are v1 and v_2, respectively, then

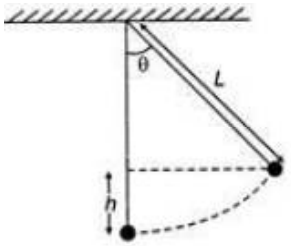
1. $v_1^2-v_2^2=\dfrac{2h}{m}\left(v_1-v_2\right)$

2. $v_1-v_2=\left[\dfrac{2h}{m}\left(v_1+v_2\right)\right]^{1/2}$

3. $v_1^2-v_2^2=\dfrac{2h}{m}\left(v_1+v_2\right)$

4. $v_1-v_2=\left[\dfrac{2h}{m}\left(v_1-v_2\right)\right]^{1/2}$

45. A simple pendulum with bob of mass *m* and conducting wire of length *L* swings under gravity through an angle θ. The earth's magnetic field component in the direction perpendicular to swing is *B*.The maximum potential difference induced across the pendulum is:



1. $2BL\sin\frac{\theta}{2}(gL)^{1/2}$

2. $BL\sin\left(\frac{\theta}{2}\right)(gL)$

3. $BL\sin\left(\frac{\theta}{2}\right)(gL)^{3/2}$

4. $BL\sin\left(\frac{\theta}{2}\right)(gL)^{2}$

46. Obtain the amount of $^{60}_{27}Co$ necessary to provide aradioactive source of 8.0 mCi strength. The half life of $^{60}_{27}Co$ is 5.3 yr.

1. 7.12×10^{-6} g
2. 1.2×10^{-5} g
3. 1.58×10^{-6} g
4. 3.5×10^{-5} g

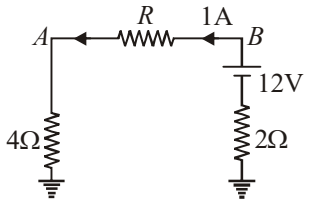
47. The magnetic field at the center of a circular current carrying conductor of radius *r* is B_c. The magnetic field on its axis at a distance r from the center is B_a. The value of B_c : B_a will be

1. $1:\sqrt{2}$
2. $1:2\sqrt{2}$
3. $2\sqrt{2}:1$
4. $\sqrt{2}:1$

48. A closed-loop moves normal to the constant electric field between the plates of a large capacitor. Is the current induced in the loop when it is wholly inside the region between the capcitor plates?

1. Yes
2. No
3. May be possible
4. May not be possible

49. In the circuit shown



1. R = 8 ohms
2. R = 6 ohms
3. R = 10 ohms
4. Potential difference between A and B is 2V

50. A galvanometer of resistance 100Ω gives a full scale deflection for a current of 10^{-5} amp. To convert it in to an ammeter capable of measuring up to one ampere, the shunt resistance should be

1. 10^{-5} Ω
2. 0.001 Ω
3. 0.01 Ω
4. 1 Ω

CHEMISTRY

SECTION - A

51. How many crystal systems have only primitive unit cell?

1. 1
2. 2
3. 3
4. 4

52. The number of Na^+ ions and Cl^- ions (part or full) required to form one unit cell of NaCl, respectively, are

1. 4 and 4
2. 13 and 14
3. 14 and 13
4. 6 and 6

53. When sodium chloride crystal is heated in sodium metal vapors then it gives the appearance of yellow color. It is due to

1. F - center defect
2. Anion deficiency defect
3. Metal excess defect
4. All of the above

54. Which, of the following, solutions has the highest freezing point?

1. 1 M Urea solution
2. 1 M KCl solution
3. 1 M MgC_2 solution
4. All have the same freezing point

55. A mixture of ethanol and water shows a positive deviation from Raoult's law. This mixture also forms an azeotropic mixture. The boiling point of this azeotropic mixture will be

1. Less than the boiling point of water but more than the boiling point of ethanol

2. More than the boiling point of water but less than the boiling point of ethanol
3. More than the boiling point of ethanol as well as water
4. Less than the boiling point of ethanol as well as water

56. We have two compartments A and B and both are separated by a semipermeable membrane. In compartment A, 0.01 M Na_2SO_4 solution is present and in compartment B, 0.02 M $BaCl_2$ solution is present. The precipitate of $BaSO_4$ will be formed in

1. Compartment A
2. Compartment B
3. No precipitate is formed in any compartment
4. Both Compartment A & B

57. Aqueous NaCl solution is electrolysed using platinum electrodes. The incorrect statement regarding this electrolysis is

1. pH of solution increases
2. Cl_2 gas is evolved at the anode
3. H_2 gas is evolved at the cathode
4. pH of solution remains unchanged

58. The feasible reaction, amongst the following, is

1. $2KCl + Br_2 \rightarrow 2KBr + Cl_2$
2. $2KF + I_2 \rightarrow 2KI + F_2$
3. $2KClO_3 + I_2 \rightarrow 2KIO_3 + Cl_2$
4. $2KIO_3 + Cl_2 \rightarrow 2KClO_3 + I_2$

59. The number of Faradays required for the deposition of 127 gram copper in copper sulphate solution is (Atomic weight of copper = 63.5)

1. 1 F
2. 2 F
3. 3 F
4. 4 F

60. The temperature coefficient of a reaction is 2.5. How many times the rate of reaction increases when temperature increases from 10°C to 40°C?

1. 6.25 times
2. 7.5 times
3. 15.625 times
4. 39.0625 times

61. For an exothermic reaction, the value of ΔH will be

1. More than E_a
2. Less than E_a
3. Equal to E_a
4. All of the above

62. In a reaction, when the concentration of a reactant increases two times then the half-life period of reactant decreases two times. The order of the reaction will be

1. 0
2. 1
3. 2
4. 3

63. The incorrect statement regarding chemical adsorption is

1. It is unilayered
2. On increasing the pressure, chemical adsorption increases
3. On increasing the temperature, chemical adsorption decreases
4. Heat of adsorption is high i.e. 40 - 400 kJ /Mole

64. Bredig's Arc method is used for the preparation of metallic sol. It is

1. Dispersion method
2. Condensation method
3. Dispersion as well as condensation method
4. Neither dispersion nor condensation method

65. When $KMnO_4$ is reacted with oxalic acid in presence of dilute H_2SO_4 then decolourisation of $KMnO_4$ takes place. In this reaction, the autocatalyst is

1. Mn^{2+}
2. SO_4^{2-}
3. CO_2
4. K^+

66. Which, of the following, is not a sulphide ore?

1. Chalcopyrite
2. Argentite
3. Calamine
4. Iron Pyrite

67. The slag formed in the metallurgy of copper is

1. $CuSiO_3$
2. $CaSiO_3$
3. $FeSiO_3$
4. $MgSiO_3$

68. In Ellingham diagram, which conversion has a negative slope when a graph is plotted in between ΔG and T?

1. $C \rightarrow CO_2$
2. $Mg \rightarrow MgO$
3. $C \rightarrow CO$
4. $Al \rightarrow Al_2O_3$

69. NO_2 is the anhydride of

1. HNO_3 2. HNO_2
3. $HNO_3 + HNO_2$ 4. HNO_5

70. When NH_3 is reacted with excess of Cl_2, then a compound of nitrogen is formed. The compound formed is

1. NCl_3 (explosive solid)
2. NCl_3 (explosive liquid)
3. NH_4Cl (solid)
4. NH_4Cl (liquid)

71. Which of the following is not a neutral oxide?

1. NO 2. NO_2
3. N_2O 4. CO

72. The hybridised state of Xe and shape of $XeOF_4$, respectively, will be

1. sp^3d and square pyramidal
2. sp^3d^2 and octahedral
3. sp^3d^2 and square pyramidal
4. sp^3d and trigonal bipyramidal

73. When $K_2Cr_2O_7$ is reacted with $SnCl_2$ in presence of HCl, then the reduced product of $K_2Cr_2O_7$ and oxidized product of $SnCl_2$, respectively, are

1. $[CrCl_4]^-$ and Cl_2 2. $CrCl_3$ and Cl_2
3. $CrCl_3$ and $SnCl_4$ 4. $CrCl_6$ and $SnCl_4$

74. When AgBr is reacted with $Na_2S_2O_3$ (hypo), a soluble complex is formed. This soluble complex is

1. $[Ag(S_2O_3)]^-$
2. $[Ag(S_2O_3)_2]^{3-}$
3. $[Ag(S_2O_3)_3]^{5-}$
4. None of the above

75. Assertion (A): Eu^{2+} behaves as a reducing agent

Reason (R): +3 oxidation state of lanthanoids are more common

1. Both assertion and reason are true and the reason is the correct explanation of the assertion
2. Both assertion and reason are true but the reason is not the correct explanation of the assertion
3. Assertion is true but reason is false
4. Both assertion and reason are false

76. The heterobidentate ligand, amongst the following, is

1. en(ethylenediammine)
2. ox (oxalato)
3. gly (glycinato)
4. All of the above

77. $[Pt(en)_2Cl_2]$ can show optical as well as geometrical isomerism. The total number of isomers of $[Pt(en)_2Cl_2]$ will be

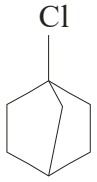
1. 2 2. 3
3. 4 4. 5

78. In which of the following complexes, central atom has sp^3 hybridisation?

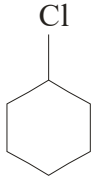
1. $[PtCl_4]^{2-}$ 2. $[Ni(CN_4)]^{2-}$
3. $[Cu(NH_3)_4]^{2+}$ 4. None of these

79. The complex that does not follow EAN (Effective atomic number) rule is

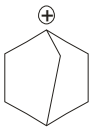
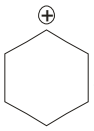
1. $K_4[Fe(CN)_6]$ 2. $[Ni(CO)_4]$
3. $[NiCl_4]^{2-}$ 4. $[Fe(CO)_5]$

80. Assertion (A): 

is more reactive than



towards nucleophilic substitution reaction.

Reason (R):  **is more stable than**  .

1. Both assertion and reason are true and the reason is the correct explanation of the assertion
2. Both assertion and reason are true but the reason is not the correct explanation of the assertion
3. Assertion is true but reason is false
4. Both assertion and reason are false

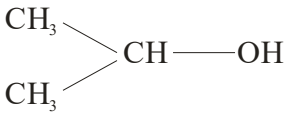
81. When 2-bromobutane is reacted with potassium tertiary butoxide, then the major product and reaction mechanism involved, respectively, are

1. But-1-ene, E1
2. But-2-ene, E2
3. But-1-ene, E2
4. But-1-ene, E1

82. When alkyl halide is reacted with AgCN, then alkyl isocyanide is formed as a major product. The reason for this reaction is

1. AgCN is an electrovalent compound
2. AgCN is a covalent compound
3. In cyanide ion, nitrogen is more nucleophilic
4. Alkyl isocyanide is more stable than alkyl cyanide

83. Primary alcohol, amongst the following, is

1. $CH_3 - OH$
2. $CH_3 - CH_2 - OH$
3. 
4. Both (1) and (2)

84. Ether cannot be dry up to dryness due to fear of explosion. It is due to the formation of

1. Superoxide
2. Peroxide
3. Oxide
4. Alcohols

85. The most acidic compound, amongst the following, is

1. p-nitrophenol
2. o-nitrophenol
3. o-cresol
4. m-nitrophenol

CHEMISTRY
SECTION - B

86. In Luca's test of alcohols, the intermediate formed is

1. Carbocation
2. Carbanion
3. Free Radical
4. No intermediate

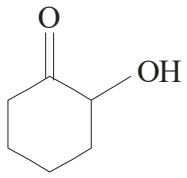
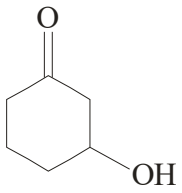
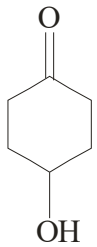
87. When the mixture of calcium formate and calcium acetate is dry distillate then the carbonyl compound formed is

1. Formaldehyde
2. Acetaldehyde
3. Acetone
4. All of these

88. When HCHO and C_6H_5CHO are reacted in presence of 50% NaOH, then the products formed are

1. HCOONa and C_6H_5COONa
2. CH_3OH and $C_6H_5CH_2OH$
3. HCOONa and $C_6H_5CH_2OH$
4. CH_3OH and C_6H_5COONa

89. Which, of the following compounds, is readily dehydrated on heating?

1. 
2. 
3. 
4. All, of the above, are equally dehydrated

90. Which, of the following, acid derivatives is reduced by $NaBH_4$?

1. CH_3COCl
2. $(CH_3CO)_2O$
3. $CH_3COOC_2H_5$
4. None of the above

91. The intermediate formed in Hoffmann's Bromamide reaction is

1. Carbene
2. Nitrene
3. Benzyne
4. Carbocation

92. Which amine gives liquid compound with diethyl oxalate?

1. $CH_3—CH_2—NH_2$
2. $(CH_3)_2NH$
3. $(CH_3)_3NH$
4. $CH_3—NH_2$

93. From which of the following reactions, aniline can't be formed?

1. Schmidt Reaction
2. Hoffmann's Bromamide reaction
3. Mendius reaction
4. None of the above

94. When nitrobenzene is reduced in the presence of AsO_3 / NaOH, then the product formed is

1. Phenyl hydroxyl amine
2. Azoxybenzene
3. Azobenzene
4. Hydrazobenzene

95. When glucose is reduced with red phosphorous and HI, then n-hexane is formed. This reaction shows that glucose has

1. a ring structure
2. a linear chain of six carbon atoms
3. five –OH groups
4. –CHO group

96. The non reducing sugar, amongst the following, is

1. Glucose 2. Fructose
3. Sucrose 4. Mannose

97. Low density polythene (LDPE) is formed at

1. Low pressure 2. Moderate pressure
3. High pressure 4. Pressure has no role

98. Which of the following polymer is formed by Cationic polymerisation?

1. Polythene 2. PVC
3. Teflon 4. Polypropylene

99. Asprin is used as an

1. Analgesic
2. Antipyretic
3. Analgesic as well as Antipyretic
4. Antiseptic

100. When salicylic acid is reacted with CH_3OH in presence of concentrated then the drug formed is

1. Methyl Salicylate
2. Oil of wintergreen
3. Both 1 and 2
4. Salol

BOTANY

SECTION - A

101. Aleurone layer is a part of:

1. Cotyledons 2. Endosperm
3. Embryo 4. Seed coat

102. Gas released during Bhopal tragedy was

1. Sodium isothiocyanate
2. Potassium isothiocyanate
3. Ethyl isothiocyanate
4. Methyl isocyanate

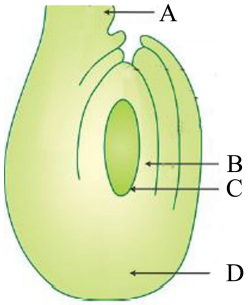
103. In the treatment of sewage, which of the following is mainly a microbial process?

1. Primary treatment
2. Secondary Treatment
3. Tertiary treatment
4. Both (1) and 2.

104. When plant diversity is maintained in natural habitat the conservation is called

1. *In vivo* 2. *In vitro*
3. *Ex situ* 4. *In situ*

105. In the following diagram A, B, C and D represent respectively :



1. Micropyle, Testa, Nucellus, Chalaza
2. Funicle, Testa, Tegmen, Chalaza
3. Funicle, Nucellus, Embryo sac, Chalaza
4. Funicle, Embryo sac, Nuclellus, Chalaza

106. Which one of the following is the definition of ecosystem?

1. A localized association of several plants and animals
2. Different communities of plants, animals and microbes together with their surrounding environments
3. Different communities of plants and microbes, plus their physicochemical environments
4. A community of organisms interacting with one another

107. The pyramid of biomass is inverted in

1. Pond ecosystem 2. Grassland ecosystem
3. Forest ecosystem 4. All the above

108. Which of the following elements has only the sedimentary type of nutrient cycle?

1. Carbon 2. Hydrogen
3. Nitrogen 4. Phosphorus

109. Ten percent law of energy transfer in a food chain was enunciated by

1. Lindeman 2. Haeckel
3. Schimper 4. Odum

110. Which of the following is not apomixis ?

1. Layering
2. Grafting
3. Development of embryo from nucellus inside seed in mango
4. Fusion between micro and mega gametes

111. In a grazing food chain with three trophic levels, if the biomass of grass is 1000 kg, the primary carnivore biomass shall be

1. 100 kg 2. 10 kg
3. 200 kg 4. 1 kg

112. Which is the most stable ecosystem?

1. Desert 2. Mountain
3. Ocean 4. Forest

113. Which of the following is related with entry of pollen tube in to the embryo sac?

1. Filiform apparatus 2. Synergid
3. Inositol 4. All of these

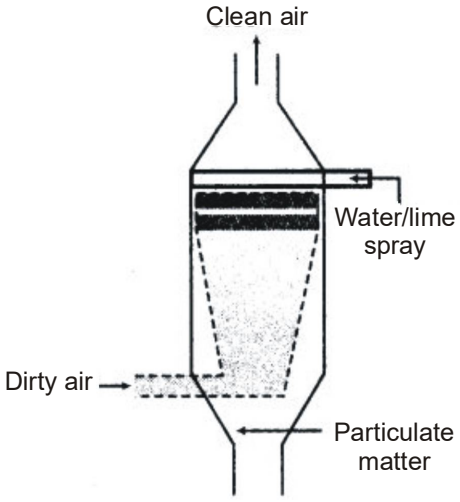
114. Endothecium is the—

1. Outer layer of microsporangia
2. Middle layer of microsporangia
3. Inner layer of microsporangia
4. All of these

115. Minimum how many meiosis are required to produce 100 seeds in wheat?

1. 25 2. 100
3. 125 4. 200

116.



1. Electrostatic precipitator
2. Scrubber
3. Cyclonic collector
4. Catalytic converter

117. In a type of apomixis known as adventive embryony, embyos develop directly from the

1. Nucellus or integuments
2. Zygote
3. Synergids or antipodals in an embryo sac
4. Accessory embryo sacs in the ovule

118. Which of the following used as biological control agent?

1. *Nucleopolyhedrovirus*
2. *Trichoderma*
3. *Bacillus thuringiensis*
4. All of these

119. "Clot buster" is obtained from

1. *Trichoderma* 2. *Streptococcus*
3. *Clostridium* 4. *Acetobacter*

120. Cyclosporin-A-is produced by

1. *Trichoderma polysporum*
2. *Aspergillus niger*
3. *Cercospora personatea*
4. *Microsporum*

121. Primary succession refers to the development of communities on a:

1. Pond, freshly filled with water after a dry phase
2. Freshly cleared crop field
3. Newly exposed habitat with no record of earlier vegetation
4. Forest clearing after devastating fire

122. Which one of the following pairs is a sedimentary type of biogeochemical cycle?

1. Oxygen and nitrogen
2. Phosphorus and sulphur
3. Phosphorus and carbondioxide
4. Phosphorus and nitrogen

123. The stratospheric ozone depletion leads to:

1. Global warming
2. Increase in the incidence of skin cancer
3. Forest fires
4. Sound pollution

124. A community that starts the process of succession in a habitat is called:

1. Pioneer community
2. Abiotic community
3. Biotic community
4. None of these

125. "Catalytic converter" is used in automobiles:

1. For removing the poisonous lead
2. For converting CO and harmful hydrocarbons into. CO_2
3. For removing water
4. None of the above

126. Cleistogamay is found:

1. *Commelina* 2. *Vallisnaria*
3. Sunflower 4. *Bombax*

127. World environment day is:

1. 5 June 2. 14 November
3. 2 October 4. 28 February

128. Vegetation of Delhi is:

1. Hydrophytic 2. Mesophytic
3. Halophytic 4. Hygrophytic

129. Individuals of the same species inhabiting in a particular locality constitute:

1. Population 2. Community
3. Flora 4. Fauna

130. The gaseous exchange in land plants occur through stomata. How do submerged hydrophytes exchange gases?

1. Through lenticels
2. Through stomata
3. Through hydathodes
4. Through general surface by diffusion

131. Dense evergreen vegetation of broad sclerophyllous leaves and shrubs with the fire resistant resinous plants is known as:

1. Chaparral vegetation
2. Savannah vegetation
3. Steppes grassland
4. Tundra vegetation

132. Biomass of producers within specified area will be maximum in:

1. Forest ecosystem 2. Grassland ecosystem
3. Pond ecosystem 4. Lake ecosystem

133. If a recombinant DNA bearing gene for ampicillin resistance is transferred into *E.coli* cells and the host cells are spread on agar plates containing ampicillin, then

1. both transformed and untransformed recipient cells will be die
2. both transformed and untransformed recipient cells will grow
3. transformed recipient cells will grow and untransformed recipient cells will be die
4. transformed recipient cells will die and untransformed recipient cell will be grow

134. Plasmids are suitable vectors for gene cloning because

1. these are small circular DNA molecules, which can integrate with host chromosomal DNA
2. these are small circular DNA molecules with their own replication origin site
3. these can shuttle between prokaryotic and eukaryotic cells
4. these often carry antibiotic resistance genes

135. Given below are four statements pertaining to separation of DNA fragments using gel electrophoresis. Identify the incorrect statements.

I. DNA is negatively charged molecule and so it is loaded on gel towards the anode terminal.

II. DNA fragments travel along the surface of the gel whose concentration does not affect movement of DNA.

III. Smaller the size of DNA fragment larger is the distance it travels through it.

IV. Pure DNA can be visualised directly by exposing UV- radiation.

Select the correct option from the following

1. I,III and IV 2. I,II and III
3. II,III and IV 4. I, II and IV

BOTANY

SECTION - B

136. In the atmosphere, the CO_2 concentration at present is about

1. 31 ppm 2. 0.030 ppm
3. 0.3 ppm 4. 360 ppm

137. The ecology of individual organisms of species is called

1. Synecology 2. Autecology
3. Habitat ecology 4. Population ecology

138. When a big fish eats a small fish, which eats water fleas supported by phytoplankton, the water fleas are

1. Primary consumers
2. Secondary consumers
3. Top consumer in this food chain
4. Producers

139. What is biome?

1. That part of the Earth and its atmosphere, where living organisms are present
2. A complex of communities interacting with one another
3. The flora on land
4. A large ecological unit characterized by distinct life forms, delimited by set of climatic conditions

140. Fertilization in *Casuarina* and *Cucurbita* occurs through—

1. Porogamy, Mesogamy
2. Chalazogamy, Mesogamy
3. Porogamy, Chalazogamy
4. Mesogamy, Chalazogamy

141. In many flowers there are often certain adaptations of the floral parts which act as obstructions to self pollination and thus favour cross pollination by insects. Such contrivance is called

1. Herkogamy 2. Dichogamy
3. Self-sterility 4. Dicliny

142. In Coconut, the central cavity full of coconut water is the

1. Original embryo sac vacuole while the nuclei around it form the peripheral endosperm kernel
2. Liquid endosperm only
3. Cellular endosperm
4. All of these

143. Flocs are

1. Masses of fungi
2. Masses of bacteria associated with green plants
3. Mass of bacteria
4. Masses of bacteria associated with fungal filament

144. Parbhani kranti is the resistance variety of

1. *Triticum* 2. *Abelmoschus*
3. *Brassica* 4. *Nicotiana*

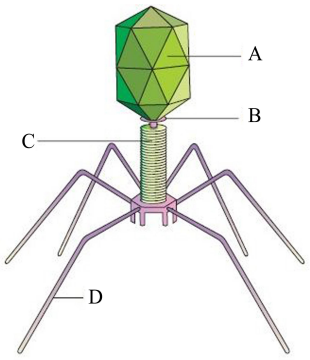
145. If we completely remove the decomposers from an ecosystem, the ecosystem functioning will be adversely affected because:

1. Herbivores will not receive solar energy
2. Rate of decomposition of other components will be very high
3. Mineral movement will be blocked
4. Energy flow will be blocked

146. In recent years there has been an increasing incidence of floods in the plains of northern India because:

1. There has been an increase in annual rainfall
2. The rate of silting of dams has gone up
3. There has been increased deforestation in the catchment areas
4. Increased areas of land is being self-cultivated

147. In the diagram given below structure containing genetic material and structure responsible for attachment are:



1. A and C 2. C and D
3. A and C 4. A and D

148. Male gametes are formed by:

1. Vegetative cell
2. Generative cell
3. Megaspere mother cell
4. Synergids

149. A selectable marker is used to

1. help in eliminating the non- transformants, so that the transformants can be regenerated
2. identify the gene for a desired trait in an alien organism
3. select a suitable vector for transformation in a specific crop
4. mark a gene on a chromosome for isolation using restriction enzyme

150. The first recombinant DNA was constructed by linking an antibiotic resistant gene with the native plasmid of

1. *Escherichia coli*
2. *Salmonella typhimurium*
3. *Clostridium butylicum*
4. *Acetobacter aceti*

ZOOLOGY

SECTION - A

151. During which stage of the menstrual cycle does the endometrium of the uterus regenerate through proliferation? [Page 50]

1. Menstrual 2. Follicular
3. Ovulatory 4. Luteal

152. A completely curable STD amongst the following would be: [Page 63]

1. Hepatitis B 2. Genital herpes
3. HIV infections 4. Syphilis

153. Which of the following would lead to deviation from Hardy-Weinberg equilibrium? [Page 137]

1. Random mating
2. Lack of mutations
3. No gene flow or gene migration
4. Natural selection

154. Opportunistic infections appear in AIDS patients when the HIV has destroyed: [Page 156]

1. Macrophages 2. T cytotoxic cells
3. T helper cells 4. B cells

155. What limitation of traditional hybridization used for plant and animal breeding has been overcome by the use of rDNA techniques?

1. High cost **[Page 194]**
2. Insertion of undesirable genes
3. Complexity of the procedure
4. Antigenicity of the product

156. Which of the following is the correct sequence of the paired-duct system for passage of spermatozoa during emission?

1. epididymides, ductus deferentia, and ejaculatory ducts
2. epididymides, ejaculatory ducts, and ductus deferentia
3. ductus deferentia, epididymides, and ejaculatory ducts
4. ductus deferentia, ejaculatory ducts, and epididymides

157. The interstitial cells (cells of Leydig)

1. nourish spermatids
2. produce testosterone
3. produce spermatozoa
4. secrete alkaline fluid

158. Which of these events is NOT correctly matched with the time when it occurs?

1. beginning of menses - day 1
2. ovulation - day 14
3. LH surge - day 21
4. beginning of proliferative phase - day 5

159. Which of the following is secreted only during the luteal phase of a menstrual cycle?

1. LH 2. FSH
3. estrogen 4. progesterone

160. Bacterial DNA is not cleaved by their own restriction enzymes because bacteria add _____ to their own DNA.

1. nucleotides 2. peptides
3. methyl groups 4. somototropin

161. In genetic engineering, DNA ligase is used as:

1. a probe
2. a sealing enzyme
3. a restriction enzyme
4. a mutagen

162. Which one of the following populations would most quickly lead to two groups with few shared traits?

1. a population with disruptive selection
2. a population with directional selection
3. a population with stabilizing selection
4. a population with no selection

163. What holds together the four polypeptide chains of an antibody?

1. disulfide bonds 2. light chains
3. heavy chains 4. complement proteins

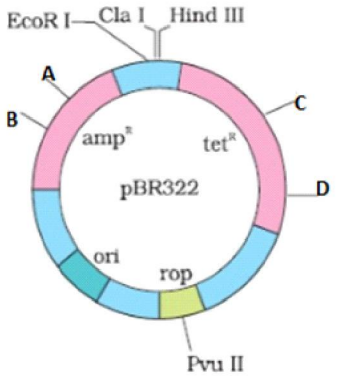
164. The flippers of penguins and dolphins are:

1. Analogous structures **[Page 131]**
2. Homologous structures
3. Vestigial structures
4. Atrophied structures

165. All the following are edible marine water fishes except: [Page 169]

1. *Hilsa* 2. *Catla*
3. Sardines 4. Pomfrets

166. In the given diagram of the plasmid pBR322, the restriction site of BamH I is represented by the letter: [Page 199]



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

167. The best breeding method for animals that are below average in productivity in milk production is: [Page 168]

1. Inbreeding
2. Out crossing
3. Cross breeding
4. Inter-specific hybridization

168. In males, breast enlargement, premature baldness and enlargement of the prostate gland may be the result of the abuse of: [Page 162]

1. Alcohol 2. Nicotine
3. Anabolic steroids 4. Diuretics

169. Ideal contraceptives for the females who want to delay pregnancy and/or space children are: [Page 61]

1. Barrier contraceptives
2. IUDs
3. OCPs
4. Sterilization

170. Which of the following can lead to sterility in human males? [Page 48]

1. A sperm count of 1 million per ml of semen
2. Only about 80 % sperms showing normal morphology
3. Only about 60 % sperms showing vigorous motility
4. Descent of testis before birth

171. The two key concepts of Darwinian theory of evolution are: [Page 134]

1. Saltation and Natural selection
2. Inheritance of acquired traits and Natural selection
3. Branching descent and Natural selection
4. Discontinuous variation and Survival of the fittest

172. Which lymphoid organ also has a large reservoir of erythrocytes? [Page 154]

1. Thymus 2. Lymph nodes
3. Spleen 4. Cisterna chyli

173. *Hisardale*, a new breed of sheep, has been produced by: [Page 168]

1. In breeding
2. Out crossing
3. Cross breeding
4. Inter-specific hybridization

174. A recombinant protein is produced by: [Page 203]

1. Post-translation modification and alternative splicing of the propeptide
2. Expression of a protein coding gene in a hetrologous host
3. Post-transcription modification and alternative splicing of the pre-mRNA
4. Artificial synthesis of a polypeptide in a template independent manner

175. RNAi interference takes place in: [Page 209]

1. All organisms
2. All prokaryotic organisms
3. Only in plants
4. All eukaryotic organisms

176. A permanent cure for alpha-1-antitrypsin deficiency would be: [Page 211]

1. Bone marrow transplantation
2. Enzyme replacement therapy
3. Introducing the gene isolate from marrow cells producing ADA into cells at early embryonic stages
4. Introducing the gene isolate from marrow cells producing ADA into peripheral lymphocytes

177. In MOET technology, to induce follicular maturation and super ovulation, the cow is administered hormones with activity like: [Page 168]

1. FSH
2. LH
3. Estrogen
4. Progesterone

178. Alpha interferons used in treatment of cancer: [Page 158]

1. protect normal cells from radiations used to kill tumor cells
2. act as biological response modifiers
3. protect tumor cells from infection by viruses
4. increase the efficiency of the chemotherapy used to kill tumor cells

179. Which of the following probably ate meat? [Page 141]

1. *Dryopithecus*
2. *Australopithecine*
3. *Homo habilis*
4. *Homo erectus*

180. The Government of India legalized MTP in: [Page 62]

1. 1951
2. 1961
3. 1971
4. 1981

181. In a human fetus which of the following will be seen before the first trimester of the pregnancy? [Page 54]

1. Appearance of hair on the head
2. First movements of the fetus
3. Fetus develops limbs and digits
4. Separation of eyelids

182. The fetal ejection reflex triggers the release of: [Page 54]

1. Prolactin by the maternal pituitary
2. Progesterone by the placenta
3. Estrogen by the placenta
4. Oxytocin by the maternal pituitary

183. When more than one adaptive radiation appeared to have occurred in an isolated geographical area [representing different habitats], one can call this as: [Page 133]

1. Parallelism
2. Saltation
3. Convergent evolution
4. Divergent evolution

184. Ringworm can be caused by all the following genera of fungi except: [Page 149]

1. *Microsporum*
2. *Trichoderma*
3. *Trichophyton*
4. *Epidermophyton*

185. All the following are true regarding HIV infection in humans except: [Page 156]

1. HIV is a retrovirus that lacks an envelope
2. There is always a time-lag between the infection and appearance of AIDS symptoms
3. The macrophages act like a HIV factory.
4. AIDS has no cure

ZOOLOGY

SECTION - B

186. Periodic abstinence is a natural method of contraception where the couples avoid or abstain from coitus during the period of the menstrual cycle when: [Page 59]

1. There is menstrual flow
2. The ovulation is most likely to occur
3. The corpus luteum is most active
4. The proliferative phase begins

187. Which of the following is not a pre-condition needed to be present in a protobiont if it could be the precursor of the first life on Earth? [Page 43 O]

1. Complete isolation from the environment
2. Capability of replication
3. Ability to transducer energy
4. Scope of slow changes

188. Malignant tertian malaria is caused by: [Page 147]

1. *Plasmodium ovale*
2. *Plasmodium vivax*
3. *Plasmodium falciparum*
4. *Plasmodium malariae*

189. The recombinant hepatitis B vaccine is produced from: [Page 152]

1. *Escherechia coli*
2. Yeast
3. *Arabidopsis thaliana*
4. *Drosophila melanogaster*

190. A nonfunctional CD4 protein on a helper cell would result in the helper T cell being unable to:

1. Respond to T independent antigens
2. Lyse a tumor cell
3. Stimulate a cytotoxic T cell
4. Interact with MHC II antigens

191. Which genetically engineered is used in scavenging of oil spills by digesting hydrocarbons of crude oils? [Page 267 O]

1. *Rhizobium melliloti*
2. *Pseudomonas inflorescence*
3. *Psuedomonas putida*
4. *Escherechia coli*

192. To protect tobacco plants against *Meloidegyne incognita* using RNAi, nematode specific genes were introduced in the plant using: [Page 209]

1. Transposons
2. Retrotransposons
3. Virus with RNA genome
4. *Agrobacterium*

193. The cause of menses in the menstrual cycle is

1. increased progesterone production from the ovary, which produces blood clotting.
2. increased estrogen secretion from the ovary, which stimulates the muscles of the uterus to contract.
3. decreased progesterone and estrogen secretion by the ovary.
4. decreased production of oxytocin, causing the muscles of the uterus to relax.

194. Which of the following is the correct sequence for the development and regression of an ovarian follicle?

1. primordial follicle, mature vesicular ovarian follicle, corpus albicans, and corpus luteum
2. primordial follicle, mature vesicular ovarian follicle, corpus luteum, and corpus albicans
3. primordial follicle, corpus luteum, corpus albicans, and mature vesicular ovarian follicle
4. primordial follicle, corpus luteum, mature vesicular ovarian follicle, and corpus albicans

195. Sickle-cell trait in humans is a classic example of:

1. how mutations can lead only to tragic outcomes
2. why outbreeding is important
3. the superior fitness seen in heterozygotes
4. how every organism is an integrated gene complex

196. Which statement most accurately reflects what population geneticists refer to as "fitness"?

1. Fitness is the measure of an organism's adaptability to various habitats.
2. Fitness reflects the number of mates each individual of the population selects.
3. Fitness refers to the relative health of each individual in the population.
4. Fitness is a measure of the contribution of a genotype to the gene pool of the next generation.

197. The current demographic profile of India is characterized by a rapid decline in all the following except: [Page 59]

1. Death rate
2. Maternal mortality rate
3. Infant mortality rate
4. Population growth rate

198. In difference to the therapeutic products isolated from non-human sources, recombinant therapeutics: [Page 210]

1. are much cheaper
2. less effective
3. are not antigenic
4. cannot be mass produced

199. The extinct group of reptiles from which the mammals evolved is: [Page 139]

1. Pelycosaurs
2. Therapsids
3. Thecodonts
4. Sauropsids

200. When, due to natural selection, more individuals acquire the mean character value, the type of natural selection is termed as: [Page 137]

1. Stabilizing
2. Directional
3. Disruptive
4. Catastrophic