Previous Paper Questions

1. Q.Id: 160367

The order of basic strength of the following in aqueous solution is

NH_3, $C_2H_5NH_2$, $(C_2H_5)_2NH$, $(C_2H_5)_3N$

A) $(C_2H_5)_3N > (C_2H_5)_2NH > C_2H_5NH_2 > NH_3$

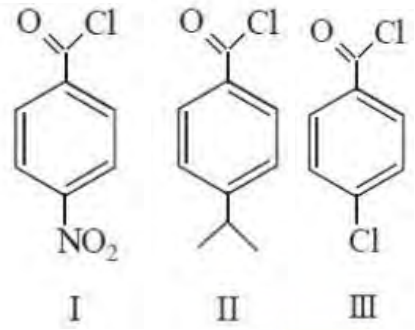
B) $(C_2H_5)_2NH > (C_2H_5)_3N > C_2H_5NH_2 > NH_3$

C) $(C_2H_5)_3N > C_2H_5NH_2 > (C_2H_5)_2NH > NH_3$

D) $NH_3 > H_2NC_2H_5 > (C_2H_5)_3N > (C_2H_5)_2NH$

2. Q.Id: 160364

The order of rate of hydrolysis of the following acyl chlorides with NaOH is



I II III

A) I > II > III

B) II > I > III

C) III > II > I

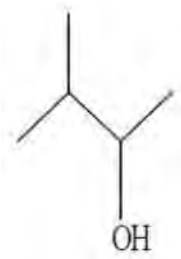
D) I > III > II

3. Q.Id: 160363

What is Z in the following reaction sequence ?

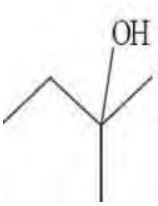
$$\text{ethylene} \xrightarrow{HBr} X \xrightarrow{Mg/\text{dry ether}} Y \xrightarrow[2)\ H_3O^{\oplus}]{1)\ \text{Propionaldehyde}} Z$$

A)

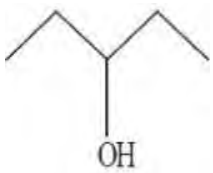


B)

C)



D)



4. Q.Id: 160362

Identify the correct sequence with respect to the mechanism of hydration of an alkene in the presence of a dilute acid

a) Nucleophilic attack of water on carbocation

b) Protonation of alkene by $H_3O^{\oplus}$ to form carbocation

c) Electrophilic attack of $H^{\oplus}$ on alkene

d) Deprotonation of protonated alcohol

e) Electrophilic attack of water on carbocation

A) c, e, d

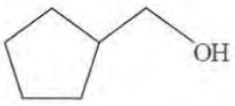
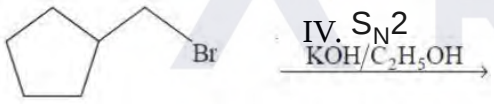
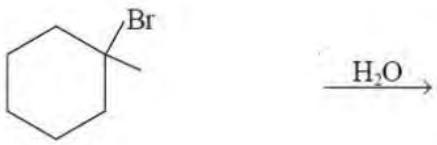
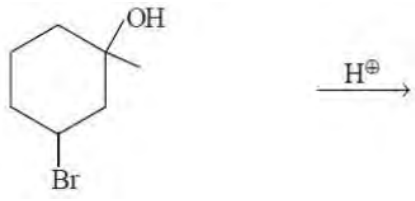
B) b, e, d

C) b, a, d

D) c, a, d

5. Q.Id: 160360

Match the following

List1	**List2**
A. 	I. S_N1
B. 	II. E_1
C. 	III. E_2
D. 	IV. S_N2

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

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

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

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

6. Q.Id: 160358

Furacine is an

A) Antibiotic

B) Analgesic

C) Antihistamine

D) Antiseptic

7. Q.Id: 160357

According to classification of amino acids, lysine belongs to the following

A) Acidic amino acid

B) Basic amino acid

C) Neutral amino acid

D) Non-essential amino acid

8. Q.Id: 160356

The natural rubber is soluble in the following

A) Water

B) Dilute acid

C) Dilute alkali

D) Benzene

9. Q.Id: 160355

The number of bridging carbonyls respectively in $Mn_2(CO)_{10}$ **and** $Co_2(CO)_8$ **are**

A) 0, 0

B) 1, 1

C) 1, 0

D) 0, 2

10. Q.Id: 160354

Identify the set of elements which do not exhibit multiple oxidation states

A) Sc, Ti

B) Mn, Cr

C) Zn, Cr

D) Zn, Sc

11. Q.Id: 160353

When dilute ferrous (Fe^{2+}) **salt solution is added to an aqueous solution containing nitrate** $\left(NO_3^-\right)$ **ion followed by the addition of conc.** H_2SO_4 **forms a brown colored ring. What is the chemical composition of the complex that is responsible for this brown colored ring**

A) $Fe(NO_3)_2$

B) $\left[Fe(H_2O)_5(NO)\right]^{2+}$

C) $\left[Fe(H_2O)_5(NO_3)\right]^{+}$

D) $\left[Fe(H_2O)_4(NO)(NO_3)\right]^{+}$

12. Q.Id: 160349

Statement (A) : Aqueous PCl_3 is an electrical conductor due to the formation of HCl

Statement (B) : All five bonds of PCl_5 are equivalent

Which of the following is true ?

A) Statements (A), (B) are correct

B) Only statement (A) is correct

C) Only statement (B) is correct

D) Statements (A), (B) are not correct

13. Q.Id: 160348

Gibbs free energy change for the formation of Al_2O_3 and MgO at $25\ ^oC$ are approximately -1040 and -1080 $kJmol^{-1}$ respectively, Which of the following statement (s) is (are) correct for the above data ?

a) The reduction of MgO by Al is thermodynamically feasible at $25\ ^oC$

b) The reduction of Al_2O_3 by Mg is thermodynamically feasible at $25\ ^oC$

c) Aluminum can be extracted from Al_2O_3 by mixing it with Mg at $25\ ^oC$, but it is slow

d) Magnesium may be extracted from MgO by mixing it with Al at $25\ ^oC$

A) b

B) a

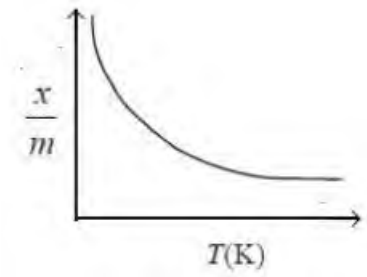
C) b, c

D) a, d

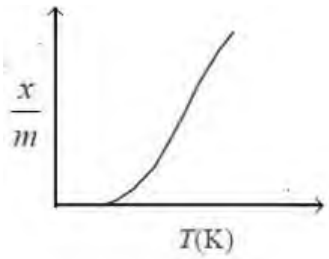
14. Q.Id: 160347

Which of the following represents chemisorption ?
(x = The mass of the adsorbate, m = Mass of the adsorbent)

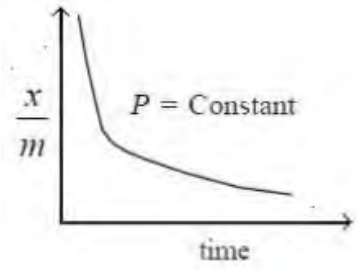
a)



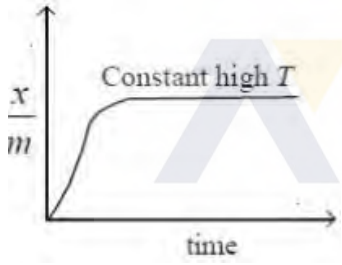
b)



c)



d)



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

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

15. Q.Id: 160344

For a reaction the activation energy is zero. What is the value of rate constant at 300 K [Given $k_{280\ K} = 1.6 \times 10^6 s^{-1}; R = 8.314\ J\ mol^{-1}K^{-1}$]

A) $20 \times 1.6 \times 10^6\ s^{-1}$ **B)** $10 \times 1.6 \times 10^6\ s^{-1}$

C) $1.6 \times 10^6\ s^{-1}$ **D)** 0

16. Q.Id: 160341

In the electrochemical conversion (Kolbe's electrolysis) of R-COONa to R - R, 1A current was passed for 965 seconds. Calculate the amount of R-R formed in this process (Faraday constant =$96,500\ C\ mol^{-1}$)

A) 10 m mol

B) 5 m mol

C) 100 m mol

D) 50 m mol

17. Q.Id: 160340

If the osmatic pressure of human blood is 7.53 atm at$37^{o}C$, calculate the concentration of non electrolyte solutes in the blood ?

A) $0.296\ mol\ L^{-1}$

B) $0.592\ mol\ L^{-1}$

C) $1.12\ mol\ L^{-1}$

D) $1\ mol\ L^{-1}$

18. Q.Id: 160338

The ratio of any colligative property for KCl solution to that of sugar solution of same molality is

A) 1

B) 0.5

C) 2

D) 3

19. Q.Id: 160337

Match the following

List1	List2
A. Metallic	I. CaF_2
B. Covalent solid	II. SiC
C. Non-polar molecule	III. H_2O
D. Ionic	IV. I_2
E. Polar molecule	V. Ag
F. ,	VI. Ar

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

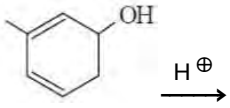
B) A-> VI, B-> IV, C-> II, D-> III, E-> I

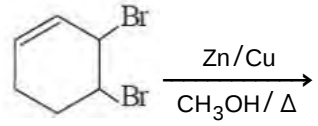
C) A-> V, B-> III, C-> IV, D-> II, E-> III

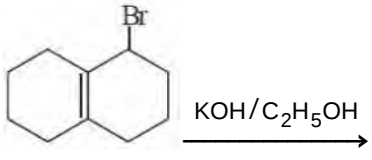
D) A-> V, B-> IV, C-> VI, D-> III, E-> I

20. Q.Id: 160336

Which of the following reactions give an aromatic compound ?

a) 

b) 

c) 

d) $3(CH_3)_2CO \xrightarrow{\text{conc. } H_2SO_4}$

A) a, d

B) a, c

C) b, c

D) b, d

21. Q.Id: 160333

Kolbe's electrolytic reaction of sodium salt solution of hexanoic acid gives the following major product

A) n-dodecane

B) n-decane

C) n-hexane

D) n-pentane

22. Q.Id: 160332

The mixture of isomeric products obtained on nitration of phenol are separated by the following method

A) Crystallisation

B) Steam distillation

C) Sublimation

D) Differential extraction

23. Q.Id: 160331

Which of the following statements is not correct ?

A) Ozone is not a green house gas

B) Ozone can oxidise NO to NO_2

C) Ozone is a bent molecule

D) Ozone filters the ultraviolet light in upper stratosphere

24. Q.Id: 160329

Which of the following compound has a smooth structure with no dangling bonds ?

A) Diamond

B) Graphite

C) Coke

D) C_{60}

25. Q.Id: 160327

$B(OH)_3$ forms a layered structure in the solid state. Which statement best describes the bonding of oxygen atoms in this structure ?

A) Each oxygen atom is bonded to two hydrogen atoms through hydrogen bonds

B) Each oxygen atom is bonded to one hydrogen atom through covalent bond and another hydrogen atom through hydrogen bonds

C) 50% of the oxygen atoms are attached to two hydrogen atoms through covalent bonds and the remaining 50% to two hydrogen atoms through hydrogen bonds

D) Each oxygen atom is attached to two hydrogen atom through covalent bonds

26. Q.Id: 160325

Anhydrous calcium sulphate is called

A) Gypsum

B) Plaster of Paris

C) Dead burnt plaster

D) Portland cement

27. Q.Id: 160324

If the boiling points of H_2O and D_2O are $(H_2O)_{bp}$ and $(D_2O)_{bp}$ and the vapour pressures of H_2O and D_2O are $(H_2O)_{vp}$ and $(D_2O)_{vp}$, which of the following is correct ?

A) $(H_2O)_{bp} = (D_2O)_{bp}, (H_2O)_{vp} = (D_2O)_{vp}$

B) $(H_2O)_{bp} < (D_2O)_{bp}, (H_2O)_{vp} > (D_2O)_{vp}$

C) $(H_2O)_{bp} > (D_2O)_{bp}, (H_2O)_{vp} < (D_2O)_{vp}$

D) $(H_2O)_{bp} < (D_2O)_{bp}, (H_2O)_{vp} < (D_2O)_{vp}$

28. Q.Id: 160323

A weak mono basic acid after treatment with 15 ml of 0.1 M BOH (base) has a pH of 5. Volume of same base required to completely neutralize the acid is 30 mL. Calculate pK_a of acid.

A) 5.5

B) 4.5

C) 5

D) 4

29. Q.Id: 160322

Which of the following statements are correct for the reaction $SO_2Cl_{2(g)} \rightleftharpoons SO_{2(g)} + Cl_{2(g)}$, at 500 K ?

a) $K_p > K_c$

b) Rate of the forward reaction increases with increasing pressure

c) Rate of the forward reaction increases on removing Cl_2 gas

d) Rate of the forward reaction increases with decreasing pressure

A) a, b, d

B) a, c, d

C) b, c, d

D) a, d

30. Q.Id: 160320

Find out the value of log K [K = equilibrium constant] for the following reaction at 298 K [Given $\Delta_r G^o$ at 298 K = -13.6 kJmol^{-1}]

$2NH_{3(g)} + CO_{2(g)} \rightleftharpoons NH_2CONH_{2(aq)} + H_2O_{(l)}$

A) 1.69

B) 2.38

C) 4.76

D) 3.38

31. Q.Id: 160318

Approximately how many litres of 0.25 M $Zn(NO_3)_2$ solution can be prepared from 75.6 g of $Zn(NO_3)_2$?

A) 1.6 L

B) 0.9 L

C) 3.2 L

D) 2.2 L

32. Q.Id: 160317

Calculate the approximate mole fraction of the solute in 1 molar aqueous solution

A) 0.036

B) 1.80

C) 0.18

D) 0.018

33. Q.Id: 160315

The root mean square velocity of an ideal gas at a constant pressure varies with density (d) as

A) d^2

B) d

C) $\sqrt{d}$

D) $\frac{1}{\sqrt{d}}$

34. Q.Id: 160313

The ratio of relative rates of diffusion of N_2 and H_2 gases is approximately

A) 1 : 3.75

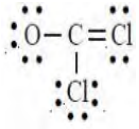
B) 1 : 14.0

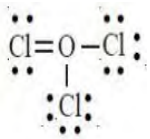
C) 1 : 28.75

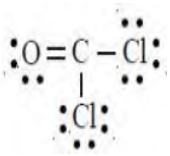
D) 1 : 42.0

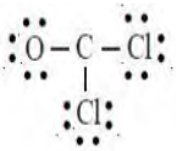
35. Q.Id: 160312

Select the most stable and correct structure of $COCl_2$

A) 

B) 

C) 

D) 

36. Q.Id: 160311

Statement (A) : Isoelectronic molecules and ions have the same bond order

Statement (B) : With increase in bond order, bond length decreases and bond enthalpy increases

Which one of the following options correctly represent the above statements ?

A) Statement (A) is correct, statement (B) is wrong

B) Statement (A), (B) are correct

C) Statement (A) is not correct and (B) is correct

D) (A), (B) are not correct statements

37. Q.Id: 160309

Which of the following statements are not correct ?

a) In a period electronegativity increases with increases in atomic number

b) The higher the electronegativity of the central atom in a polyatomic molecule, the lesser would be the magnitude of the bond angle

c) Electronegativity of the atom would increase with increase in s-character of its hybrid orbitals

d) The element with most negative electron gain enthalpy is fluorine

The correct answer is

A) a, b

B) a, b, d

C) b, d

D) a, c

38. Q.Id: 160308

The correct order for first ionization enthalpy of Na, Mg, Al, Si follows the order

A) Na < Mg > Al < Si

B) Na > Mg > Al > Si

C) Na < Mg < Al < Si

D) Na > Mg > Al < Si

39. Q.Id: 160307

The wavelength of the wave of a hydrogen atom moving with a velocity of $4000\ ms^{-1}$ **is** λ_1**. If the velocity of the hydrogen atom is changed to** $2000\ ms^{-1}$**, the new wavelength** λ_2 **is equal to**

A) $0.25\ \lambda_1$

B) $0.5\ \lambda_1$

C) $2\ \lambda_1$

D) $4\ \lambda_1$

40. Q.Id: 160306

The wave number of the third line of the Balmer series of hydrogen spectrum is [R = Rydberg constant]

A) 0.21 R

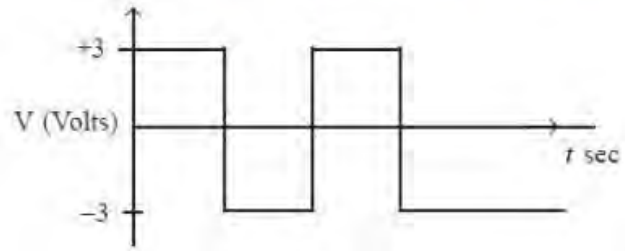
B) 0.138 R

C) 0.18 R

D) 0.22 R

41. Q.Id: 160305

The carrier wave is given by $C(t) = 8\sin(5\pi t)$ **volts and the modulating signal is a square wave as shown in the figure. The modulation index is**



A) 0.6

B) 0.375

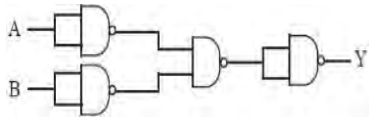
C) 0.75

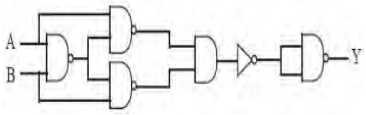
D) 2.67

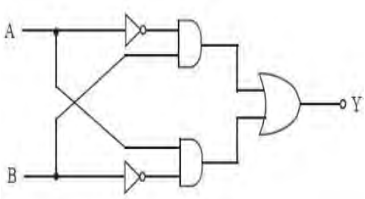
42. Q.Id: 160304

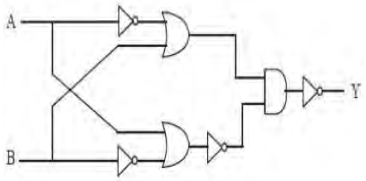
Which of the following logic gate circuit has the following truth table

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

A) 

B) 

C) 

D) 

43. Q.Id: 160303

The logic gate used to realize all other basic gates is

A) AND **B)** NOT

C) NOR **D)** NAND

44. Q.Id: 160302

The ratio of the electric potential energy that a proton in a nucleus experiences to that of an electron is approximately of the order of

A) 10^4 **B)** 10^2

C) 10^6 **D)** 10^8

45. Q.Id: 160300

Consider a beam of electrons directed towards a crystal. if the crystal spacing is 'b', the de-Broglie wavelength for which the electron beam will be reflected back along the same path, n being an integer, is

A) $\frac{2b}{n}$ **B)** 2bn

C) $\frac{b}{2n}$ **D)** b^2n

46. Q.Id: 160299

A neutron and a photon have kinetic energy 100 keV and 50 eV, respectively. The ratio of wavelength of neutron and photon is
(Assume mass of neutron = 1.68×10^{-27} kg, $c=3\times10^{8}$ m/s**).**

A) 3.64×10^{-6}

B) 10.15×10^{-6}

C) 3.65×10^{-5}

D) 10.15×10^{-7}

47. Q.Id: 160298

A 8.8 mW laser is focused to a spot of $1\ mm^2$ **area. If a 3 nC static charge is placed in the focused spot, the maximum electric force experienced by it is [Use** $\in_0=8.8\times10^{-12}C^2/Nm^2$**]**

A) $\sqrt{0.3}\times10^{-6}$ N

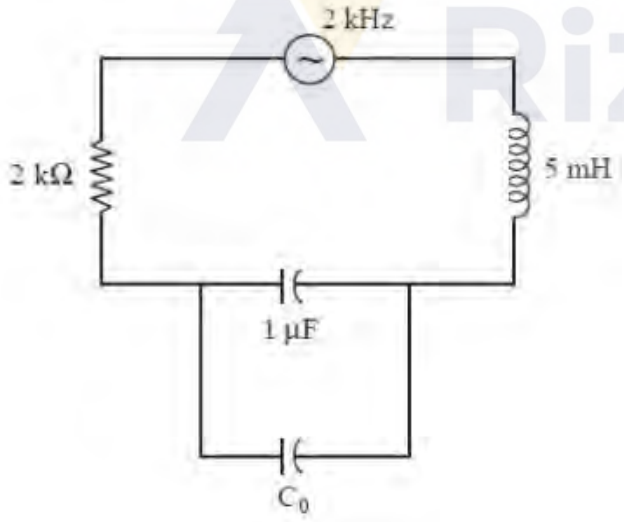
B) $\sqrt{0.6}\times10^{-5}$ N

C) $\frac{1}{\sqrt{3}}\times10^{-5}$ N

D) $2\sqrt{2}\times10^{-5}$ N

48. Q.Id: 160296

In the given LCR current, with AC source of frequency 2 kHz, the capacitance C_0 **of the capacitor added in parallel to** $1\ \mu F$ **capacitor to make the circuit resonant with the source, is**



A) 0.25 μF

B) 0.5 μF

C) 1 μF

D) 1.25 μF

49. Q.Id: 160295

An air core solenoid of length 0.5 m and cross sectional area $25\times10^{-4}\ m^2$ has 500 turns. When the electrical circuit of the winding is opened, the current falls to zero from 10 A in $\pi\times10^{-3}$ seconds. The back emf induced in the circuit in 'V' is (The permeability of free space is given as $4\pi\times10^{-7}\ Tm/A$)

A) 20

B) 15

C) 10

D) 5

50. Q.Id: 160293

A 2000 turns/m solenoid with a core of relative permeability 500 carries a current of 5 A. Then the magnetic field and the magnetization are given respectively as :

A) $8000\times10^{-4}\ T, 8.52\times10^{6}\ A/m$

B) $6280\times10^{-3}\ T, 4.99\times10^{6}\ A/m$

C) $7780\times10^{-3}\ T, 3.29\times10^{6}\ A/m$

D) $5680\times10^{-3}\ T, 2.25\times10^{6}\ A/m$

51. Q.Id: 160290

Consider a long solenoid carrying a current of 10 A. To get a magnetic field strength (B) of 8 mT, the number of turns of the wire needed to wound covering a length of 30 cm is

A) 637

B) 191

C) 300

D) 282

52. Q.Id: 160288

Two electrons with initial speed $8\times10^{6}\ m/s$ are released into a space with magnetic field $\vec{B}$. The first electron is released along the X-axis and it moves in a straight line. The second electron is shot from the origin along the Y-axis and it moves in a circle that intersects the + Z-axis z = + 18 cm. The magnitude and direction of $\vec{B}$ is $\left(m_e=9\times10^{-31}\ kg\right)$

A) $9\times10^{-4}\ T$, -X direction

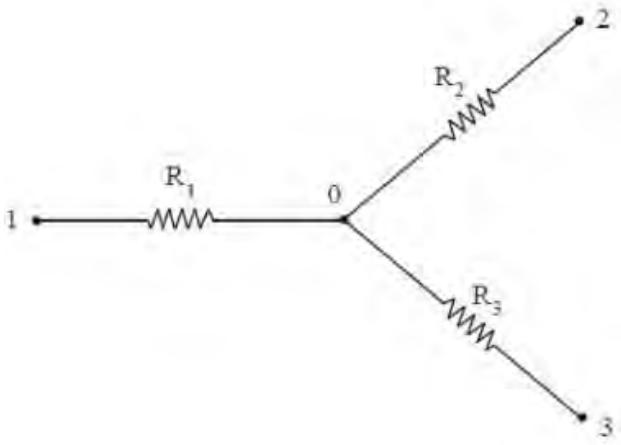
B) $10\times10^{-4}\ T$, -Z direction

C) $10\times10^{-4}\ T$, -X direction

D) $5\times10^{-4}\ T$, +X direction

53. Q.Id: 160283

In the circuit shown, if the potentials at points 1, 2 and 3 are 10 V, 6 V and 5 V respectively and the resistance are $R_1 = 10\ \Omega$, $R_2 = 20\ \Omega$ and $R_3 = 30\ \Omega$. The current flowing through the resistance R_1 is



A) 0.1 A

B) 0.2 A

C) 0.3 A

D) 0.4 A

54. Q.Id: 160183

The ratio of the length of a stretched circular rod to its original length is x. If μ is the Poisson's ratio, the ratio of the electrical resistance of the stretched bar to that of the unstretched bar is

A) $\frac{1-2\mu(x-1)}{x}$

B) $\frac{1-x(1-2\mu)}{x}$

C) $\frac{x}{1-2\mu(x-1)}$

D) $\frac{x}{1-x(1-2\mu)}$

55. Q.Id: 160173

The potential of an electrostatic field $\overline{E} = 2axy\hat{i} + a(x^2 - y^2)\hat{j}$ is

A) $ay\left(\frac{y^2}{3} - 2x^2\right) + c$

B) $\frac{ay^2}{3} - ayx + c$

C) $-\frac{ay^2}{2} + ayx^3 + c$

D) $-ay\left(\frac{y^2}{3}\right) + ayx^3 + c$

56. Q.Id: 160171

Consider a long solid non-metallic cylinder of radius R carrying volume charge density $\rho = kr^2 (r < R)$, where r is the radial distance from the axis and k is a positive constant of appropriate dimension. Then the electric field at a distance r < R from the axis of the cylinder is

A) $\frac{kr}{4\varepsilon_0}\hat{r}$

B) $\frac{kr^2}{4\pi\varepsilon_0}\hat{r}$

C) $\frac{kr^3}{4\pi\varepsilon_0}\hat{r}$

D) $\frac{kr^3}{4\varepsilon_0}\hat{r}$

57. Q.Id: 160167

A laser beam is used to illuminate a double slit. The distance between the slits is 0.93 mm A viewing screen is kept at a distance of 1.2 m from the double slit. If the second order bright fringe (m = 2) is 5.1 cm from the center line, the distance between adjacent bright fringes is

A) 1.5 cm

B) 2.6 cm

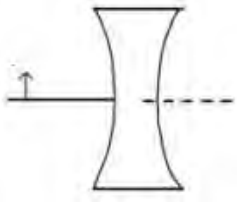
C) 2.8 cm

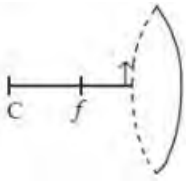
D) 3.2 cm

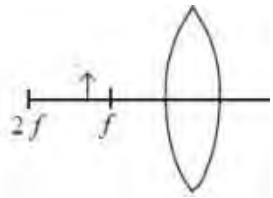
58. Q.Id: 160166

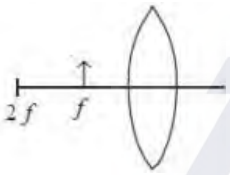
Match the following diagrams with the correct statement

List1 **List2**

A. 

B. 

C. 

D. 

I. Positive magnification, image on the opposite side of the object

II. Positive magnification m > 1

III. Real image

IV. No image

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

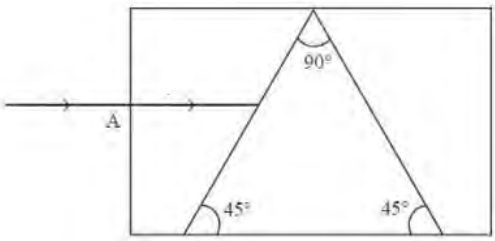
B) A-> III, B-> II, C-> IV, D-> I

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

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

59. Q.Id: 160161

An air gap in the form of a prism as shown in the figure is present inside a glass slab of refractive index 1.8. A ray enters from left side of the slab through face A. Then



A) The ray passes through the slab undeviated

B) The ray exits from the slab bending upwards

C) The ray exits from the slab bending downwards

D) The ray exits from the slab after total internal reflection

60. Q.Id: 160160

Consider a point object moving in the XY plane according to $x = a \sin \omega t$ **and** $y = b \cos \omega t$**, where a, b and** ω **are positive constants. The trajectory equation of the point object is**

A) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

B) $x^2 + y^2 = ab$

C) $\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$

D) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 0$

61. Q.Id: 160142

If the temperature of 50 ml of gas at $27\ ^oC$ **is raised to** $57\ ^oC$ **at constant pressure, the final volume of the gas is**

A) 23.7 ml

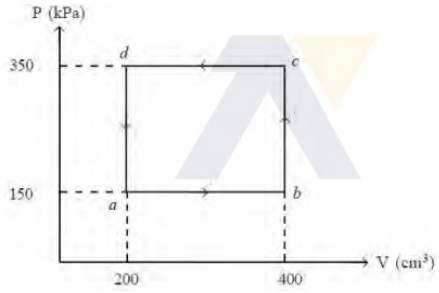
B) 25.0 ml

C) 53.7 ml

D) 55.0 ml

62. Q.Id: 160141

A gas system is taken through the thermodynamic cycle (abcda) as shown in the figure. The amount of heat change experienced by the gas during the process is



A) 40 J of heat is rejected

B) 40 J of heat is absorbed

C) 100 J of heat is rejected

D) 100 J of heat is absorbed

63. Q.Id: 160139

At what temperature will a Fahrenheit thermometer record twice as much temperature as a Centigrade thermometer ?

A) 320^0C

B) 160^0C

C) 80^0C

D) -40^0C

64. Q.Id: 160138

A vessel of volume 40 l contains ideal gas at the temperature $0\ ^{o}C$. After a portion of the gas has been let out, the pressure in the vessel decreased by $\Delta p = 0.78$ atm, while the temperature remaining constant. Assuming the density of the gas under normal conditions as $\rho = 1.3\ g/l$, the mass of the released gas is

A) 30.6 g

B) 15 g

C) 40.6 g

D) 25 g

65. Q.Id: 160136

A wide vessel with a small hole at the bottom is filled with water and kerosene. Neglecting the viscosity, the velocity of water flow, if the thickness of water layer is 30 cm and the thickness of kerosene layer is 20 cm, is

A) 3 m/s

B) 9 m/s

C) 1.73 m/s

D) 1.50 m/s

66. Q.Id: 160134

The Young's modulus of copper wire of 2m length and 5 mm diameter measured by applying a weight of 100 N is $5\ Nm^{-2}$. If the applied weight is increased to 200 N. then the Young's modulus of copper wire is

A) $10\ Nm^{-2}$

B) $5\ Nm^{-2}$

C) $1\ Nm^{-2}$

D) $0.5\ Nm^{-2}$

67. Q.Id: 160133

The amount of work that has to be done to place a 1000 kg satellite into a circular orbit of radius 290 km above the earth's surface is (usenull $G = 6.67 \times 10^{-11}\ Nm^2/kg^2$)

A) 6.27×10^{10} J

B) 3.27×10^{10} J

C) 4.27×10^{10} J

D) 3×10^{10} J

68. Q.Id: 160132

A camera clicks 100 photographs with a shutter speed ofnull of an oscillating pendulum of period 1 sec at random intervals of time. Which of the following statements about these photographs is most likely true ?

A) More images will show the bob vertically below the point of suspension than at the ends

B) More images will show the bob at the end positions

C) There will be roughly equal number of images of the bob positioned vertically below the point of suspension as those depicting the bob at he ends

D) No images will likely have the bob vertically below

69. Q.Id: 160131

The times taken by a solid sphere, a solid cylinder, a time - walled hollow sphere and a thin - walled hollow cylinder, all having the same mass, to roll down an inclined plane when released at the top are denoted as t_{ss}, t_{sc}, t_{hs} and t_{hc} respectively. The following is true with regard to the roll down times

A) $t_{hc} = t_{hs} > t_{sc} > t_{ss}$

B) $t_{hc} > t_{hs} > t_{ss} > t_{sc}$

C) $t_{ss} > t_{sc} > t_{hs} = t_{hc}$

D) $t_{ss} = t_{sc} > t_{hs} = t_{hc}$

70. Q.Id: 160130

A 3kg steel ball hits a concrete wall with a speed of 10 m/s at an angle of 60^o with the surface and bounces off with the same speed and angle. The average force exerted by the ball on the wall, if the ball is in contact with the wall for 0.2 s, is

A) 2.6×10^2 N

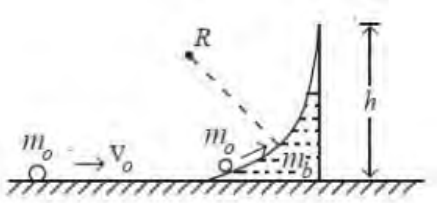
B) 52 N

C) 1.3×10^2 N

D) 5.2 N

71. Q.Id: 160094

A small object of mass m_o moving with a velocity v_o is incident upon the block having a frictionless curved surface of radius R. The block is initially at rest. The object and block move together on the frictionless horizontal surface while the object rolls up to maximum height of h on the curved surface of the block of mass m_b. The value of h is



A) $\frac{1}{g}\left(\frac{m_b}{m_o+m_b}\right)v_o^2$

B) $\frac{1}{g}\left(\frac{m_o+m_b}{m_b}\right)v_o^2$

C) $\frac{1}{2g}\left(\frac{m_o}{m_o+m_b}\right)v_o^2$

D) $\frac{1}{2g}\left(\frac{m_b}{m_o+m_b}\right)v_o^2$

72. Q.Id: 160093

A truck of mass 2000 kg is moving down the hill inclined at an angle 30^o relative to the horizontal. At some point when the truck seed at 72 kmph the driver applies the bikes.

The constant force (parallel to the road) that must act if the truck has to stop after travelling 100 m is (Assume $g = 10\ m/s^2$)

A) 30000 N

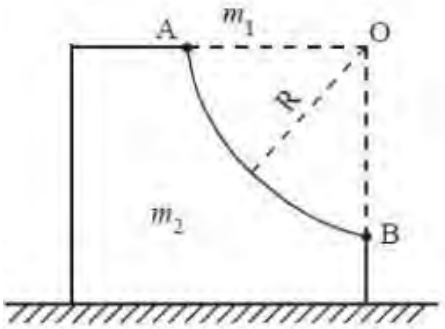
B) 14000 N

C) 25000 N

D) 50000 N

73. Q.Id: 160092

A marble of mass m_1 slides down an arc of circular track from rest as shown in the figure. Assume the track is frictionless. If the block having the track has a mass m_2 and can also slide frictionlessly on the table, the velocity of the particle when it exits the track at B is



A) $\sqrt{gR}$

B) $\sqrt{gR\left(1+\frac{m_1}{m_2}\right)}$

C) $\sqrt{2gR(m_1+m_2)}$

D) $\sqrt{\frac{2gRm_2}{(m_1+m_2)}}$

74. Q.Id: 160090

Two boys, both swim at 2.5 km/h across a river with the water velocity of 2 km/h. First boy starting from point A on one side of the river crosses the river along a straight line path reaching point B on the other side of the river, AB being perpendicular to the stream. The other boy starts from the same point A and swims right angles to the stream and reaches point C on the other side of the river and walks back to the point B with a velocity u. If both boys reach point B at the same time, the value of u is

A) 2 km/h

B) 1 km/h

C) 4 km/h

D) 3 km/h

75. Q.Id: 160087

A ball is thrown with an initial velocity of 100 m/s, at an angle of 30^o above the horizontal.

The distance from the throwing point to the point where the ball attains its original level is approximately

A) 860 m

B) 510 m

C) 1720 m

D) 430 m

76. Q.Id: 160085

A projectile positioned at a point A is fired from ground at an angle $'\theta'$ with respect to ground and after 1 minute it touches the point B on the ground located at a distance 6 km from the point A. The initial velocity of the projectile is

A) 33 m/s

B) 100 m/s

C) 105 m/s

D) 316 m/s

77. Q.Id: 160084

A boat sails on a river against the current from point A to point B and back to point A again.

The boat maintains same velocity in relation to water in both cases. The velocity of water current is 3 km/h. If the ratio of the time the boat takes to sail from point A to point B to point A and the time it would take to cover the same distance on a still lake is 1.5, the velocity of the boat is

A) $4\sqrt{5}$ km/h

B) $6\sqrt{2}$ km/h

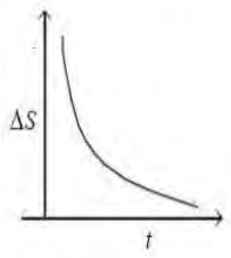
C) $5\sqrt{5}$ km/h

D) $3\sqrt{3}$ km/h

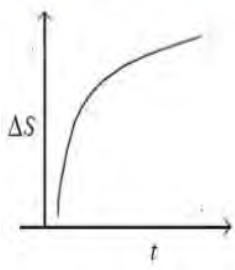
78. Q.Id: 160082

Two stones are thrown vertically up simultaneously from the ground. As they travel upwards, their mutual separation ΔS, as a function of time 't' can be graphically shown to be

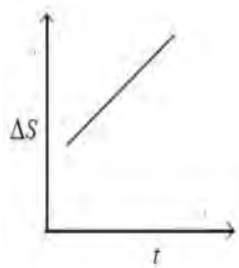
A)



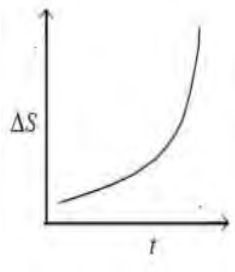
B)



C)



D)



79. Q.Id: 160080

Measured resistance of 5Ω and 10Ω, both having same absolute error, are connected in parallel. If the relative error of the equivalent resistance is not to exceed 0.05, the absolute error in the measurement of each of the resistance in Ω is

A) 0.05

B) 0.1

C) 0.3

D) 0.5

80. Q.Id: 160077

Left alone, the half - life of Protons and Neutrons are almost

A) Infinite and finite respectively

B) Both infinite

C) Both finite

D) Finite and infinite respectively

81. Q.Id: 160070

Statement (S) : Queen bee performs 'Waggle dance' in a bee hive.

Reason (R) : 'Waggle dance' informs other bees about source of nector.

Which of the following is true ?

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

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

C) (S) is true, but (R) is false

D) (S) is false, but (R) is true

82. Q.Id: 160069

The following fish is a good source for omega 3 fatty acids

A) Shrimp

B) Sardine and Salmon

C) Cat fish

D) Silver carp

83. Q.Id: 160068

The first gene therapy was given to

A) Human immuno deficiency

B) Emphysema

C) Adenosine deaminase deficiency

D) Phenyl Ketonurea

84. Q.Id: 160066

Philadelphia chromosome is associated with following disease

A) AIDS

B) Cancer

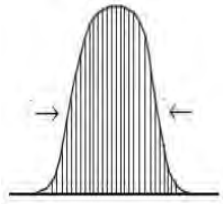
C) Immune hypersensitivity

D) Tuberculosis

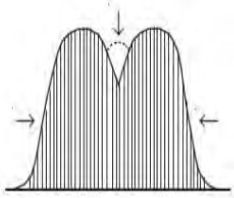
85. Q.Id: 160065

Which of the following schematic diagram best explains showing phenotypic distribution explains the "directional selection" due to natural selection :

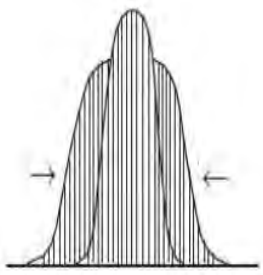
A)



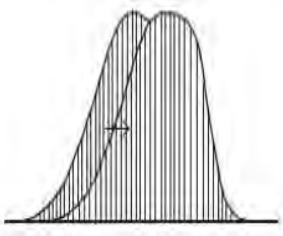
B)



C)



D)



86. Q.Id: 160063

Biochemical recapitulations, is best exemplified by embryonic development of birds. Identify the correct statement

A) Excretion of ammonia for first four days of development as in fishes, urea for next nine days like amphibians and finally uric as in reptiles

B) Excretion of ammonia for first three days as in fishes, urea for seven days as in amphibians and uric as in reptiles

C) Excretion of ammonia for nine days as in fishes, urea for nine days as in amphibians and uric as in reptiles

D) Excretion of ammonia for two days as in fishes, urea for ten days as in amphibians and finally uric as in reptiles

87. Q.Id: 160060

"Development of normal eyes and skin colour in the Proteus anguinus, a cave dwelling salamander, upon exposure to daylight and its subsequent passage to the next generation" supports which of the following evolutary theory

A) Darwinism

B) Neo-Laemarckism

C) Mutation theory

D) Industrial melanism

88. Q.Id: 160058

How many Barr bodies are present in the cells of Klinfelter Male (KM), Normal Male (M) and Normal Female (F) in humans

A) 2(KM), 1(M), 2(F)

B) 1(KM), 0(M), 1(F)

C) 0(KM), 0(M), 1(F)

D) 3(KM), 1(M), 2(F)

89. Q.Id: 160055

Match the following

List1	List2
A. XX - XO Type	I. Drosophila
B. XX - XY Type	II. Grasshopper
C. ZO - ZZ Type	III. Birds
D. ZW - ZZ Type	IV. Fumea

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

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

90. Q.Id: 160054

Match the following

List1	List2
A. R^h Factor	I. Incompatibility between R^h negative mother and growing positive foetus
B. CDE Nomenclature	II. D Antigen
C. Weiner Hypothesis	III. Fisher and Race System
D. Erythroblastosis foetalis	IV. Existence of 8 Alleles

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

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

91. Q.Id: 160053

Which one of the following is not caused by pleiotropic alleles ?

A) Phenyl ketonuria **B)** Sickle cell Anaemia

C) Muscular dystrophy **D)** Cystic Fibrosis

92. Q.Id: 160051

Cervical cancer is caused by

A) Herpes Simplex Virus

B) Human Papilloma Virus

C) Trichomonas Vaginalis

D) Treponema Pallidum

93. Q.Id: 160050

Sperm is produced in the testes and is being transported through the following organs :

a) Urethra

b) Epididymus

c) Vas deferens

d) Vagina of the female

e) Ejacuatory duct

f) Seminiferons tubules

g) Rete restis

The correct passage of sperm

A) f → b → g → c → e → a → d

B) b → f → g → c → e → a → d

C) g → f → c → b → e → a → d

D) f → g → b → c → e → a → d

94. Q.Id: 160045

Statement (S) : AIDS virus has single strand DNA as a genetic material

Reason (R) : Reverse transcriptase enzyme makes AIDS viral DNA in the host cell

Which of the following is true ?

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

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

C) (S) is true, but (R) is false

D) (S) is false, but (R) is true

95. Q.Id: 160044

Match the following

List1	List2
A. Peptide hormone	I. Parathyroid
B. Amine hormone	II. Estrogen
C. Steroid hormone	III. Oxytocin
D. Protein hormone	IV. Thyroxine

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

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

96. Q.Id: 160040

Which of the following is called gyroscope of the body ?

A) Cerebellam **B)** Medulla oblongata

C) Ponsvarolii **D)** Mesencephalon

97. Q.Id: 160038

An autoimmune disorder affecting the neuromuscular junctions leading to fatigue

A) Muscular dystrophy **B)** Myasthenia gravis

C) Gout **D)** Tetany

98. Q.Id: 160036

Which of the three following hormones is crucial for regulating the salt and water balance in the body ?

A) Vasopressin, angiotensin - II and aldosterone **B)** Cortisol, aldosterone and renin

C) Anti - diurretic hormone, prolactin and aldosterone **D)** Angiotensin - II, thyroxin and aldosterone

99. Q.Id: 160032

The following characteristic features of circulatory system and heart types were found different animals, A and B

A) Deoxygenated and oxygenated bloods are received by the heart separately but mixed blood will be pumped out from the heart

B) The oxygenated and deoxygenated bloods are received by the heart and the unmixed blood is pumped out separately

i) Double circulation and 3-chambered heart

ii) Incomplete double circulation and 4-chambered heart

iii) Double circulation and 4-chambered heart

iv) Incomplete double circulation and 3-chambered heart

Which of the following condition is correct ?

A) A-> i, B-> ii

B) A-> iii, B-> iv

C) A-> iv, B-> iii

D) A-> ii, B-> iv

100. Q.Id: 160030

The pH of blood is about 7.4 and is maintained by

A) Monocytes

B) Platelets

C) Leuocytes

D) Red Blood Cells

101. Q.Id: 160029

Which of the following gastric glands produce gastrin hormone

A) Cardiac gland

B) Pyloric gland

C) Oxyntic gland

D) Fundic glands

102. Q.Id: 160028

Statement (S) : Diapause is the phenomenon in which certain organisms spend some time in a state of inactiveness

Reason (R) : It is a mechanism of survial under extreme temperature and drought

Which of the following is true ?

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

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

C) (S) is true, but (R) is false

D) (S) is false, but (R) is true

103. Q.Id: 160025

During summer the density of the surface of the water decreases due to increase in its temperature. The upper most warm layer of a lake is called

A) Thermocline

B) Metaimnion

C) Hypolimnion

D) Epilimnion

104. Q.Id: 160023

Statement (S) : The animals which live in colder regions have larger body size with greater body mass

Reason (R) : The small surface area does not help to conserve heat

Which of the following is true ?

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

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

C) (S) is true, but (R) is false

D) (S) is false, but (R) is true

105. Q.Id: 160021

Match the following

List1	List2
A. Phallomers	I. Nitrogenous waste disposal
B. Taenidia	II. Copulation
C. Cuticle	III. Prevents trachea from collapsing
D. Ostia	IV. Blood passage

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

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

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

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

106. Q.Id: 159981

Cockroach is a cursorial insect and runs on the smooth surfaces using 'A' and runs on the rough surfaces using 'B' parts of the body. What are 'A' and 'B' ?

A) A - Claws and arolium ; B - Plantulae

B) A - Plantulae ; B - Claws and arolium

C) A - Pivot ; B - Cibarium

D) A and B - Claws only

107. Q.Id: 159978

Which of the following enzyme converts starch into disaccharides

A) Invertase

B) Amylase

C) Cellulase

D) Protease

108. Q.Id: 159977

The only drug effective in the treatment of filariasis, hetrazon was discovered by

A) Alfred Sherwood Romer

B) Yellapragada Subba Rao

C) M.S. Swaminathan

D) William Kirby

109. Q.Id: 159975

Statement (S) : The eggs of Ascaris are described as 'mammillated eggs'

Reason (R) : These eggs are passed out with faecal mater and infect man via contaminated food and water

Which of the following is true ?

A) (S) is true, but (R) is false

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

C) (S) is false, but (R) is true

D) Both (S) and (R) are true and (R) is the correct explanation of (R)

110. Q.Id: 159973

Match the following

List1	List2
A. Morphine	I. Depressant
B. Heroin	II. Stimulates of central nervous system
C. Cannabinoids	III. Sedative and pain killer
D. Cocaine	IV. Effect on the cardio vascular system

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

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

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

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

111. Q.Id: 159971

Statement (S) : Transverse binary fission seen in paramecium is also considered as homothetogenic fission

Reason (R) : The plane of fision is at obtuse angle to the longitudinal axis of the body

Which of the following is true ?

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

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

C) (S) is true, but (R) is false

D) (S) is false, but (R) is true

112. Q.Id: 159968

Which of the following bear a flagellum without lateral appendages and the terminal part of the axonema is naked without the outer sheath at its tip

a) Peranema

b) Monas

c) Polytoma

d) Chlamydomonas

A) a, c

B) b, d

C) a, b

D) c, d

113. Q.Id: 159966

Match the following

List1	List2
A. Harderian gland	I. Skin
B. Sudoriferous gland	II. at the base of the tail
C. Preen gland	III. Ear
D. Ceruminous gland	IV. Eye
E. .	V. Brain

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

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

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

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

114. Q.Id: 159965

Which one of the following characters is not correct with respect to Ratitae

A) Flightless birds

B) Sternum without keel

C) Syrinx, clavicles are present

D) Males have penis

115. Q.Id: 159964

Statement (S) : The foot of siphonopoda is modified into 8 or 10 arms. A part of the foot is also modified into a siphon

Reason (R) : The modification of foot into siphon facilitates to escape from the predators

Which of the following is true ?

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

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

C) (S) is true, but (R) is false

D) (S) is false, but (R) is true

116. Q.Id: 159963

Match the following with reference to earthworm

List1	**List2**
A. $4-6^{th}$ segments	I. Cingulum
B. $14-16^{th}$ segments	II. Stomoch
C. $9-14^{th}$ segments	III. Blood glands
D. $10-11^{th}$ segments	IV. Testes

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

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

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

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

117. Q.Id: 159962

Which of the following type of neurons are found in the 'retina' of humans

A)

B)

C)

D)

118. Q.Id: 159961

The first animals which exhibit "Tube with in in a tube" organisation are

A) Acoelomates

B) Pseudocoelomates

C) Enterocoelomates

D) Schizocoelomates

119. Q.Id: 159960

Match the following species with their scientific name :

List1	List2
A. The black buck	I. Ailurus ochraceus
B. Pygmy hog	II. Antelope cervicapra
C. Kashmir stag	III. Sus salvanius
D. Red Panda	IV. Cervus elaphus hanglu

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

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

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

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

120. Q.Id: 159959

Which of the following is an acoelomate

A) Ascaris lumbricoids

B) Taenia solium

C) Enterobius

D) Nereis

121. Q.Id: 159882

Micro-propagation is useful

i) To recover healthy plants

ii) To generate new species

iii) To multiply genetically uniform population

iv) To produce heterozygous plant

The correct combination is

A) i & ii

B) i & iii

C) ii & iiii

D) iii & iv

122. Q.Id: 159881

Match the crop varieties developed by hybridization and selection, with the corresponding diseases they are resistant to

List1	List2
A. Brassica - Swarnim	I. Black rot
B. Cowpea - Komal	II. Leaf curl
C. Cauliflower - Shubhra	III. White rust
D. Chilli - Sadabahar	IV. Bacterial blight
E. .	V. Stripe rust

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

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

123. Q.Id: 159880

Following are some of the biosafety and ethical issues of genetically engineered crop plants :

i) There is no fear of transferring allergins or toxins to humans as side effects since specific genes are slected.

ii) There is a risk of gene pollution due to transfer of the new genes into wild-type plants.

iii) Transgenic pose a harmful effect on biodiversity and have an adverse impact on environment.

iv) There is no risk of changing the fundamental nature of crop plants.

The correct combination is

A) i, ii, iv & iii **B)** i, iii & iv

C) ii & iii **D)** i & iv

124. Q.Id: 159879

The some of the following are the desirable features to facilitate cloning of a DNA insert into a vector

i) BamHI site

ii) Selectable marker

iii) Ori

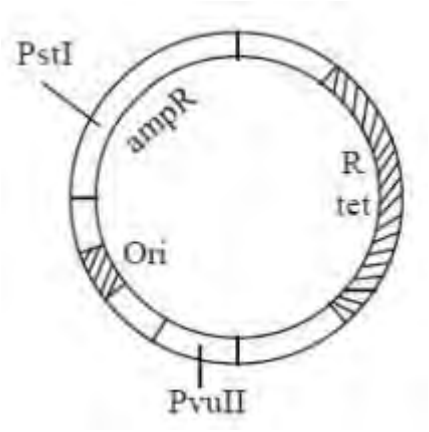
iv) High molecular weight

The correct combination is

A) i & ii **B)** ii & iii

C) iii & iv **D)** i & iii

125. Q.Id: 159878



The larger DNA fragment which is resulted upon digestion of PBR322 using PstI and PvuII is ligated with a DNA insert and transformed to E.coil cells.
Assertion (A) : E.coil colonies harbouring recombinant vector cannot be obtained on tetracyclin-agar plates on spreading.
Reason (R) : Because, part of the amp^R gene has been deleted while cloning the insert.
Which of the following is true ?

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

126. Q.Id: 159877

Read the following statements and choose the correct option.
(i) Tailing : addition of adenylate residues at 5'-end in a template independent manner
(ii) Promotor : Is the site recognised by the RNA polymerase in association with'ρ' factor
(iii) Division of labour : RNA polymerase I and RNA polymerase III are responsible for 18S rRNA and tRNA transcription respectively
(iv) Capping : Addition of methyl guanosine triphosphate at the 5'-end of hn - RNA
The correct combination is

A) i & ii

B) ii & iii

C) iii & iv

D) ii & iv

127. Q.Id: 159876

Which one of the following statements is correct ?

A) The energy required for replication of DNA is not from deoxyribonucleotide triphosphate

B) Replication of leading strand is discontinuous process

C) Replication of lagging strand is continuous process

D) RNA primer is required for initiation of DNA replication

128. Q.Id: 159875

Assertion (A) : DNA is a long polynucleotide chain composed of four different nitrogen bases : A, T, U & C.

Reason (R) : The stacking of base pairs one over the other and the pairing of bases from two strands through hydrogen bonds stabilize the double helical structure of DNA.

Which of the following is true ?

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

129. Q.Id: 159874

A cross between homozygons red-flowered plant and a homozygous green flowered plant resulted in a yellow flowered F_1 plant. The phenomenon is

A) Co-dominance

B) Incomplete dominance

C) Epistasis

D) Dominance

130. Q.Id: 159873

In order to know the genotype of a dominant phenotype, it is crossed with a recessive parent. The cross resulted in 50% of recessive phenotypes. The genotype of the dominant phenotype used in the test cross is

A) Ww

B) WW

C) ww

D) incomplete dominant genotype

131. Q.Id: 159872

Assertion (A) : Lamba phages cause lysis and death of the host cells, when they multiply.

Reason (R) : Phage DNA upon penetration into E.Coil cells get integrated into the bacterial DNA and remains inactive.

Which of the following is true ?

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

132. Q.Id: 159871

Assertion (A) : For cell-to-cell contact, the donor cell designated F^+ produces the pilus that makes contact with the recipient cell known as an F^- cell.

Reason (R) : The donor cell is called F^- because it produces the pilus.

Which of the following is true ?

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

133. Q.Id: 159870

Match the following

List1	List2
A. Gibberellins	I. Release of volatile substance from ripened fruits
B. Skoog and Miller	II. Bakanae disease
C. Cousins	III. Auxin
D. Naphthaleneacetic acid	IV. Induction of dormancy
E. .	V. A modified form of adenine, a purine.

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

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

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

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

134. Q.Id: 159869

The chemical reaction which results in respiratory ratio of 0.7 is

A) Oxalosuccinic acid $\rightarrow \alpha-$ ketoglutaric acid $+CO_2$

B) $\text{Tripalmitin} + O_2 \rightarrow CO_2 + H_2O + \text{Energy}$

C) $\text{Pyruvic acid} + \text{CoA} + NAD^+ \rightarrow \text{Acetyl CoA} + CO_2 + NADH + H^+$

D) $\text{Glucose} + O_2 \rightarrow CO_2 + H_2O + \text{Energy}$

135. Q.Id: 159868

The conversion of 1, 3 - Biphosphoglyceric Acid (BPGA) to Phosphoglyceric Acid (PGA) is an

A) Energy releasing process

B) Energy requiring process

C) autotrophic process

D) endothermal process

136. Q.Id: 159867

One of the following combinations is correct with reference to photosynthesis

A) C_3 pathway, PEP, RuBisCo

B) Pea, RuBP, RuBisCo

C) Maize, RuBP, Mesophyll cell

D) Pea, PEP, PEP carboxylase

137. Q.Id: 159866

In Calvin cycle interconversion of G-3-P and DHAP is catalysed by

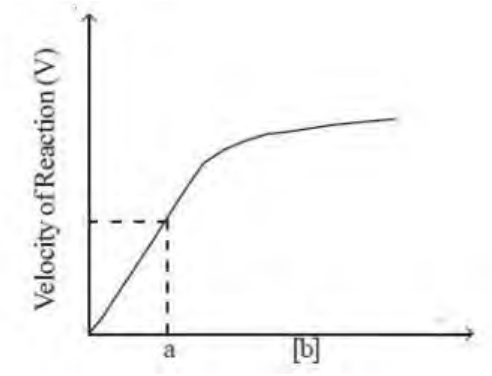
A) Transketolase

B) Aldolase

C) Triose phosphate isomerase

D) Ribose - 5 - phosphate isomerase

138. Q.Id: 159865



In the above figure representing an enzyme catalysed reaction 'a' and 'b' respectively are

A) Michaelis Menten constant and substrate concentration

B) $\frac{1}{2}V_{max}$ and K_m

C) $\frac{1}{2}V_{max}$ and substrate concentration

D) K_m and [E]

139. Q.Id: 159864

Bronzing in legumes and whiptail in cauliflower are the physiological diseases caused due to the deficiency of the micronutrients.

i) Cu ii) B

iii) Cl iv) Mo

The correct order of combination

A) i and ii respectively

B) ii and iii respectively

C) iii and iv respectively

D) i and iv respectively

140. Q.Id: 159863

Assertion (A) : Apoplastic path of water is considered to be non-living path.

Reason (R) : In apoplastic pathway, water does not move through intercellular spaces or through the space between cell wall and plasma membrane.

Which of the following is true ?

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

141. Q.Id: 159860

Following are some of the measures taken to protect pollinators

i) Reducing the level of pesticide usage

ii) Discouraging the cultivation of native flowering plants

iii) Encouraging the planting of native flowers plants in open spaces

iv) Discouraging bee boards and bee boxes

The correct combination is

A) ii & iv

B) i & ii

C) i & iii

D) iii & iv

142. Q.Id: 159858

Match the following

List1	List2
A. Amphibious plants	I. Tribulus
B. Submerged suspended hydrophytes	II. Barley
C. Mesophytes	III. Sagittaria
D. Xerophytes	IV. Lemna
E. .	V. Utricularia

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

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

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

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

143. Q.Id: 159857

One of the following statements is not true with reference to the complex tissue Xylem.

A) It is a conducting tissue for water and minerals from leaves and stems to roots.

B) It provides mechanical strength to plant parts.

C) It is composed to tracheids, vessels, fibres and parenchyma.

D) Tracheids do not possess protoplasm.

144. Q.Id: 159856

The cross section of a specimen showed more than six vascular bundles distributed throughout the ground tissue under microscope. The specimen belongs to

A) Dicot leaf

B) Dicot stem

C) Monocot stem

D) Monocot Root

145. Q.Id: 159853

Match the following

List1	List2
A. Condensation phase actually is the interval between Mitosis and initiation of DNA replication	I. M - Phase
B. Decondensation phase in which synthesis proteins takes place in preparation for mitosis	II. S - Phase
C. Replication in which the amount of DNA per cell doubles	III. G_1 - Phase
D. Quiescent stage or inactive stage	IV. G_2 - Phase
E. .	V. G_0 - Phase

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

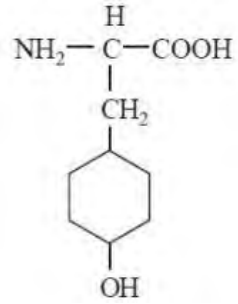
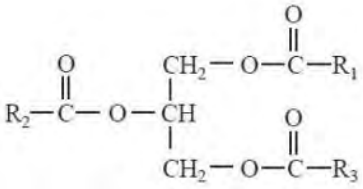
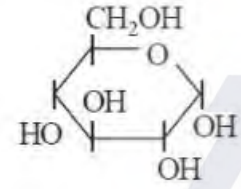
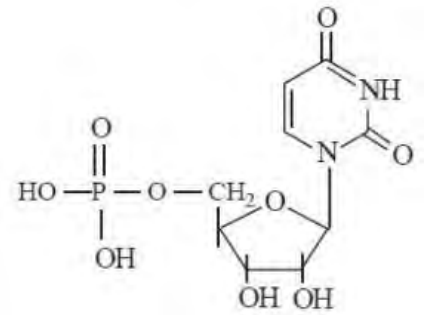
B) A-> I, B-> III, C-> II, D-> V

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

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

146. Q.Id: 159847

Match the subunit components from List - I to the corresponding Macromolecules from List - II.

List1	List2
A. 	I. Lipid
B. 	II. Starch
C. 	III. Protein
D. 	IV. RNA
E. .	V. DNA

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

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

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

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

147. Q.Id: 159841

Study the following lists

List1	List2
A. Mesophyll cells	I. Branched and long
B. Tracheid cells	II. Amoeboid shaped
C. Nerve cells	III. Round and oval
D. White blood cells	IV. Elongated
E. .	V. Long and narrow

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

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

148. Q.Id: 159836

Solanaceae family plants are known for

i) Rhizobial association with roots

ii) Production of cigarettes from leaves

iii) Numerous stamens

iv) Seeds are endospermic

The correct combination is

A) ii & iii **B)** iv & i

C) iv & ii **D)** iii & i

149. Q.Id: 159834

The following partial floral formula "Brl, ⊕, P, G" was derived during identification of a plant. These features indicate that the flower possess

i) Bracteoles

ii) Inferior ovary

iii) Petals

iv) Two equal radial halves when cut in any radial plane allowing to pass through centre of flower.

The correct answer is

A) i & ii **B)** ii & iii

C) ii & iv **D)** i & iv

150. Q.Id: 159831

Identify the false statements :

i) Endosperm is triploid filled with reserved food and nourishes the developing embryo.

ii) The process of formation of pollengrains from megaspore mother cell is called megasporogenesis.

iii) Two nuclei are formed from functional megaspore by mitotic division and move to the opposite poles of embryosac.

iv) At maturity, a typical angiosperm embryosac contains 7 nuclei and 8 cells.

A) i & iii

B) ii & iv

C) i & ii

D) iii & iv

151. Q.Id: 159829

Read the following statements :

i) Pollen grains contain a thin outer layer exine made up of sporopollenin.

ii) Sporopollenin is an organic material resistant to high temperature and strong acids.

iii) Pollen grains are preserved as fossils.

iv) Consumption of pollen products does not increase the performance of athletes.

The correct combination is

A) i & ii

B) ii & iv

C) ii & iii

D) i & iii

152. Q.Id: 159824

Assertion (A) : In some plants, the seeds germinate while still attached to the mother plant.

Reason (R) : It is a strategy to lower the abiotic stress and to ensure successful establishment of plantlet.

Which of the following is true ?

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: 159597

Match the following

List1	List2
A. Jasmine	I. Monochasial cyme
B. Solanum	II. Dichasial cyme
C. Nerium	III. Polychasial cyme
D. Ipomoea	IV. Cymule
E. .	V. Solitary cyme

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

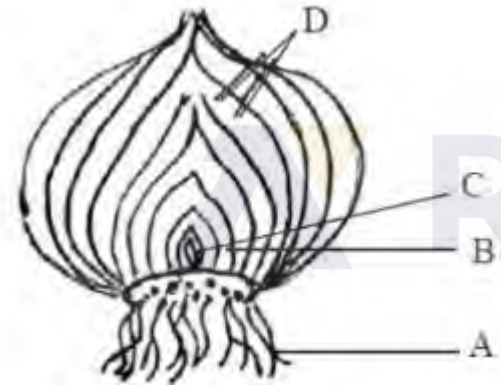
B) A-> IV, B-> I, C-> III, D-> II

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

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

154. Q.Id: 159596

Identify the different parts of bulb of Onion.



A) A : Adventitious root B : Stem
C : Apical bud D : Scale leaf

B) A : Scale leaf B : Apical bud
C : Axillary Bud D : Base of scape

C) A : Adventitious root B : Axillary Bud
C : Apical Bud D : Fleshy scale leaf

D) A : Fibrous root B : Axillary Bud
C : Apical Bud D : Base of scape

155. Q.Id: 159594

Match the following

List1	List2
A. Oryza	I. Hesperidium
B. Anacardium	II. Dehiscent
C. Datura	III. Indehiscent
D. Tridax	IV. Caryopsis
E. .	V. Cypsela

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

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

156. Q.Id: 159593

Members of Phaeophyceae posses

i) Gelatinous coating of algin

ii) Unequal and lateral flagellae

iii) Pyrenoids

iv) Phycobilisomes

A) i & iii **B)** i & ii

C) iii & iv **D)** ii & iv

157. Q.Id: 159592

The major pigments present in the members of Rhodophyceae are

A) Chlorophyll a, c and Carotenoids **B)** Chlorophyll a and b

C) Chlorophyll a, d and Phycoerythrin **D)** Chlorophyll a and Phycocyanin

158. Q.Id: 159591

The following plants are associated with human health care and Bio-diesel production respectively.

A) Jatropa and Chlorella **B)** Rubber and Pongamia

C) Chlorella and Arnica **D)** Digitalis and Jatropa

159. Q.Id: 159590

Edible fruiting bodies called basidiocarps are produced by

A) Saccharomyces

B) Claviceps

C) Puccinia

D) Agaricus

160. Q.Id: 159589

The genus Soanum includes the following species.

i) S. melongena

ii) S. indica

iii) S. aestivum

iv) S. nigrum

The correct answer is

A) i & ii

B) i & iv

C) ii & iii

D) iii & iv