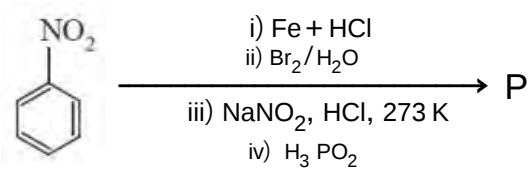
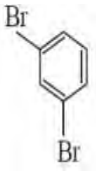
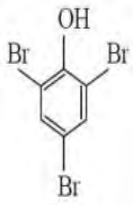
Previous Paper Questions

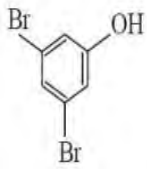
1. Q.Id: 159471

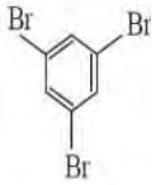
What is the product 'P' in the following sequence of reactions ?



A) 

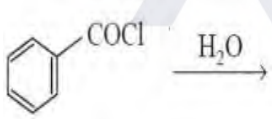
B) 

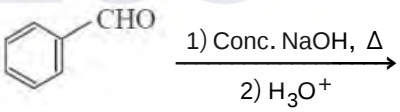
C) 

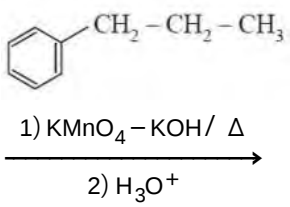
D) 

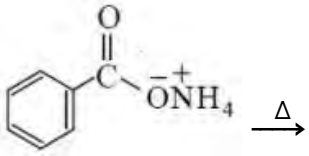
2. Q.Id: 159470

Which one of the following reaction can not produce benzoic acid ?

A) 

B) 

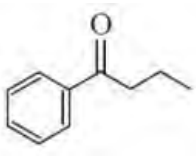
C) 

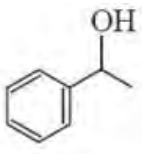
D) 

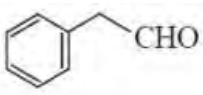
3. Q.Id: 159468

Which one among the below gives an iodoform test ?

A) 

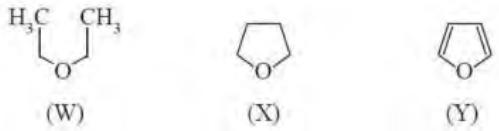
B) 

C) 

D) 

4. Q.Id: 159467

The correct order of basicity of oxygen atoms present in the compounds W, X and Y is,



(W) (X) (Y)

A) Y > X > W

B) W > X > Y

C) X > W > Y

D) X > Y > W

5. Q.Id: 159466

Find the correct variation for the following compounds with reference to their bond length and bond energy respectively.

I) CH_3-F

II) CH_3-Cl

III) CH_3-Br

IV) CH_3-I

A) I < II < III < IV, I > II > III > IV

B) I > II > III > IV, I > II > III > IV

C) I < II < III < IV, I < II < III < IV

D) I > II > III > IV, I < II < III < IV

6. Q.Id: 159465

Statement (a) : Antiseptics kill or prevent the growth of microorganisms and are harmful to human tissues.

Statement (b) : Tincture of iodine is an antiseptic.

The correct answer is

A) Both (a) and (b) are correct.

B) Both (a) and (b) are not correct.

C) (a) is correct but (b) is not correct.

D) (a) is not correct but (b) is correct.

7. Q.Id: 159464

Which of the following statements are correct for amino acids ?

A) Amino acids form Zwitter ions.

B) All naturally occuring amino acids have D-configuration.

C) Complete hydrolysis of proteins leads to the formation of amino acids.

D) Allα - amino acids are opticallyactive.

A) A, C

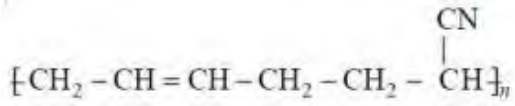
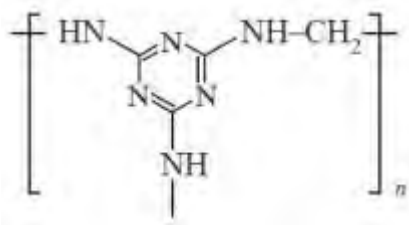
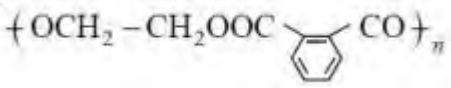
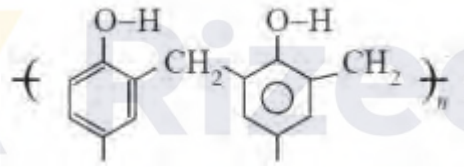
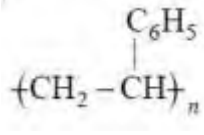
B) B, D

C) A, B, C

D) A, B, D

8. Q.Id: 159462

Match the following.

List1	List2
A. Melamine	I. 
B. Glyptal	II. 
C. Bakelite	III. 
D. Buna-N	IV. 
E. .	V. 

A) A-> IV, B-> II, C-> III, D-> V

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

C) A-> V, B-> II, C-> III, D-> I

D) A-> II, B-> I, C-> IV, D-> V

9. Q.Id: 159460

The formula for the compound Hexa ammine Chromium (III) - tetrachlorocuprate (II) is

A) $\left[Cr(NH_3)_6\right]_3\left[CuCl_4\right]_2$

B) $Cr(NH_3)_6\,CuCl_4$

C) $\left[Cr(NH_3)_6\right]_2\left[CuCl_4\right]_3$

D) $Cr(NH_3)_{12}\,CuCl_{12}$

10. Q.Id: 159459

Match the following.

List - I (Substance/ion/Molecule)

List - II (Shape/ Magnetic character colour)

List1	**List2**
A. Manganate ion	I. Bond angle 126^o
B. Permanganate ion	II. Covalent green
C. Dichromate	III. Paramagnetic
D. Mn_2O_7	IV. Diamagnetic
E. .	V. Tetrahedral

A) A-> I, B-> III, C-> IV, D-> II **B)** A-> IV, B-> III, C-> II, D-> I

C) A-> III, B-> IV, C-> II, D-> I **D)** A-> III, B-> IV, C-> I, D-> II

11. Q.Id: 159457

Which of the following compounds undergo disproportionation reaction ?

a) H_3PO_3

b) H_3PO_2

c) $H_4P_2O_6$

d) H_3PO_4

A) a, d **B)** a, c, d

C) a, b, d **D)** a, b, c

12. Q.Id: 159456

What is the formula of the compound /ion formed on adding Fe^{2+} solution to nitrates in the presence of conc. H_2SO_4 ?

A) $Fe(SO_4)_2$ **B)** $\left[Fe(H_2O)_6\right]^{2+}$

C) $FeCl_3$ **D)** $\left[Fe(H_2O)_5(NO)\right]^{2+}$

13. Q.Id: 159454

Which of the following gases is responsible for making blistered copper ?

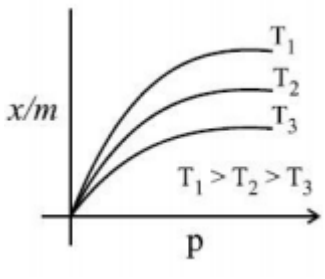
A) CO **B)** CO_2

C) SO_2 **D)** SO_3

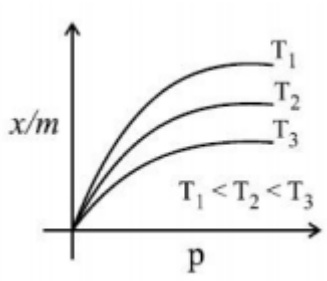
14. Q.Id: 159451

Which of the following correctly represent (s) Fruendlich adsorption isotherm ?

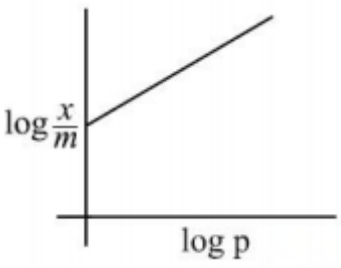
a)



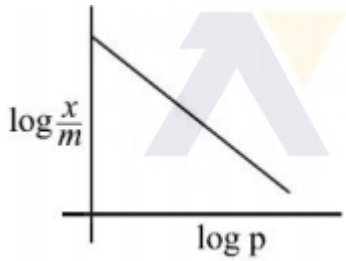
b)



c)



d)



A) a, d

B) a

C) a, c

D) b, c

15. Q.Id: 159449

In a reaction, $X + Y \rightarrow$ Product, the rate of the reaction changes from 1×10^{-3} mol $L^{-1}s^{-1}$ to 2×10^{-3} mol $L^{-1}s^{-1}$ when the concentration of Y is doubled. The rate of the reaction reaches 8×10^{-3} mol $L^{-1}s^{-1}$ when the concentration of both X and Y are doubled. The rate law for the reaction can be written as,

A) Rate = $k[X][Y]^2$

B) Rate = $k[X]^2[Y]$

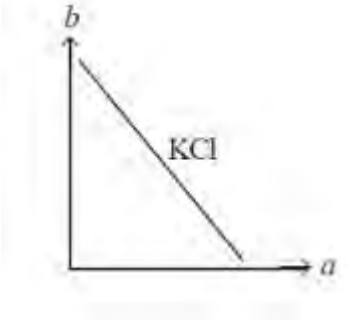
C) Rate = $k[X]^2[Y]^2$

D) Rate = $k[X]^3[Y]^1$

16. Q.Id: 159448

The correct unit of the slope given in the following plot for the strong electrolyte is :

(a = (concentration)$^{\frac{1}{2}}$, b = molar conductivity of solution)



A) $\frac{S\,cm^2\,mol}{(mol\,L^{-1})^{\frac{1}{2}}}$

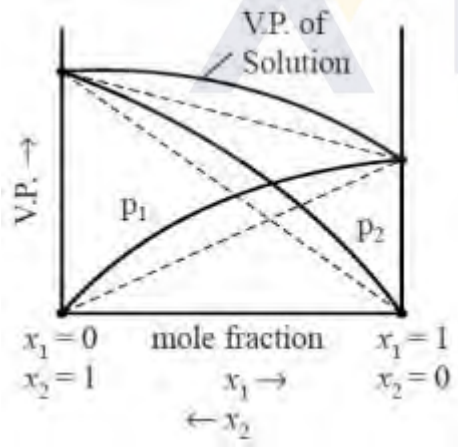
B) $\frac{S\,cm^2\,L^{-1}}{(mol\,L)^{\frac{1}{2}}}$

C) $\frac{S\,cm^2\,mol^{-1}}{(mol\,L^{-1})^{\frac{1}{2}}}$

D) $\frac{S\,cm^2\,mol^{-2}}{(mol\,L^{-1})^2}$

17. Q.Id: 159446

A plot of Vapour Pressure (V.P.) of two component system versus composition is given below. The correct pair of x_1 and x_2 is :



A) $x_1 = n-C_6H_{14}\,;\, x_2 = n-C_7H_{16}$

B) $x_1 = C_6H_6\,;\, x_2 = C_6H_5-CH_3$

C) $x_1 = CHCl_3\,;\, x_2 = CH_3COCH_3$

D) $x_1 = C_2H_5OH\,;\, x_2 = CH_3COCH_3$

18. Q.Id: 159443

The vapour pressures of pure heptane and pure octane are 92 and 31 torr, respectively at 40^o C. The total vapour pressure (in torr) of a solution containing 1.00 mole of heptane and 4.00 moles of octane is

A) 18.4

B) 24.8

C) 43.2

D) 51.2

19. Q.Id: 159442

Match the following.

List1	List2
A. Polar molecular solids	I. Positive ions in a sea of delocalized electrons
B. Ionic solids	II. Covalent bonding
C. Metallic solids	III. London forces
D. Network solids	IV. Dipole-dipole interaction
E. .	V. Coulombic or electrostatic interaction

A) A-> IV, B-> V, C-> I, D-> II

B) A-> III, B-> V, C-> I, D-> II

C) A-> III, B-> I, C-> V, D-> IV

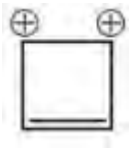
D) A-> V, B-> IV, C-> III, D-> I

20. Q.Id: 159440

Which of the following system are aromatic ?

A) 

B) 

C) 

D) 

A) A , B

B) A, C

C) A, D

D) B, D

21. Q.Id: 159429

The name of organic compound C_4H_6 that produces carbondioxide, ethanal and methanal upon treatment with O_3 followed by reduction with Zn/H_2O is

A) Buta-1, 3-diene

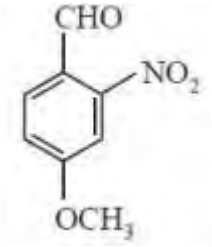
B) Buta-1, 2-diene

C) Cyclobutene

D) But-1-yne

22. Q.Id: 159428

The IUPAC name of the following compound is



A) 4-formyl-3-nitroanisole

B) 3-nitro-anisole-4-al

C) 3-methoxy-2-formyl nitrobenzene

D) 4-methoxy-2-nitrobenzaldehyde

23. Q.Id: 159426

Match the following.

List1	**List2**
A. Particulate matter	I. Organic matter
B. Ozone hole	II. $NaClO_3$
C. Pathogen	III. Smoke
D. Chemical Oxygen Demand	IV. Water pollution
E. .	V. Chlorine free radical

A) A-> III, B-> V, C-> IV, D-> I

B) A-> III, B-> I, C-> IV, D-> V

C) A-> III, B-> I, C-> V, D-> IV

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

24. Q.Id: 159425

Assertion (A) : $SiCl_4$ **is soluble in water, but** CCl_4 **is not.**

Reason (R) : d orbitals of Si facilitate the reaction with H_2O

The correct answer is

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

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

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

D) Both (A) and (R) are incorrect.

25. Q.Id: 159423

What are X and Y respectively in the following reactions ?

$$X + H_2O \xleftarrow{O_2} \text{diborane} \xrightarrow{CO} Y$$

A) $H_3BO_3, B(CO)_6$

B) $H_3BO_3, 2BH_3 \cdot CO$

C) $B_2O_3, BH_3(CO)_4$

D) $B_2O_3, 2BH_3 \cdot CO$

26. Q.Id: 159421

Sodium nitrate decomposes upon heating to give sodium nitrite. What is/are the other product/products formed during this process ?

A) NO, O_2

B) NO_2, O_2

C) O_2

D) N_2, O_2

27. Q.Id: 159420

What is the formula of the ion formed, on addition of calgon to hard water

A) $[Na_4M P_6O_{18}]^{2-}$

B) $[Na_2M P_6O_{18}]^{2-}$

C) $[K_2M P_6O_{18}]^{2-}$

D) $[K_4M P_6O_{18}]^{2-}$

28. Q.Id: 159419

Calculate the pH at which $Mg(OH)_2$ **begins to precipitate from a solution of 0.1 M (**K_{sp} **of** $Mg(OH)_2 = 1.0 \times 10^{-11}$**, log 5 = 0.70)**

A) 9.0

B) 5.3

C) 10.0

D) 8.0

29. Q.Id: 159418

In which of the following reaction (s) : $K_c = K_p$?

i) $2\ NOBr_{(g)} \rightleftharpoons 2NO_{(g)} + Br_{2(g)}$

ii) $H_2O_{(g)} + C_{(s)} \rightleftharpoons CO_{(g)} + H_{2(g)}$

iii) $H_{2(g)} + I_{2(g)} \rightleftharpoons +2HI_{(g)}$

iv) $N_{2(g)} + 3H_{2(g)} \rightleftharpoons +2NH_{3(g)}$

A) (i), (ii)

B) (iii)

C) (iii), (i)

D) (ii), (iv)

30. Q.Id: 159415

Which of the following statements are correct for first law of thermodynamics ?

a) Energy can neither be created nor be destroyed, in an isolated system.

b) It is impossible to construct a perpetual motion machine.

c) The total energy of the system and surroundings is constant.

d) Internal energy of a system can not be increased by performing work on the system.

A) a, b, c

B) a, b, c, d

C) a, c, d

D) b, c, d

31. Q.Id: 159413

The label of a H_2SO_4 bottle shows 1.4 $g\ cm^{-3}$ as its density. Calculate the molar concentration (in M) of H_2SO_4. (Molar mass of $H_2SO_4 = 98\ g\ mol^{-1}$

A) 15.0

B) 14.0

C) 13.28

D) 14.28

32. Q.Id: 159412

Find the approximate amount of Pt (in g) in 1 g of $Mn_{0.95}\ Pt_{0.05}O_2$.

[Atomic weight of Mn, Pt and O are 55, 195.0 and 16 respectively]

A) 0.20

B) 0.15

C) 0.1

D) 0.25

33. Q.Id: 159410

For a van der Waals gas $a = 4.5\ \text{atm L}^2\text{mol}^{-2}$, $b = 0.9\ \text{L mol}^{-1}$

$(V_c = 3b;\ P_c = \frac{a}{27\,b^2};\ T_c = \frac{8a}{27bR};\ R = 0.0821\ \text{L atm K}^{-1}\text{mol}^{-1})$

Its critical constants T_c, P_c **and** V_c **respectively approximately**

A) 36, 0.4, 5.4

B) 2.7, 0.2, 18

C) 18, 0.2, 2.7

D) 273, 1, 22.4

34. Q.Id: 159409

Density of a gas at $27\ ^oC$ **is 5.46** gdm^{-3} **and the corresponding pressure is 4 bar. Find out the density gas (in** gdm^{-3}**) at STP.**

A) 6

B) 1

C) 3.0

D) 1.5

35. Q.Id: 159407

In which of the following molecules, the central atom has expanded octet ?

a) SCl_2

b) CO_2

c) PF_5

d) H_2SO_4

e) BCl_3

A) b, c, d

B) c, d

C) d, e

D) b, d, e

36. Q.Id: 159406

The type of chemical bonds present in $"CuSO_4 \cdot 5H_2O"$ **are**

A) Covalent ; Co-ordinate covalent

B) Ionic ; Covalent

C) Ionic ; Covalent ; Co-ordinate covalent

D) Ionic ; Covalent ; Co-ordinate covalent ; Hydrogen bond

37. Q.Id: 159401

The atomic number of the element Unnilquadium is

A) 102

B) 108

C) 114

D) 104

38. Q.Id: 159400

Which of the following represents the correct order of ionic radii ?

A) $Mg^{2+} < F^- < Na^+ < O^{2-} < N^{3-}$

B) $Mg^{2+} < Na^+ < O^{2-} < F^- < N^{3-}$

C) $Mg^{2+} < Na^+ < F^- < O^{2-} < N^{3-}$

D) $Mg^{2+} < F^- < Na^+ < N^{3-} < O^{2-}$

39. Q.Id: 159399

"No two electrons in an atom can have the same set of four quantum numbers". This statement is

A) Heisenberg's uncertainty principle

B) Particle -wave dualism of de Broglie

C) Schrodingers wave mechanics

D) Pauli exclusion principle

40. Q.Id: 159397

The amount of energy required for the conversion of H to H^+ is 13.6 eV. The amount of energy (in eV) required for the conversion of He^+ to He^{2+} is

A) 27.2

B) 40.8

C) 54.4

D) 81.6

41. Q.Id: 159392

The heights of the transmitting and receiving antenna respectively are h_1 and h_2.

The radio horizons of transmitting and receiving antenna respectively are 16 km and $8\sqrt{6}$ km.

Identify the correct option (Radius of the earth = 6400 km)

A) $h_1 = 20\,m, \frac{h_1}{h_2} = \frac{3}{2}$

B) $h_2 = 30\,m, \frac{h_1}{h_2} = \frac{2}{3}$

C) $h_1 = 30\,m, \frac{h_1}{h_2} = \frac{2}{3}$

D) $h_2 = 20\,m, \frac{h_1}{h_2} = \frac{3}{2}$

42. Q.Id: 159391

In a standard half wave rectifier circuit using pn junction diode, if the voltage in the secondary of the transformer is 12 V (a.c.), the average voltage (in V) output from the circuit is

A) $\frac{12}{\sqrt{2}\pi}$

B) $\frac{12}{\pi}$

C) $\frac{12\sqrt{2}}{\pi}$

D) $\frac{\pi}{6}\sqrt{2}$

43. Q.Id: 159390

For a transistor amplifier in CE configuration, the change in collector current and base current are 1.5 mA and $10\ \mu A$, respectively. If the collector load resistance $R_L = 10\ k\Omega$ and the input resistance $R_i = 2\ k\Omega$, the power gain of the amplifier is

A) 11250

B) 56250

C) 9000

D) 112500

44. Q.Id: 159389

In a decay process, given below, a nucleus X decays into a nucleus Y, a beta particle and an antineutrino. $X \rightarrow Y + e + \bar{\nu}$. If the atomic mass of X and Y are 175.942694 u and 175.941420 u respectively, then the maximum kinetic energy of beta particle will be closest to (Assume 1 u = $931\ MeV/c^2$)

A) 0.98 MeV

B) 1.42 MeV

C) 1.32 MeV

D) 1.18 MeV

45. Q.Id: 159388

Assertion (A) : As per Bohr's atomic theory, the electrons revolving around the nucleus do not radiate energy.

Reason (R) : The angular momentum of orbiting electron is quantized.

The correct answer is

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

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

C) Only (A) is true.

D) Only (R) is true.

46. Q.Id: 159387

A parallel beam of light is incident normally on a perfectly absorbing surface. If the force exerted by the light beam on the surface is 2×10^{-7} N in 10 nanoseconds, the energy of photons hitting the surface is

A) 600 nJ

B) 500 nJ

C) 400 nJ

D) 700 nJ

47. Q.Id: 159386

The electric field in an electromagnetic wave is given by $\vec{E} = E_0\hat{e}_z \sin(ky - \omega t)$ where $k = \hat{k}.\hat{e}_y$. The magnetic field is then given by ($\hat{e}_x$, $\hat{e}_y$, $\hat{e}_z$ are unit vectors along x, y and z direction and c is the speed of light)

A) $\vec{B} = \frac{+E_0}{c}(\sin(ky-\omega t)\hat{e}_x + \cos(ky-\omega t)\hat{e}_y)$

B) $\vec{B} = \frac{+E_0}{c}\hat{e}_x \sin(ky-\omega t)$

C) $\vec{B} = \frac{-E_0}{c}\hat{e}_z \sin(ky-\omega t)$

D) $\vec{B} = \frac{-E_0}{c}\hat{e}_y \sin(ky-\omega t)$

48. Q.Id: 159385

An inductor of inductance 0.2 H is connected in series with a resistance, a capacitance and an AC source of frequency $\frac{1}{\pi} \times 10^4 Hz$. For what value of capacitance, the current will be maximum in the circuit

A) 1.25×10^{-8} F

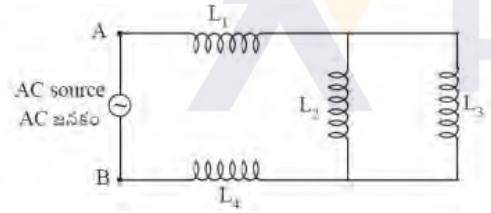
B) 6.5×10^{-9} F

C) 5.0×10^{-8} F

D) 3.0×10^{-9} F

49. Q.Id: 159384

Consider the inductor arrangement shown in figure. The equivalent inductance of the arrangement between the points A and B is



A) $(L_1 + L_4) - \left(\frac{L_2 L_3}{L_2 - L_3}\right)$

B) $\left(\frac{L_1 L_4}{L_1 - L_4}\right) + L_2 + L_3$

C) $(L_1 + L_4) + \left(\frac{L_2 L_3}{L_2 + L_3}\right)$

D) $L_1 + L_2 + L_3 + L_4$

50. Q.Id: 159383

Consider three coaxial cylinders of infinite length. The inner cylinder carries current of 3 A in the upward direction. The middle cylinder carries a current 5 A in the downward direction and the outer cylinder carries a current of 8 A in the upward direction. The magnitude of magnetic field 10 cm away from the common central axis of the three cylinders is

A) 6 μT

B) 12 μT

C) 15 μT

D) 17 μT

51. Q.Id: 159382

A galvanometer having a resistance of $8\ \Omega$ is shunted by a wire of resistance $2\ \Omega$. If the total current is 1 A, the part of it passing through the shunt will be

A) 1.2 A

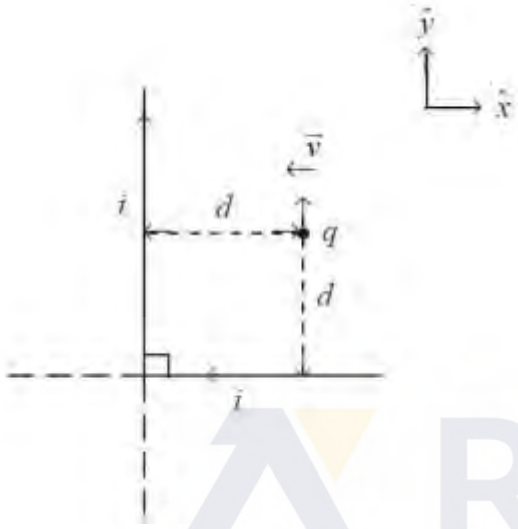
B) 0.8 A

C) 0.5 A

D) 0.3 A

52. Q.Id: 159381

Two infinitely long straight wires carry a current 'i' in the direction as shown in the figure. For a proton of charge q, a distance d away from the wires and moving with a velocity 'v' along $(-\hat{x})$ direction, the magnetic force on the proton is



A) $\frac{\mu_0 iq\,v}{2\pi d}\hat{y}$

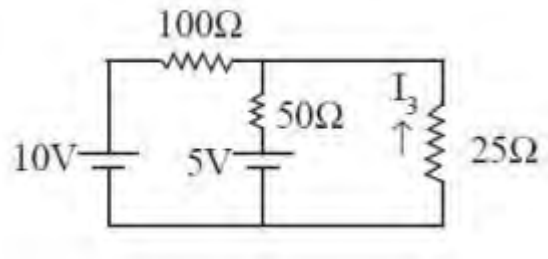
B) $-\left(\frac{\mu_0 iq\,v}{\pi d}\hat{y}\right)$

C) $\frac{\mu_0 iq\,v}{\sqrt{2}\pi d}$ into the plane of page

D) Zero

53. Q.Id: 159380

The current I_3 in the following circuit is



A) $\frac{-2}{35}$A

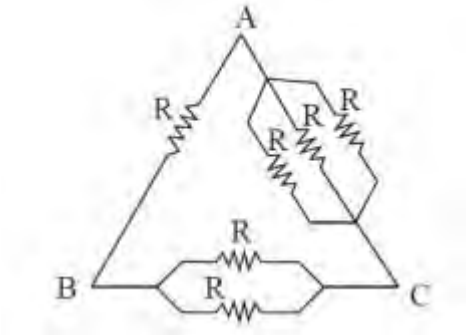
B) $\frac{4}{35}$A

C) $\frac{2}{35}$A

D) $-\frac{4}{35}$A

54. Q.Id: 159379

Six equal resistances are connected between the points A, B and C as shown in figure below. If R_{AB}, R_{AC} and R_{BC} are resistances between points A - B, A - C and B - C respectively, then correct option is



A) $R_{AB} > R_{AC} > R_{BC}$

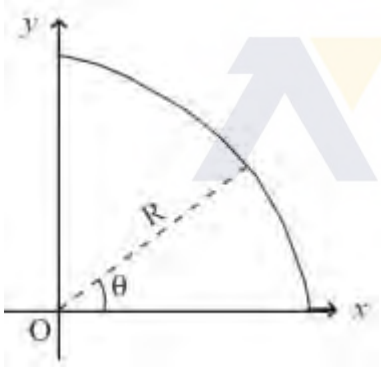
B) $R_{BC} > R_{AC} > R_{AB}$

C) $R_{AC} > R_{BC} > R_{AB}$

D) $R_{AB} > R_{BC} > R_{AC}$

55. Q.Id: 159378

A non conducting wire is in the form of circular are of radius R as shown in figure . The two ends of the wire lie on x-axis and y-axis respectively. If the uniform linear charge density on the wire varies as $\rho(\theta) = \rho_0 \cos\theta$, the potential V at the center 'O' will be (Assume V = 0 at infinity)



A) $\frac{\rho_0}{\pi \epsilon_0}$

B) $\frac{\rho_0}{8 \epsilon_0}$

C) $\frac{\rho_0}{2 \epsilon_0}$

D) $\frac{\rho_0}{4\pi \epsilon_0}$

56. Q.Id: 159377

Consider a horizontal sheet with charge density $5\times10^{-6}\ C/m^2$. A particle of mass $8\times10^{-6}\ g$ to dropped from a certain height onto this sheet. The number of electrons that should be removed from this particle so that it stays close to the sheet without falling on it is

$\left(\text{Assume } g=10m/s^2 \text{ and } \frac{1}{4\pi\varepsilon_0}=9\times10^9\ Nm^2C^{-2}\right)$

A) $\frac{2}{9\pi}\times10^8$

B) $\frac{2\pi}{9}\times10^8$

C) $\frac{\pi}{5}\times10^8$

D) $\frac{1}{18\pi}\times10^8$

57. Q.Id: 159376

In an interference experiment, third bright fringe is obtained on the screen with a light of wavelength 700 nm. The wavelength of the light source in order to obtain fifth bright fringe at the same point on the screen is

A) 500 nm

B) 420 nm

C) 630 nm

D) 750 nm

58. Q.Id: 159375

A converging lens of 40 cm focal length in air is immersed in water of refractive index 1.3. The change in focal length of the lens is (Assume $n_{glass}=1.5$)

A) 90 cm

B) 150 cm

C) 50 cm

D) 25 cm

59. Q.Id: 159374

A sinusoidal wave of wavelength λ has a speed of 350 m/s. If the phase difference between two displacements at a certain point at times $1\times10^{-3}s$ apart is π radius, then the value of λ is

A) 40 cm

B) 90 cm

C) 110 cm

D) 70 cm

60. Q.Id: 159373

Two identical wires with equal tension T have fundamental frequency 900 Hz. The tension in one of the wires is increased by ΔT in order to increase the beats by 9 beats/sec.

The magnitude of $\frac{\Delta T}{T}$ is

A) 0.01

B) 0.02

C) 0.03

D) 0.04

61. Q.Id: 159372

An air bubble of volume $'V_1'$ is at the bottom of a lake of depth 'd' , where the temperature is T_1. The bubble rises to the surface, which is at a temperature of T_2. Assuming that the bubble's air is at the same temperature as that of surrounding water, the volume of the bubble at the surface is (Let P_0 is the atmospheric pressure and P_1 is the pressure at T_1)

A) $\frac{nRT_2}{P_1}$

B) $\frac{T_2}{T_1}\left(\frac{P_0+\rho gd}{P_0}\right)V_1$

C) $\frac{nRT_1}{P_1}$

D) $\frac{T_1}{T_2}\left(\frac{\rho gd}{P_0}\right)V_1$

62. Q.Id: 159371

A diatomic ideal gas is compressed adiabatically to $\frac{1}{32}$ of its initial volume. If the initial temperature of the gas is T_i (in Kelvin) and the final temperature is αT_i, the value of $'\alpha'$ is

A) 4

B) 6

C) 5

D) 2

63. Q.Id: 159370

A steel wire of length 1.5 m and $3.0\ mm^2$ cross-section area at $30\ ^oC$ is held straight (but under no tension) by attaching the ends to two walls. The coefficient of linear expansion for the wire is $1.0\times10^{-5}/^oC$ and Young's modulus is $2\times10^{11}\ N/m^2$. If the temperature of the wire is decreased to $-10\ ^oC$, the total tension in the wire will change by

A) 240 N

B) 130 N

C) 330 N

D) 180 N

64. Q.Id: 159369

A metallic bullet of mass 1 g is shot at speed of $100\ ms^{-1}$ into a wooden wall. The metal has specific heat of $200\ J/(kg-^{o}C)$. Assuming all the internal energy generated by the impact remains with the bullet, the temperature change of the bullet is

A) $25^{0}\ C$

B) $45^{0}\ C$

C) $200^{0}\ C$

D) $20^{0}\ C$

65. Q.Id: 159368

Water is flowing with speed of 10 m/s through a pipe with cross-sectional area of $8\ cm^2$.

The water slowly descends 10m. The pipe cross-sectional area at lower level increases to $16\ cm^2$. The pressure at the upper level and lower level is $(1\times10^5)N/m^2$ and $(\alpha\times10^5)N/m^2$ respectively. The value of constant α will be (Assume the density of water = = $1000\ kg/m^3$)

A) 1.75

B) 2.10

C) 2.38

D) 3.22

66. Q.Id: 159367

A hot air balloon is rising upward with acceleration $2.5\ m/s^2$. The ratio of air density outside the balloon to that inside will be (Assume $g = 10\ m/s^2$, Neglect the mass of balloon fabric)

A) $\frac{3}{2}$

B) $\frac{5}{4}$

C) $\frac{4}{3}$

D) $\frac{5}{3}$

67. Q.Id: 159366

If a uniform steel wire of 4 m length and cross-sectional area $3\times10^{-6}\ m^2$ is extended by 1 mm, the energy stored in the wire is (Assume Young's modulus of the wire = $2\times10^{11}\ N/m^2$)

A) 75 mJ

B) 75 J

C) 75 μJ

D) 0.75 μJ

68. Q.Id: 159365

A simple pendulum has a time period T_1 when on the earth's surface and T_2 when taken to a height R above the earth's surface, where R is the radius of the earth. The value of $\frac{T_2}{T_1}$ is

A) 1

B) $\sqrt{2}$

C) 4

D) 2

69. Q.Id: 159364

Consider a simple pendulum where a point mass 'm' is suspended from a hinge with an insulating thin wire of length 'l'. Let there be point charges '+q' each at the hinge and on the point mass. The time period of small osicllations about equilibrium for this pendulum is

A) $T > 2\pi\sqrt{\frac{l}{g}}$

B) $T = 2\pi\sqrt{\frac{l}{g}}$

C) $T = 2\pi\sqrt{\frac{ml}{\left(mg + \frac{1}{4\pi\varepsilon_0}\frac{q^2}{l^2}\right)}}$

D) $T < 2\pi\sqrt{\frac{ml}{\left(mg + \frac{1}{4\pi\varepsilon_0}\frac{q^2}{l^2}\right)}}$

70. Q.Id: 159363

A wheel is rotating freely at an angular speed on a shaft. A second wheel with twice the moment of inertia of the first and initially at rest, is suddenly coupled to the first shaft. If K is the original rotational kinetic energy and ΔK is the loss in rotational kinetic energy, then $\frac{\Delta K}{K}$ is

A) $\frac{1}{4}$

B) $\frac{3}{4}$

C) $\frac{3}{5}$

D) $\frac{2}{3}$

71. Q.Id: 159362

A uniform circular disk of radius R is used as a simple pendulum when suspended from a point. The time period is T_1 if the disk is suspended from a point on its rim. However the time period is T_2 if the disk is suspended from a pivot point at $r = \alpha R$ from the center, where $0 < \alpha < 1$. If $T_1 = T_2$, then the value of α is

A) 0.2

B) 0.4

C) 0.5

D) 0.8

72. Q.Id: 159361

A 4.0 kg bundle starts up a 30^{o} incline with 120 J of kinetic energy. The distance upto which the bundle will slide up the incline, if the coefficient of kinetic function between the bundle and the incline is $\frac{1}{\sqrt{3}}$, is

A) 6 m

B) 10 m

C) 3 m

D) 8 m

73. Q.Id: 159360

At a certain instant, an object is subjected to force $\vec{F}=\left[(4.0)\hat{i}-(2.0)\hat{j}+(9.0)\hat{k}\right]$N while the object's velocity is $\vec{v}=\left[-(2.0)\hat{i}+(4.0)\hat{k}\right]$ m/s. The instantaneous rate at which the force does work on the object is

A) +28 W

B) +44 W

C) -44 W

D) +36 W

74. Q.Id: 159359

A man weighs 70 kg. He stands on a weighing machine in a lift, which is moving downwards with a uniform acceleration of $5\ ms^{-2}$. The reading in the weighing machine is (Assume $g=10\ m/s^2$)

A) 70 kg wt.

B) 35 kg wt.

C) 86.0 kg wt.

D) 1.6 kg wt.

75. Q.Id: 159358

A ball is thrown at some angle with the horizontal and at speed 10 m/s. The speed of the ball at its maximum height H during the motion is 5 m/s. The magnitude of H is (Assume g = $10\ m/s^2$)

A) 3.75 m

B) 4.0 m

C) 6.5 m

D) 2.75 m

76. Q.Id: 159357

The resultant of the two vectors $\vec{A}$ and $\vec{B}$ makes an angle α with $\vec{A}$ and β with $\vec{B}$.

Statement (A) : $\alpha<\beta$ if $|\vec{A}|<|\vec{B}|$

Statement (B) : $\alpha<\beta$ if $|\vec{A}|>|\vec{B}|$

Statement (C) : $\alpha=\beta$ if $|\vec{A}|=|\vec{B}|$

Choose the correct option

A) (A) and (C) are true

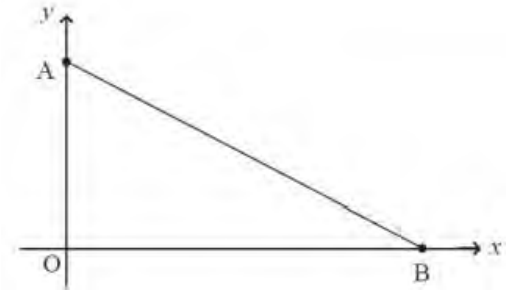
B) Only (C) is true

C) (B) and (C) are true

D) (A), (B), (C) are all true

77. Q.Id: 159356

A and B are the ends of a ladder in contact with a vertical wall and the floor respectively as shown in the figure. Let u_B and v_A be the velocities of B and A in x and y direction respectively. At a time when the angle ABO is 60^o, $u_B = 1\ m/s$, then v_A in m/s is



A) $-\sqrt{3}$

B) $-\frac{1}{\sqrt{3}}$

C) $\frac{1}{\sqrt{3}}$

D) $\sqrt{3}$

78. Q.Id: 159355

An object falls a distance D from rest. The object travels a distance 0.51 D in last 2 seconds.

The time taken by the object to cover the distance D is

A) $\frac{20}{3}s$

B) 5s

C) $\frac{10}{3}s$

D) $\frac{30}{7}s$

79. Q.Id: 159354

The expression for the force is given by $b+\frac{c}{t^3}$, where 'b' and 'c' are some physical quantities and 't' is the time Then the dimensions of 'c' are

A) M^0LT

B) MLT^{-1}

C) MLT^{-2}

D) MLT

80. Q.Id: 159353

Identify incorrect statement among the following.

A) There are four fundamental forces in nature.

B) Conservation laws have a deep connection with symmetries of nature.

C) All conserved quantities are scalars.

D) Some conservation laws are true for one fundamental force but not for the others.

81. Q.Id: 159352

Natural killer cells originate from

A) Adipocyte stem cells

B) Myeloid stem cells

C) Lymphoid stem cells

D) Endothelial stem cells

82. Q.Id: 159351

The first gene therapy was given for the deficiency of :

A) Adenosine deaminase

B) Insulin

C) α-1 Antitripsin

D) α- Lactalbumin

83. Q.Id: 159350

Match the following :

List1	List2
A. Prolonged P - R interval	I. Hypothyroidism
B. Shortened P-R interval	II. Hypokalemia
C. Prolonged Q-T interval	III. Delayed impulse from pacemaker
D. Flat T-wave	IV. Tachycardia

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

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

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

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

84. Q.Id: 159349

'Hisardale' is a new breed of sheep developed in Punjab by using the following breeding technique :

A) Interspecific hybridisation

B) Cross - breeding

C) Out breeding

D) Multiple Ovulation and Embryo Transfer (MOET)

85. Q.Id: 159348

Identify the correct sequence of stages in the evolution of man.

A. Homo neanderthalensis

B. Homo eructus

C. Australopithecus

D. Homo sapiens

E. Dryopithecus

A) A → C → B → E → D

B) C → A → B → E → D

C) E → C → B → A → D

D) E → A → C → B → D

86. Q.Id: 159347

Experimental verification of natural selection was performed by

A) Augustus Weismann

B) Paul Kammarer

C) Hugo de Vries

D) Bernard Kettlewell

87. Q.Id: 159346

In the geological time scale, the golden age of fishes is

A) Tertiary period of coenozoic era

B) Jurassic period of mesozoic era

C) Devonian period of palaeozoic era

D) Carboniferous period of palaeozoic era

88. Q.Id: 159345

Identify the correct statements with reference to sickle cell anemia :

A. Due to point mutation 'glutamic acid' is replaced by 'Valine'.

B. Due to point mutation 'Valine' is replaced by 'glutamic acid'.

C. It is autosomal recessive genetic disorder and affects heterozygous individuals.

D. It is autosomal recessive genetic disorder and affects homozygous individuals.

A) A & D

B) B & C

C) A & C

D) B & D

89. Q.Id: 159344

Match the following :

List1	List2
A. Sex Index 1.0	I. Sex of Drosophila Intersex
B. Sex Index 0.5	II. Sex of Drosophila Meta male
C. Sex Index 0.67	III. Sex of Drosophila Female
D. Sex Index 0.33	IV. Sex of Drosophila Male
E. .	V. Sex of Drosophila Meta female

A) A-> III, B->V, C->II, D->I

B) A-> IV, B->V, C->I, D->II

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

D) A-> V, B->IV, C->I, D->II

90. Q.Id: 159343

Match the following :

List1	List2
A. Pleiotropy	I. More than two alleles occur at the same locus on homologous chromosomes
B. Multiple alleles	II. Expression of both the alleles in hetero - zygous condition
C. Polygenic inheritance	III. Multiple effect of single gene
D. Co-dominance	IV. Single phenotypic character influenced by more than two genes

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

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

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

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

91. Q.Id: 159341

Identify the diagnositc procedure used to detect genetic defects in the embryo :

A) ELISA

B) Amniocentesis

C) Amenorrhea

D) Sonography

92. Q.Id: 159340

Identify the correct sequence of passage of spermatozoa in males.

a. Rete testis

b. Epididymis

c. Urethra

d. Vas deferens

e. Seminiferous tubules

f. Vas efferentia

g. Ejaculatory duct

h. Urethral meatus

A) a→b→d→e→c→f→g→h

B) e→a→f→b→d→g→c→h

C) e→c→a→d→b→g→f→h

D) d→b→a→c→f→e→g→h

93. Q.Id: 159339

Identify the correct statements about T_C cells.

A. They are $CD8^+$ cells.

B. They recognize antigens through MHC class - II protein.

C. They recognize antigen - presenting cells and produce antibodies.

D. They recognize altered - self cells through MHC class - I protein.

A) A & C **B)** A & B

C) A & D **D)** B & C

94. Q.Id: 159338

Match the following :

List1	List2
A. Addison's disease	I. Deficiency of vasopressin
B. Cushing's syndrome	II. Hyposecretion of glucocorticoid
C. Myxedema	III. Over production of glucocorticoids
D. Diabetes insipidus	IV. Low levels of thyroid hormones in adulthood

A) A-> III, B-> II, C-> IV, D-> I **B)** A-> II, B-> I, C-> IV, D-> III

C) A-> II, B-> III, C-> IV, D-> I **D)** A-> II, B-> I, C-> III, D-> IV

95. Q.Id: 159337

Identify the hormones that regulate calcium levels in the human body ?

A. Calcitonin

B. Thyroxine

C. Cortisol

D. Parathyroid hormone

A) A & B **B)** A & D

C) B & C **D)** C & D

96. Q.Id: 159336

Match the following :

List1	List2
A. Alzheimer's Disease	I. Inflammation of the protective membranes covering the brain and the spinal cord.
B. Meningitis	II. Progressive disorder of the central nervous system affecting motor movements.
C. Parkinson's Disease	III. Rapid loss of brain functions due to disturbance in the blood supply to the brain.
D. Stroke or Cerebro-vascular accident	IV. Progressive neurologic disease of the brain leading to the loss of neurons and the loss of intellectual abilities.

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

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

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

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

97. Q.Id: 159335

Identify the correct statement with reference to vomer bone :

A) It forms the bridge of the nose.

B) It forms the upper jaw.

C) It is a triangular bone present on the floor of nasal cavity.

D) It forms the anterior part of the palate.

98. Q.Id: 159334

Which of the following features best suits to a healthy/normal individuals urine :

A) Dark yellow colour : pH ; 6.0; 90% H_2O, 10% urea

B) Pale yellow colour : pH ; 7.0; 96% H_2O, 2% urea, 2% other substance

C) No colour : pH ; 6.0; 98% H_2O, 2% urea, 1% glucose

D) Pale yellow colour : pH ; 6.0; 96% H_2O, 2% urea, 2% other substances

99. Q.Id: 159333

Match the following :

List1	List2
A. Valve of thebesius	I. Gaurds left atriventricular aperture
B. Eustachean valve	II. Gaurds the opening of coronary sinus into right atrium
C. Tricuspid valve	III. Non functional in adults
D. Bicuspid valve	IV. Gaurds right atrioventricular aperture

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

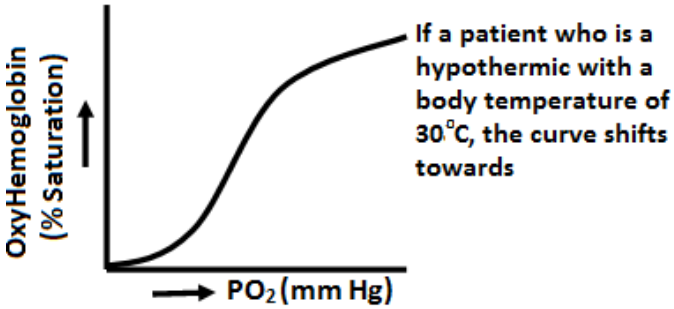
B) A-> II, B-> III, C-> IV, D-> I

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

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

100. Q.Id: 159332

A sigmoid curve is obtained when percentage saturation of hemoglobin (Hb) with oxygen is plotted against the PO_2 as indicated below :



A) Curve shifts to the right side due to less affinity of Hb with oxygen.

B) Curve shifts to the left side due to higher affinity of O_2 with hemoglobin.

C) Curve will not shift either to left or right.

D) Curve becomes straight line instead of sigmoidal.

101. Q.Id: 159331

Which one of the following organs acts as haemopoietic organs in the foetus and erythroclastic organs in the adult ?

A) Bone marrow

B) Liver

C) Kidney

D) Pancreas

102. Q.Id: 159330

Identify the correct combinations.

A. Ozone Layer - UV - Blurred Vision

B. Green House effect - Methane - El-nino effect

C. Acid rain - SO_2 - Photochemical smog

D. Eutrophication - Algal blooms - Ageing of lake

A) A & B

B) C & D

C) B & D

D) A & D

103. Q.Id: 159329

Identify the correct statements with reference to special adaptation to aquatic habitat.

A. Fresh water fishes have large glomerular kidneys and salt absorbing chloride cells in gills.

B. Marine fishes have large glomerular kidneys and salt excreting chloride cells in gills.

C. Marine fishes have aglomerular kidneys and salt secreting chloride cells in gills.

D. Fresh water fishes have aglomerular kidneys and salt secreting chloride cells in gills.

A) A & B

B) A & C

C) B & D

D) C & D

104. Q.Id: 159328

Statement (S) : The water flea Daphnia exhibits characteristic head shapes during various seasons.

Reason (R) : Cyclomorphosis is a seasonal adaptation to changing densities of water in the fresh water lakes.

The correct answer is

A) Both (S) and (R) are correct and (R) is correct explanation to (S).

B) Both (S) and (R) are correct but (R) is not correct explanation to (S).

C) (S) is correct but (R) is incorrect.

D) (S) is incorrect but (R) is correct.

105. Q.Id: 159327

Statement (S) : The image formed in nocturnal insects is called superposition image.

Reason (R) : The superposition image is a clear image.

The correct answer is

A) Both (S) and (R) are correct and (R) is the correct explanation to (S).

B) Both (S) and (R) are correct but (R) is not correct explanation to (S).

C) (S) is correct but (R) is not correct.

D) (S) is not correct but (R) is correct.

106. Q.Id: 159326

The principle muscles of respiration in cockroach are

A) Ventral longitudinal muscles

B) Dorsoventral muscles

C) Alary muscles

D) Abductor muscles

107. Q.Id: 159325

In Periplaneta americana, there are three pairs of jointed walking legs, one pair attached to each thoracic segment on the ventral side. Each leg is made up of five segments or podomeres arranged serially. Identify the sequence of arrangement of podomeres from the base to the tip.

A) Tibia → tarsus → trochanter → coxa → femur

B) Coxa → trochanter → femur → tibia → tarsus

C) Femur → tibia → coxa → trochanter → tarsus

D) Tarsus → tibia → femur → trochanter → coxa

108. Q.Id: 159324

The tranquilizer which is normally used as a medicine to treat mental illnesses and often abused is

A) Barbiturate

B) Amphetamine

C) Lysergic acid diethylamide

D) Benzodiazepine

109. Q.Id: 159323

The process of 'exflagellation' occurs in which one of the following stages of the life cycle of plasmodium ?

A) Sporogony

B) Erythrocytic schizogony

C) Hepatic schizogony

D) Gametogony

110. Q.Id: 159322

Match the following :

List1	List2
A. Parasitic Castration	I. Abnormal increase in the size of the host cells
B. Neoplasia	II. Increase in the number of cells of the host
C. Hyperplasia	III. Degeneration of gonads of the host
D. Hypertrophy	IV. Abnormal division of the cells in the host tissues leading to cancer
E. .	V. Abnormal increase in the size of the host

A) A-> V, B-> III, C-> I, D-> II **B)** A->III, B-> IV, C-> II, D-> I

C) A-> IV, B-> II, C-> III, D-> V **D)** A-> II, B-> V, C-> IV, D-> III

111. Q.Id: 159321

Match the following :

List1	List2
A. Binary fission	I. Unfavourable condition
B. Multiple fission	II. Nuclear reorganisation
C. Sexual reproduction	III. Favourable condition
D. Conjugation	IV. Genetic recombination

A) A-> I, B-> III, C-> IV, D-> II **B)** A-> IV, B-> II, C-> III, D-> I

C) A-> III, B-> I, C-> IV, D-> II **D)** A-> II, B-> IV, C-> III, D-> I

112. Q.Id: 159320

The communication tubules of flagella which connect the basal granule to plasma membrane and nucleus which can pull and alter the orientation of flagellum are

A) Dynein arms

B) Triplets

C) Doublets

D) Rootlets

113. Q.Id: 159319

Match the following :

List1	List2
A. Chelonia	I. Sphenodon
B. Rhynchocephalia	II. Hemidactylus
C. Crocodilia	III. Testudo
D. Squamata	IV. Gavialis

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

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

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

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

114. Q.Id: 159318

Study the following characters :

a. Aquatic (marine and fresh water) forms

b. Body scaleless

c. Cartilaginous endoskeleton

d. Renal portal system absent

The above characters are found in

A) Chondrichthyes

B) Hemichordata

C) Cyclostomata

D) Cephalochordata

115. Q.Id: 159317

Match the following :

List1	List2
A. Tornaria	I. Neometra
B. Brachiolaria	II. Balanoglossus
C. Pentacrinoid	III. Holothuria
D. Auricularia	IV. Pentaceros

A) A-> II, B-> I, C-> III, D-> IV **B)** A-> II, B-> IV, C-> I, D-> III

C) A-> I, B-> III, C-> II, D-> IV **D)** A-> IV, B-> III, C-> I, D-> II

116. Q.Id: 159316

Identify the correct statement with reference to Cnidaria.

A. First metazoans to exhibit tissue level organisation.

B. Contain stinging cells called colloblasts.

C. Reproduce only by sexual reproduction.

D. Development is indirect and includes planula larva.

A) A & C **B)** A & B

C) A & D **D)** B & D

117. Q.Id: 159315

Match the following :

List1	List2
A. Astrocytes	I. Movement of cerebrospinal fluid
B. Ependymal cells	II. Myelin sheath around axons of CNS
C. Oligodendrocytes	III. Myelin sheath around axons of PNS
D. Schwann cells	IV. Formation of blood - brain barrier

A) A-> IV, B-> II, C-> I, D-> III **B)** A-> II, B-> I, C-> III, D-> IV

C) A-> IV, B-> I, C-> II, D-> III **D)** A-> IV, B-> III, C-> II, D-> I

118. Q.Id: 159314

Match the following :

List1	List2
A. Acoelomate	I. Earth worm
B. Pseudocoelomate	II. Acorn worm
C. Schizocoelomate	III. Tape worm
D. Enterocoelomate	IV. Round worm

A) A-> II, B->I, C-> III, D-> IV **B)** A-> III, B->IV, C-> I, D-> II

C) A-> I, B->II, C-> IV, D-> III **D)** A-> II, B->III, C-> IV, D-> I

119. Q.Id: 159313

The diversity within a particular area, community or ecosystem is called

A) Alpha diversity **B)** Beta diversity

C) Gamma diversity **D)** Delta diversity

120. Q.Id: 159312

Statement (S) : Species is a breeding unit.

Reason (R) : A species is reproductively isolated from individuals of the other species.

The correct answer is

A) Both (S) and (R) are correct and (R) is the correct explanation to (S). **B)** Both (S) and (R) are correct but (R) is not correct explanation to (S).

C) (S) is correct but (R) is not correct. **D)** (S) is not correct but (R) is correct.

121. Q.Id: 158976

Silencing of a specific MRNA due to a complementary short RNA sequence that binds to and prevents translation of the mRNA is called

A) RNA hybridization **B)** RNA complementation

C) RNA interference **D)** RNA splicing

122. Q.Id: 158975

Match the following :

List1	List2
A. Pusa Swarnim	I. Chilly mosaic virus
B. Pusa Shubhra	II. Bacterial blight
C. Pusa Sadabahar	III. White rust
D. Himgiri	IV. Black rot
E. .	V. Hill bunt

A) A->ii, B->v, C->iii, D->iv **B)** A->iii, B->iv, C->i, D->v

C) A->iv, B->i, C->ii, D->iii **D)** A->v, B->ii, C->i, D->iii

123. Q.Id: 158974

Assertion (A) : Bt transgenic crops are more tolerant to abiotic stresses.
Reason (R): Bt toxins are coded by 'cry' genes. The correct answer is

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

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

C) (A) is true but (R) is false.

D) (A) is false but (R) is true.

124. Q.Id: 158973

A cloning vector should possess which of the following characters?
I. Origin of replication (Ori).
II. Ability to destroy the alien DNA.
III. Cloning site to link the alien DNA
IV. The tumor inducing plasmid Ti
V. Selectable marker
VI. Low molecular weight
The correct combination is

A) I,II,IV,V and VI **B)** I,III,V and VI

C) I,II,III and IV **D)** II,III,IV and Vi

125. Q.Id: 158971

Assertion (A): Restriction endonucleases cut the DNA molecule at specific sites.

Reason (R): Exonucleases remove nucleotides from the ends of the DNA like that of endonucleases.

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

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

C) (A) is true but (R) is false.

D) (A) is false but (R) is true.

126. Q.Id: 158970

Assertion (A) : The structural gene in a transcription unit can be said to be monocistronic or polycistronic.

Reason (R) : In eukaryotes, the monocistronic structural gene has interrupted coding sequence but the genes in eukaryotes split. The coding sequence or expressed sequences are defined as exons. Exons are said to be those sequence that appear in mature or processed RNA.

The correct answer is

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

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

C) (A) is true but (R) is false.

D) (A) is false but (R) is true.

127. Q.Id: 158967

Match the following lists :

List1	List2
A. Erwin Chargaff	I. Transforming principle
B. Frederick Griffith	II. Nuclein
C. Alfred Hershey	III. Ratio between A and T and that between G and C are constant, each equals one
D. Colin MacLeod	IV. Biochemical nature of transforming principle
E. .	V. DNA as the genetic material that is passed from virus to bacteria

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

B) A->iii, B->i, C->v, D->iv

C) A->ii, B->iii, C->i, D->v

D) A->i, B->ii, C->iii, D->v

128. Q.Id: 158964

With respect to DNA synthesis, identify the correct combination of statements.

I. Always the direction of DNA polymerisation is 5' → 3' when referring to the polarity of strand being synthesized.

II. DNA ligase forms hydrogen bonds between two newly synthesized DNA strands.

III. DNA polymerases on their own cannot initiate the process of replication.

IV DNA polymerase can catalyse polymerization in both 5' → 3' and 3' → 5' direction.

A) II,III and IV

B) I and II

C) I and III

D) III and IV

129. Q.Id: 158954

Which of the following trait was not studied by mendel in his work?

A) Seed colour

B) Stem height

C) Flower colour

D) Capsule shape

130. Q.Id: 158952

In a Mendel's dihybrid cross, homozygous, dominant, round, yellow seed parent was crossed with a homozygous recessive wrinkled green seed colour (Y) is dominant over green seed colour (y), what is the expected percentage of obtaining F_2 progeny with between the two genes.

A) Approximately 19%

B) Approximately 56%

C) Approximately 33%

D) Approximately 75%

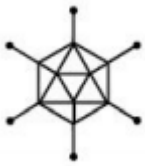
131. Q.Id: 158948

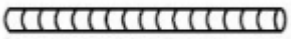
Match the following lists :

List1

A. 

B. 

C. 

D. 

E. .

List2

I. Lambda phage

II. TMV

III. Adenovirus

IV. HIV

V. Bacteriophage

A) A->v, B->i, C->iii, D->ii

B) A->v, B->iii, C->i, D->ii

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

D) A->iii, B->v, C->iv, D->i

132. Q.Id: 158946

Match the following lists :

List1	List2
A. Photoautotroph	I. Xanthomonas
B. Photoheterotroph	II. Rhodopseudemonas
C. Saprophyte	III. Bacillus
D. Parasite	IV. Chlorobrium

A) A->iv, B->i, C->ii, D->iii **B)** A->iv, B->ii, C->iii, D->i

C) A->i, B->iii, C->iv, D->ii **D)** A->ii, B->iv, C->iii, D->i

133. Q.Id: 158945

Ethylene is a simple gaseous plant growth regulator. Identify in which of the following the ethylene is synthesized in large amount by tissues ?

I. Senescence

II. Ripening of fruits

III. Actively growing apices of stems and roots

IV. Cell division promoting activity

A) I and II **B)** II and III

C) III and IV **D)** IV and I

134. Q.Id: 158944

With respect to oxidative phosphorylation, the correct combination of statements is

I. Cytochrome 'C' oxidase complex contains cytochromes a and a_3, and two cobalt centres.

II. Cytochrome 'C' is a small mobile electron carrier protein.

III. Oxidation of NADH and $FADH_2$ give rise to 3 molecules of ATP.

IV. Light energy is not utilized for the production of proton gradient required for phosphorylation.

A) I and II **B)** II and III

C) III and IV **D)** II and IV

135. Q.Id: 158943

Match the following lists :

List1	List2
A. Decarboxylation	I. Fumarate to malate
B. Hydration	II. Oxalosuccinic acid to α - ketoglutaric acid
C. Dehydration	III. Formation of citrate from OAA and Acetyl CoA
D. Oxidative decarboxylation	IV. Citrate to Cis-aconitic acid
E. .	V. α - ketoglutaric acid to succinyl CoA

A) A->v, B->i, C->iv, D->ii

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

C) A->ii, B->i, C->iv, D->v

D) A->ii, B->iv, C->i, D->v

136. Q.Id: 158941

Assertion (A) :C_4 plants show greater productivity of biomass thanC_3 plants.

Reason (R) :Leaves ofC_4 plants have '' Kranz anatomy'' where bundle sheath cells lack Rubisco enzyme.As a result,C_4 plants lack photorespiration.

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

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

C) (A) is true but (R) is false.

D) (A) is false but (R) is true.

137. Q.Id: 158940

Which of the following co-factor is required for splitting of water in oxygen evolving complex associated with the PS II in green plants during photo synthesis?

A) Mn

B) Fe

C) Mg

D) Cd

138. Q.Id: 158939

Assertion (A) : Glucose + ATP $\xrightarrow{\text{Hexokinase}}$ Glucose - 6 - Phosphate + ADP

Reason (R) : Enzyme with catalyzes this reaction belongs to enzyme class ''Transferase''.

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

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

C) (A) is true but (R) is false.

D) (A) is false but (R) is true.

139. Q.Id: 158936

Potassium ion (K^+) performs which of the following functions in plants?

I. It is involved in protein synthesis.

II. It helps in photolysis of water during photosynthesis.

III. Essential for the formation of chlorophyll.

IV. Maintains anion-cation balance.

V. Required for pollen germination.

The correct combination is

A) I and IV

B) II,III and IV

C) I,II and III

D) II,III,IV and V

140. Q.Id: 158935

Arrange the following in the pathway of water movement in the root.

I. Cortex

II. Epidermis

III. Pericycle

IV. Endodermis

The correct answer is

A) I,II,IV,III

B) II,I,IV,III

C) II,III,I,IV

D) I,II,III,IV

141. Q.Id: 158934

Identify a combination of ecological adaptations in xerophytes.

I. Cuticle is totally absent.

II. Hypostomatous and sunken stomata in some plants

III Root caps are usually absent.

IV. Well developed root caps.

The correct pair is

A) I and II

B) II and III

C) III and IV

D) II and IV

142. Q.Id: 158933

Assertion (A) : 'Adaptation' for coping with environmental extremes is defined as any attribute of the organism (morphological, physiological, behavioural) that enables it to survive and reproduce in its habitat.

Reason (R) : Plant adaptations have evolved over a short evolutionary time and are due to changes that occur in genetic material during acclimatisation.

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

B) Both (A) and (R) are true bur (R) IS nor the correct explanation of A).

C) (A) is true but (R) is false.

D) (A) is false but (R) is true.

143. Q.Id: 158932

Assertion (A) : In monocotyledons, vascular bundles do not form secondary tissues.

Reason (R) : In monocotyledones, cambium is absent in vascular bundles.

The correct answer is

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

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

C) (A) is true but (R) is false.

D) (A) is false but (R) is true.

144. Q.Id: 158931

Which of the following cell-type is not dead at maturity in angiosperms?

A) Sieve tube elements

B) Phloem fibres

C) Vessels

D) Xylem fibres

145. Q.Id: 158930

Identify the correct combination of statements.

I. During leptotene, chromosomes become gradually visible.

II. Nuclear membrane and nucleolus do not reappear in Telophase I of Meiosis I.

III. Anaphase II does not begin with simultaneous splitting of the centromere of each chromosome in Meiosis II.

IV Prophase I is characterised by appearance of bivalent chromosomes as tetrads in Meiosis I.

The correct combination is:

A) II and IV

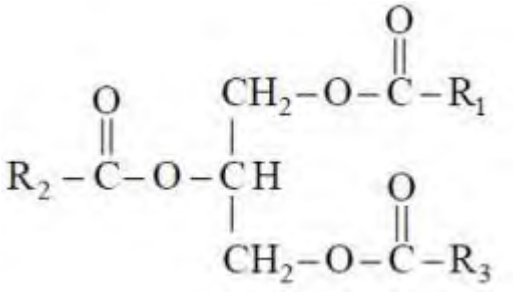
B) III and II

C) I and IV

D) I and II

146. Q.Id: 158929

Identify the following biomolecule:



The above biomolecule is

A) Triglyceride

B) Glycerol

C) Phospholipid

D) Cholesterol

147. Q.Id: 158928

Match the following lists:

List1	**List2**
A. Amyloplasts	I. Colour less plastids of varied shapes, sizes with stored nutrients
B. Elaioplasts	II. Store proteins
C. Aleuroplasts	III. Store carbohydrates (Starch)
D. Leucoplasts	IV. Store oils and fats
E. .	V. Store carotene and xanthophylls

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

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

C) A->ii, B->i, C->v, D->iii

D) A->iii, B->iv, C->v, D->ii

148. Q.Id: 158927

The floral formula $Br, Brl, \%, \female, K_{(5)}, C_{1+2+(2)}, A_{(9)+1}, G_{1}^{-}$ **belongs to**

A) Solanum nigrum

B) Pisum sativam

C) Allium cepa

D) Withania somnifera

149. Q.Id: 158926

Identify the correct combination of the plant with the family it belongs to

A) Gloriosa superba - Liliaceae

B) Lycopersicon esculentum - Fabaceae

C) Phaseolus mungo - Solanaceae

D) Aloe vera - Fabaceae

150. Q.Id: 158925

In which of the following plants, hydrophily is a common phenomenon

A) Water hyacinth

B) Water lily

C) Hydrilla

D) Amorphophallus

151. Q.Id: 158924

A typical angiosperm embryo sac, at maturity, is

A) 7-nucleate 8-celled

B) 8-nucleate 7-celled

C) 8-nucleate 8-celled

D) 7-nucleate 7-celled

152. Q.Id: 158923

Assertion (A) : In flowering plants, both male and female flowers may be present on the same individual,called ''dioecious" or present on separate individuals, called "monoecious"

Reason (R) : In flowering plants, the unisexual male flower is staminate. i.e., bearing stamens, while the female is pistillate. i.e., bearing pistils.

The correct answer is

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

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

C) (A) is true but (R) is false.

D) (A)is false but (R) is true.

153. Q.Id: 158922

Assertion (A) : In Calotropis, the aestivation is said to be valvate.

Reason (R) : Here the sepals or petals in a whorl just touch one another at the margin without overlapping.

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

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

C) (A) is true but (R) is false.

D) (A) is false but (R) is true.

154. Q.Id: 158921

Match the following lists:

List1	List2
A. Cypsella	I. Jack fruit
B. Schizocarpic	II. Tridax
C. Caryopsis	III. Rice
D. Composite fruit	IV. Acacia

A) A->ii, B->i, C->iv, D->iii **B)** A->ii, B->iv, C->iii, D->i

C) A->iv, B->ii, C->i, D->iii **D)** A->ii, B->iii, C->iv, D->i

155. Q.Id: 158920

Arrange the following in order of their occurrence (from top to bottom) in the regions of the root tip

I. Region of maturation

II. Region of elongation

III.Region of meristematic activity

IV Root cap region II.

The correct sequence is

A) I,III,II,IV **B)** III,I,IV,II

C) II,III,I,IV **D)** I,II,III,IV

156. Q.Id: 158919

Small specialised roots called coralloid roots are associated with Ny-fixing cyanobacteria In Pinus

A) Pinus **B)** Cedrus

C) Ginkgo **D)** Cycas

157. Q.Id: 158918

Fusion between one large, non-motile female gamete and a smaller, motile gamete is called _____.

A) Isogamous **B)** Anisogamous

C) Oogamous **D)** Transduction

158. Q.Id: 158917

Match the following:

List1	List2
A. Sutton and Boveri	I. Identification of Auxins
B. F.W. went	II. Artificial synthesis of the gene
C. Hargovind Khorana	III. Role of chromosome in heredity
D. VS Rama Das	IV. Discovery of zymase
E. .	V. Contribution in C_4 photosynthesis

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

B) A->v, B->iii, C->ii, D->i

C) A->iii, B->i, C->ii, D->v

D) A->iv, B->v, C->iii, D->ii

159. Q.Id: 158916

Assertion (A): The six kingdom classification proposed by Carl Woese included Bacteria, Archaebacteria, Protista, Fungi, Plantae and Animalia.

Reason (R): Carl Woese divided six kingdoms into 2 domains using 16s rRNA.

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

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

C) (A) is true but (R) is false.

D) (A) is false but (R) is true.

160. Q.Id: 158915

Study the following lists:

List1	List2
A. Triticum	I. Anacardiaceae
B. Lycopersicon	II. Fabaceae
C. Mangifera	III. Poaceae
D. Glycine max	IV. Liliaceae
E. .	V. Solanaceae

A) A->iii, B->i, C->v, D->ii

B) A->iii, B->v, C->i, D->ii

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

D) A->iv, B->v, C->i, D->iii