NEET 2020
FULL TEST-7

CHEMISTRY , PHYSICS, BIOLOGY

Time : - 3 Hours   **Max. Marks:- 720**   **Date : ....**

INSTRUCTIONS :

1. The test is of 3 hours duration.

2. The Test Booklet consists of 180 questions. The maximum marks are 720.

3. There are three parts in the question paper A, B, C consisting of Chemistry, Physics having 45 questions each and Biology having 90 questions of equal weightage. Each question is allotted 4 (four) marks for each correct response. ¼ (one fourth) marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.

4. There is only one correct response for each question. Filling upmore than one response in each question will be treated as wrong response and marks for wrong response will be deducted accordingly.

Name : ....

Address : ....

....

Phone/Mobile No. ....

Roll No. ....

PART A – CHEMISTRY

Q.1 Nitrogen gas was collected over water at a temperature of 40°C, and the pressure of the sample was measured at 796 mm Hg. If the vapour pressure of water at 40°C is 55 mm Hg, what is the partial pressure of the nitrogen gas?
(1) 55 mm Hg   (2) 741 mm Hg
(3) 756 mm Hg   (4) 796 mm Hg

Q.2 When pure sodium is placed in an atmosphere of chlorine gas, the following spontaneous reaction occurs. $2\,Na(s) + Cl_2(g) \rightarrow 2\,NaCl(s)$
Which of the following statements is true about the reaction? I. $\Delta S > 0$; II. $\Delta H < 0$; III. $\Delta G > 0$
(1) I only   (2) II only
(3) I and II only   (4) II and III only

Q.3 What is the boiling point of a 2 m solution of NaCl in water? (The boiling point elevation constant, k_b, for water is 0.5°C/m)
(1) 100°C   (2) 101°C
(3) 102°C   (4) 103°C

Q.4 $2\,HI\,(g) + Cl_2\,(g) \rightleftharpoons 2\,HCl(g) + I_2\,(g) + energy$
A gaseous reaction occurs and comes to equilibrium as shown above. Which of the following changes to the system will serve to increase the number of moles of I_2 present at equilibrium?
(1) Increasing the volume at constant temperature.
(2) Decreasing the volume at constant temperature.
(3) Adding a mole of inert gas at constant volume.
(4) Decreasing the temperature at constant volume.

Q.5 $A + B \rightarrow C$. Based on the following experimental data, what is the rate law for the hypothetical reaction given above?

Experiment	[A] (M)	[B] (M)	Initial Rate of Formation of C (M/sec)
1	0.20	0.10	2.0×10^{-6}
2	0.20	0.20	4.0×10^{-6}
3	0.40	0.40	1.6×10^{-5}

(1) Rate = k [A]   (2) Rate = k $[A]^2$
(3) Rate = k [B]   (4) Rate = k [A] [B]

Q.6 A σ bonded molecule MX_3 is T-shaped. The number of non-bonding pairs of electrons is
(1) 0
(2) 2
(3) 1
(4) Can be predicted if atomic number of M is known.

Q.7 When p-character of hybridised orbital (formed by s and p orbitals) increases. Then the bond angle
(1) Decreases   (2) Increases
(3) Becomes twice   (4) Remains unaltered

Q.8 What is the correct IUPAC name for the compound as shown?
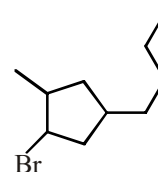
(1) 3-bromo-1-butyl-4-methylcyclopentane
(2) 1-bromo-4-butyl-2-methylcyclopentane
(3) 1-(3-bromo-4-methylcyclopentyl)butane
(4) 4-bromo-1-butyl-3-methylcyclopentane

Q.9 The compound containing co-ordinate bond is:
(1) H_2SO_4 (2) O_3
(3) SO_3 (4) All of these

Q.10 Which is used in purification of air in the spacecraft.
(1) Slaked lime   (2) Quick lime
(3) Potassium superoxide (4) $CaCl_2$

Q.11 H_2 gas cannot be prepared by
(1) Be + NaOH   (2) Na + NaOH
(3) Mg + NaOH   (4) By (2 & 3) method
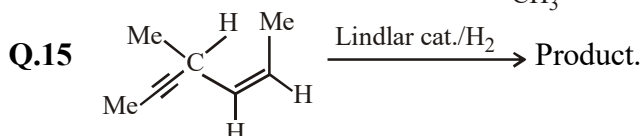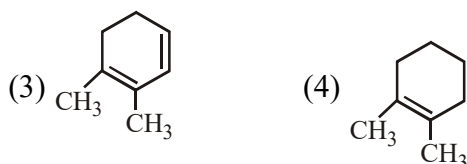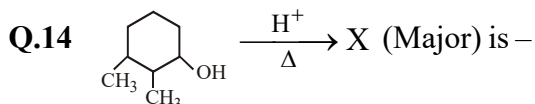
Q.12 Temporary unstable hardness of water due to presence of :
(1) $CaCl_2$, $MgSO_4$
(2) Ca^{+2}, Mg^{+2}
(3) K^+, $CaCO_3$
(4) $Ca(HCO_3)_2$, $Mg(HCO_3)_2$

Q.13 Bleaching action of H_2O_2 is due to its
(1) Oxidising nature   (2) Reducing nature
(3) Acidic nature   (4) Thermal instability

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Q.14

 $\xrightarrow[\Delta]{H^+}$ X (Major) is –

(1)

(2)

(3)
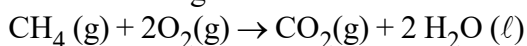
(4)

Q.15

 $\xrightarrow{\text{Lindlar cat./H}_2}$ Product.

Product will be –
(1) An optically active compound.
(2) An optically inactive compound.
(3) A racemic mixture
(4) A diasteromeric mixture

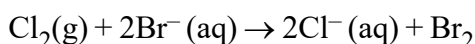**Q.16** $C(s) + 2 H_2(g) \rightarrow CH_4(g) \; ; \; \Delta H° = x$

$C(s) + O_2(g) \rightarrow CO_2(g) \; ; \; \Delta H° = y$

$H_2(g) + \dfrac{1}{2} O_2(g) \rightarrow H_2O(\ell) \; ; \; \Delta H° = z$
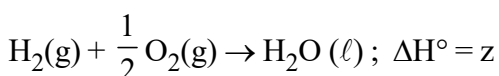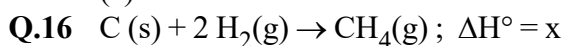
Based on the information given above, what is $\Delta H°$ for the following reaction?

$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2 H_2O(\ell)$

(1) $x + y + z$
(2) $x + y - z$
(3) $z + y - 2x$
(4) $2z + y - x$

Q.17 Consider the reaction

$Cl_2(g) + 2Br^-(aq) \rightarrow 2Cl^-(aq) + Br_2$

The emf of the cell when

$[Cl^-] = [Br_2] = [Br^-] = 0.01$ M and Cl_2 gas at 1 atm pressure will be (E° for the above reaction is = 0.29 volt)

(1) 0.54 volt
(2) 0.35 volt
(3) 0.24 volt
(4) –0.29 volt

Q.18 Which of the following is an uncommon hydrolysis product of XeF_2 and XeF_4?

(1) Xe
(2) XeO_3
(3) HF
(4) O_2

Q.19 Which of the following is **incorrect**?
(1) O_2 is weaker oxidant than O_3.
(2) O_2 has small bond length than O_3
(3) Both O_2 and O_3 are paramagnetic.
(4) O_3 is angular in shape.

Q.20 Which one of the following nitrates will leave behind a metal on strong heating?
(1) Copper nitrate
(2) Manganese nitrate
(3) Silver nitrate
(4) Ferric nitrate

Q.21 The hybridisation of Xe and the number of lone pairs of electrons on it in XeF_6 are –
(1) sp^3d^2, 1
(2) sp^3d^3, 2
(3) sp^3d^2, 2
(4) sp^3d^3, 1

Q.22 X is a non-volatile solute and Y is a volatile solvent. The following vapour pressures are observed by dissolving X in Y.

| X / mol L^{-1}	Y / mm of Hg
0.10	p_1
0.25	p_2
0.01	p_3

The correct order of vapour pressures is
(1) $p_1 < p_2 < p_3$
(2) $p_3 < p_2 < p_1$
(3) $p_3 < p_1 < p_2$
(4) $p_2 < p_1 < p_3$

Q.23 Which of the following is true of a reaction that is spontaneous at 298 K but becomes non-spontaneous at a higher temperature?
(1) $\Delta S°$ and $\Delta H°$ are both negative.
(2) $\Delta S°$ and $\Delta H°$ are both positive.
(3) $\Delta S°$ is negative, and $\Delta H°$ is positive.
(4) $\Delta S°$ is positive, and $\Delta H°$ is negative.

Q.24 Predict the product formed in highest yield in the following reaction:

 $\xrightarrow[\text{H}_2\text{SO}_4]{\text{H}_2\text{O}}$

(1) I
(2) II
(3) III
(4) IV
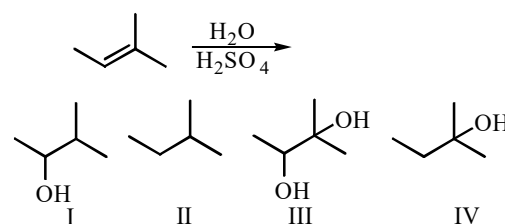
Q.25 What is the relationship between the two substituents on the benzene ring as shown:
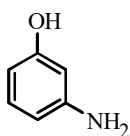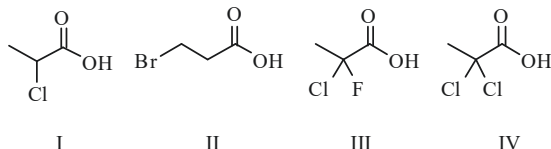

(1) ortho   (2) meta
(3) para   (4) geminal

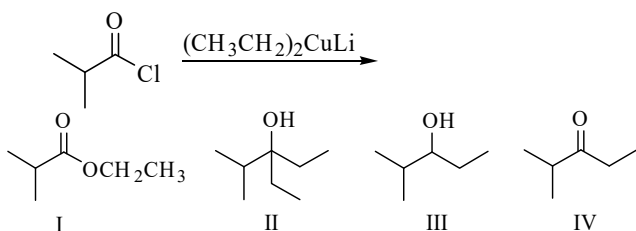**Q.26** An alkoxide ion will react with an alkyl halide to form what type of compound?
(1) alcohol   (2) ether
(3) aldehyde   (4) alkene

Q.27 Which compound shown will have the lowest pKa?

(1) I   (2) II
(3) III   (4) IV

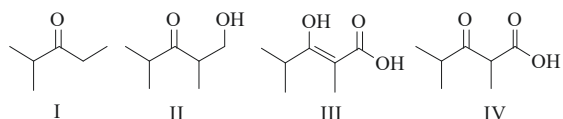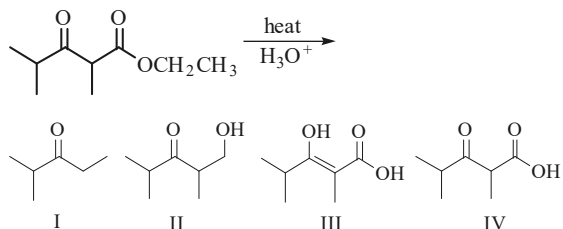**Q.28** What is the product of the following reaction?

(1) I   (2) II
(3) III   (4) IV

Q.29 Which statement concerning the acetoacetic ester synthesis below is not true?
(1) The enolate of β-ketoester is a good nucleophile.
(2) The ester product can be hydrolyzed and decarboxylated.
(3) The enolate anion will attack methyl, primary, secondary and tertiary alkyl halides.
(4) After attack of the enolate on the electrophile, the initial product is a β-ketoester.

Q.30 What is the product of the reaction shown?

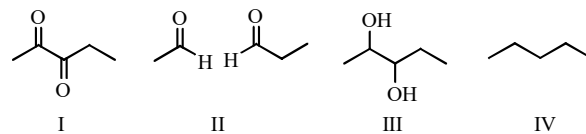I   II   III   IV
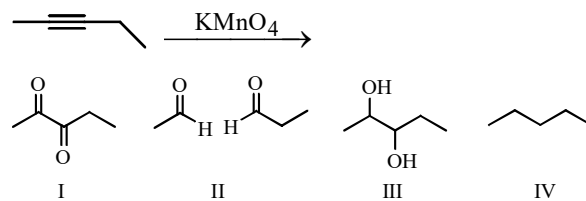
(1) I   (2) II
(3) III   (4) IV

Q.31 What is the major product of the following reaction?

1. (bromo compound)
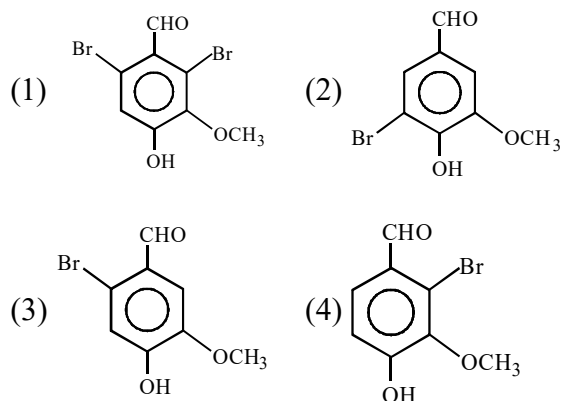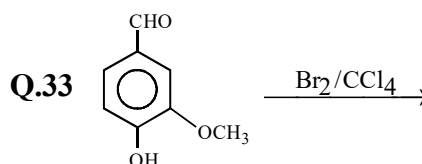2. n-BuLi
3. (ketone)
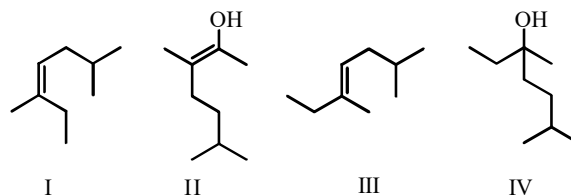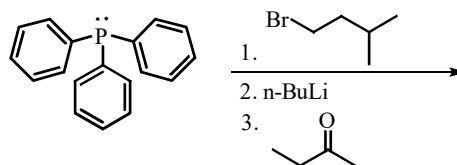
I   II   III   IV

(1) I   (2) II
(3) III   (4) IV

Q.32 What is the product of the reaction shown?

$KMnO_4$

I   II   III   IV

(1) I   (2) II
(3) III   (4) IV

Q.33

Br_2/CCl_4

(1)   (2)   (3)   (4)

Q.34
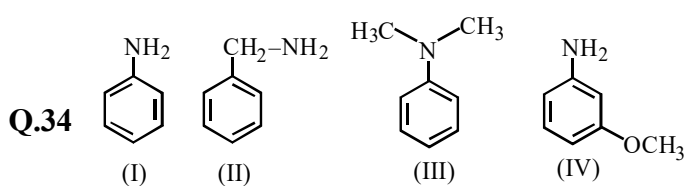
(I)   (II)   (III)   (IV)
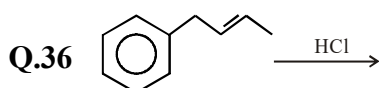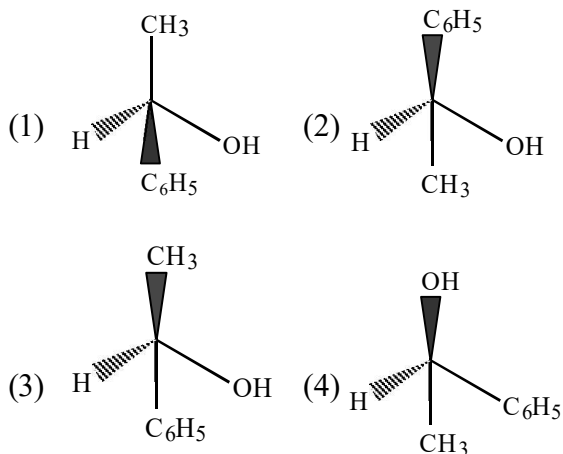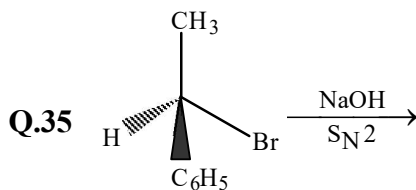
Correct order of Basic strength
(1) I > II > III > IV   (2) II > III > I > IV
(3) III > II > I > IV   (4) IV > I > II > III

Q.35

$\xrightarrow[S_N 2]{NaOH}$

(1)   (2)

(3)   (4)

Q.36

$\xrightarrow{HCl}$

(1)   (2)

(3)   (4)
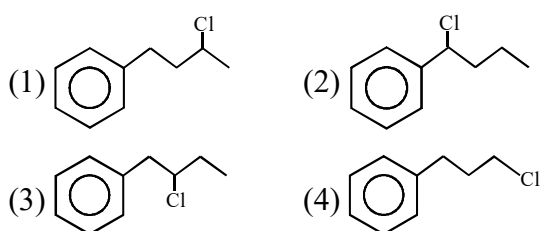
Q.37 Cr^{+3} in aqueous medium form green coloured complex with NH_3 ligand. How many ligand associated
(1) 3   (2) 4
(3) 5   (4) 6

Q.38 On complete hydrogenation, natural rubber produces
(1) ethylene-propylene copolymer
(2) vulcanised rubber
(3) polypropylene
(4) polybutylene

Q.39 At 60° and 1 atm, N_2O_4 is 50% dissociated into NO_2 then K_p is –
(1) 1.33 atm   (2) 2 atm
(3) 2.67 atm   (4) 3 atm

Q.40 Identify the non-narcotic analgesic from the following
(1) diazepam   (2) ibuprofen
(3) formalin   (4) terpineol

Q.41 Substances that are oxidised and reduced in the following reaction are respectively
$$N_2H_4\,(\ell) + 2H_2O_2\,(\ell) \rightarrow N_2(g) + 4H_2O\,(\ell)$$
(1) N_2H_4, H_2O (2) N_2H_4, H_2O_2
(3) N_2, H_2O_2 (4) H_2O, N_2
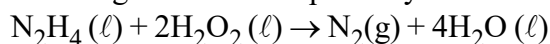
Q.42 Which halogen forms only one oxoacid (HOX)?
(1) F   (2) Cl
(3) Br   (4) I

Q.43 In which of the following pairs both the complexes show optical isomerism ?
(1) cis-$[Cr(C_2O_4)_2Cl_2]^{3-}$, cis-$[Co(NH_3)_4Cl_2]$
(2) $[Co(en)_3]Cl_3$, cis-$[Co(en)_2Cl_2]Cl$
(3) $[PtCl(dien)]Cl$, $[NiCl_2Br_2]^{2-}$
(4) $[Co(NO_3)_3(NH_3)_3]$, cis-$[Pt(en)_2Cl_2]$

Q.44 When calomel is treated with ammonium hydroxide, a black substance is formed. The black substance is –
(1) Hg + HgO   (2) HgO.HgCl$_2$
(3) H_2N– Hg–Cl + Hg   (4) $Hg(NH_2)_2$+ HgO

Q.45 The yellow colour in NaCl crystals is due to
(1) excitation of electrons in F-centres.
(2) reflection of light from Cl$^-$ ions on the surface.
(3) refraction of light from Na$^+$ ions.
(4) all of the above.

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PART B – PHYSICS

Q.46 Needles N_1, N_2 and N_3 are made of a ferromagnetic, a paramagnetic and a diamagnetic substance respectively. A magnet when brought close to them will :

(1) Attract N_1 strongly, N_2 weakly and repel N_3 weakly.

(2) Attract N_1 strongly, but repel N_2 and N_3 weakly.

(3) Attract all three of them.

(4) Attract N_1 and N_2.

Q.47 The ends of stretched wire of length L are fixed at $x = 0$ and $x = L$. In one experiment, the displacement of the wire is $y_1 = A\sin(\pi x / L)\sin\omega t$ and energy is E_1, and in another experiment its displacement is $y_2 = A\sin(2\pi x/L)\sin2\omega t$ and energy is E_2, Then :

(1) $E_2 = E_1$ (2) $E_2 = 2E_1$

(3) $E_2 = 4E_1$ (4) $E_2 = 16E_1$

Q.48 When a metallic surface is illuminated with radiation of wavelength λ, the stopping potential is V. If the same surface is illuminated with radiation of wavelength 2λ, the stopping potential is V/4. The threshold wavelength for the metallic surface is :

(1) 4λ (2) 5λ

(3) $(5/2)\lambda$ (4) 3λ

Q.49 The value of electric potential at any point due to any electric dipole is :

(1) $k \cdot \dfrac{\vec{p} \times \vec{r}}{r^2}$ (2) $k \cdot \dfrac{\vec{p} \times \vec{r}}{r^3}$

(3) $k \cdot \dfrac{\vec{p} \cdot \vec{r}}{r^2}$ (4) $k \cdot \dfrac{\vec{p} \cdot \vec{r}}{r^3}$

Q.50 In the circuit shown below $E_1 = 4.0$ V, $R_1 = 2\Omega$, $E_2 = 6.0$ V, $R_2 = 4\Omega$ and $R_3 = 2\Omega$. The current I_1 is
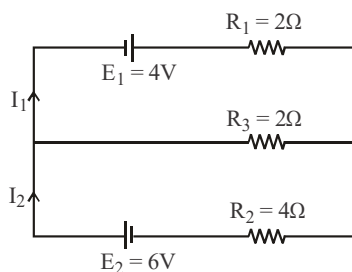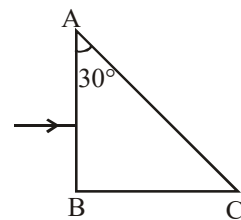

(1) 1.6 A   (2) 1.8 A

(3) 1.25 A   (4) 1.0 A

Q.51 A ray of light is incident on face AB of a right angled prism as shown in figure. The refractive index of prism is $\sqrt{2}$. What is the deviation suffered by ray?

(1) 15°   (2) 30°

(3) 45°   (4) 6°

Q.52 A body is falling from height 'h'. It takes t seconds to reach the ground. Calculate the time taken by it to cover the first h/16 height :

(1) $t\sqrt{2}$ (2) $t/2$

(3) $t/4$ (4) $t/8$

Q.53 A dynamometer D, is connected with to bodies of mass M = 6 kg and m = 4kg. If two forces F = 20N & F = 10 N are applied on masses according to figure then reading of the dynamometer will be-
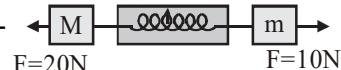
(1) 10 N   (2) 20 N

(3) 6 N   (4) 14 N

Q.54 If a thermometer reads freezing point of water as 20°C & boiling point as 150°C, how much thermo-'meter read when the actual temperature is 60°C

(1) 98°C   (2) 110°C

(3) 40°C   (4) 60°C

Q.55 A black body radiates energy at the rate of 1×10^5 J / s × m² at temperature of 227ºC. The temperature to which it must be heated so that it radiates energy at rate of 1×10^9 J/s m², is

(1) 5000 K   (2) 5000ºC

(3) 500 K   (4) 500ºC

Q.56 Two identical spheres each of mass M and radius R are separated by a distance 10R. The gravitational force on mass m placed at the midpoint of the line joining the centres of the spheres is :

(1) zero   (2) $\dfrac{2GMm}{25R^2}$

(3) $\dfrac{GMm}{25R^2}$ (4) $\dfrac{GMm}{100R^2}$

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Q.57 H^+, He^+ and O^{++} are projected in uniform transverse field with equal accelerating potential, then ratio of their radii are respectively if their masses are 1 a.m.u., 4 a.m.u. and 16 a.m.u. respectively :-

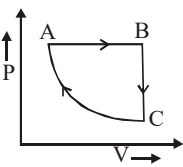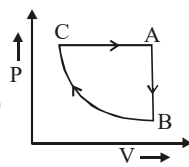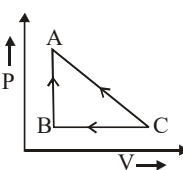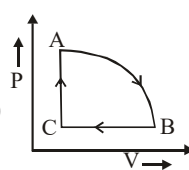(1) $1 : \sqrt{2} : 2\sqrt{2}$ (2) $1 : \sqrt{2} : \sqrt{2}$

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

Q.58 The distance covered by a body to come to rest when it is moving with a speed of 4 m/s is s, when a retarding force F is applied. If the KE is doubled, the distance covered by it to come to rest for the same retarding force F is :

(1) 4 s   (2) 6 s

(3) 2 s   (4) 8 s

Q.59 A cyclic process ABCA as show in V–T diagram. is performed with a constant mass of an ideal gas. Which of the following graphs represents the corresponding process on P – V diagram :
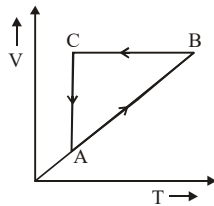
Q.60 A ring in horizontal plane begins to rotate about a vertical axis passing through its center, at t = 0 speeding up uniformly at the rate 1/1800 rad/s². The time t (in hours) at which the ring will rupture is [It is given that radius of ring is 2m and breaking tensile stress of ring's material is numerically 16 times the density of ring's material (In S.I. system)]

(1) 1 hr   (2) 2 hr

(3) 3 hr   (4) 4 hr

Q.61 A uniform rod AB of length ℓ and mass m is free to rotate about point A. The rod is released from rest in horizontal position. Given that the moment of inertia of the rod about A is $m\ell^2/3$ the initial angular acceleration of the rod will be :
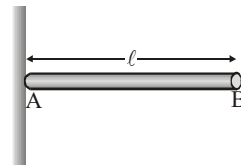
(1) $2g / 3\ell$ (2) $mg\ell / 2$

(3) $(3/2) g\ell$ (4) $3g / 2\ell$

Q.62 The frequency of oscillation of the springs shown in the figure will be :
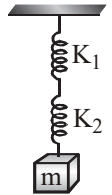
(1) $\dfrac{1}{2\pi} \sqrt{\dfrac{K}{m}}$ (2) $\dfrac{1}{2\pi} \sqrt{\dfrac{(K_1 + K_2)\,m}{K_1 K_2}}$

(3) $2\pi \sqrt{\dfrac{K}{m}}$ (4) $\dfrac{1}{2\pi} \sqrt{\dfrac{K_1 K_2}{m\,(K_1 + K_2)}}$

Q.63 Two long current carrying thin wires, both with current I, are held by insulating threads of length L and are in equilibrium as shown in the figure, with threads making an angle θ with the vertical. If wires have mass λ per unit length then the value of I is (g = gravitational acceleration) :
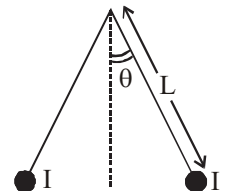
(1) $\sin\theta \sqrt{\dfrac{\pi\lambda gL}{\mu_0 \cos\theta}}$ (2) $2\sin\theta \sqrt{\dfrac{\pi\lambda gL}{\mu_0 \cos\theta}}$

(3) $2 \sqrt{\dfrac{\pi gL}{\mu_0} \tan\theta}$ (4) $\sqrt{\dfrac{\pi\lambda gL}{\mu_0} \tan\theta}$

Q.64 If a cyclist moving with a speed of 4.9 m/s on a level road can take a sharp circular turn of radius 4m, then minimum value of coefficient of friction between the cycle tyres and road is :
(1) 0.41   (2) 0.51
(3) 0.61   (4) 0.71

Q.65 The head lights of a jeep are 1.2 m apart. If the pupil of the eye of an observer has a diameter of 2mm and light of wavelength 5896 Å is used, what should be the maximum distance of the jeep from the observer if the two head lights are just separated
(1) 33.9 km   (2) 33.9 m
(3) 3.34 km   (4) 3.39 m

Q.66 A 2V battery is connected across the points A and B as shown in the figure given below. Assuming that the resistance of each diode is zero in forward bias and infinity in reverse bias, the current supplied by the battery when its positive terminal is connected to A is :
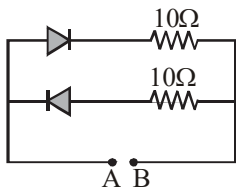
(1) 0.2 A   (2) 0.4 A
(3) zero   (4) 0.1 A

Q.67 Two trains, each moving with a velocity of 30m/s, cross each other. One of the trains gives a whistle whose frequency is 600Hz. If the speed of sound is 330 m/s, the apparent frequency for passengers sitting in the other train before crossing would be :
(1) 600 Hz   (2) 630 Hz
(3) 920 Hz   (4) 720 Hz

Q.68 A sphere of solid material of relative density 9 has a concentric spherical cavity and floats having just sinked in water. If the radius of the sphere be R, then the radius of the cavity (r) will be related to R as :

(1) $r^3 = \dfrac{8}{9}R^3$ (2) $r^3 = \dfrac{2}{3}R^3$

(3) $r^3 = \dfrac{\sqrt{8}}{3}R^3$ (4) $r^3 = \sqrt{\dfrac{2}{3}R^3}$

Q.69 The power factor of the circuit as shown in figure is :
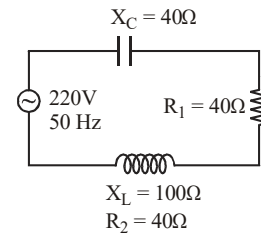
(1) 0.2   (2) 0.4
(3) 0.8   (4) 0.6

Q.70 Out of the following phenomenon :
(a) Interference   (b) Refraction
(c) Reflection   (d) Polarisation
(e) Diffraction
(f) Rectilinear propagation
The most powerful evidence in support of wave theory of light are :
(1) b, c, d and f only
(2) a, d and f only
(3) a, d and e only
(4) All a, b, c, d, e and f

Q.71 A radioactive sample of U^{238} decay to Pb through a process for which half life is 4.5×10^9 years. The ratio of number of nuclei of Pb to U^{238} after a time of 1.5×10^9 years (given $2^{1/3} = 1.26$) :
(1) 0.12   (2) 0.26
(3) 1.2   (4) 0.37

Q.72 A phonograph turn-table rotating at 78 rev/min slows down and stops in 30 sec after the motor is turned off. Then the revolutions made by it in this time are :
(1) 19.5   (2) 39
(3) 78   (4) 156

Q.73 In an n–p–n transistor 10^{10} electron enter the emitter in 10^{-6} s. If 2% of the electrons are lost in the base, the current amplification factor (β) is :
(1) 0.02   (2) 7
(3) 33   (4) 49

Q.74 A resonating air column shows resonance with tuning fork of frequency 256 Hz at column lengths 33.4 cm and 101.8 cm. The speed of sound is :
(1) 300 m s^{-1} (2) 250 m s^{-1}
(3) 390 m s^{-1} (4) 350 m s^{-1}

SPACE FOR ROUGH WORK

Q.75 In a simple microscope of focus length 5 cm final image is formed at D, then its magnification will be
(1) 6   (2) 5
(3) 2   (4) 1

Q.76 In a solar cell current is generated due to bond breakage in which region.
(1) depletion region   (2) n-region
(3) p-region   (4) None of these

Q.77 A 4 kg roller is attached to a massless spring of spring constant k = 100 N/m. It rolls without slipping along a frictionless horizontal road. The roller is displaced from its equilibrium position by 10 cm and then released. Its maximum speed will be
(1) 0.5 m/s   (2) 0.6 m/s
(3) 0.4 m/s   (4) 0.8 m/s

Q.78 Two waves represented by $y = a \sin(\omega t - kx)$ and $y = a \cos(\omega t - kx)$ are superposed. The resultant wave will have an amplitude –
(1) a (2) $\sqrt{2}\,a$
(3) $2a$ (4) zero

Q.79 An early model for an atom considered it to have a positively charged point nucleus of charge Ze, surrounded by a uniform density of negative charge upto a radius R. The atom as a whole is neutral. The electric field at a distance r from the nucleus is ($r < R$)
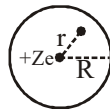
(1) $\dfrac{Ze}{4\pi\varepsilon_0}\left[\dfrac{1}{r^2} - \dfrac{r}{R^3}\right]$ (2) $\dfrac{Ze}{4\pi\varepsilon_0}\left[\dfrac{1}{r^3} - \dfrac{r}{R^2}\right]$

(3) $\dfrac{Ze}{4\pi\varepsilon_0}\left[\dfrac{r}{R^3} - \dfrac{1}{r^2}\right]$ (4) $\dfrac{Ze}{4\pi\varepsilon_0}\left[\dfrac{r}{R^3} + \dfrac{1}{r^2}\right]$

Q.80 A parallel plate capacitor with air as a dielectric has capacitance C. A slab of dielectric constant K, having same thickness as the separation between the plates is introduced so as to fill one-fourth of the capacitor as shown in the figure. The new capacitance will be –
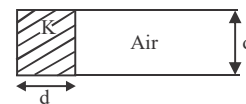
(1) $(K + 3)\dfrac{C}{4}$ (2) $(K + 2)\dfrac{C}{4}$

(3) $(K + 1)\dfrac{C}{4}$ (4) $\dfrac{KC}{4}$

Q.81 Two balls are thrown from the top of a building, as in the drawing. Ball 1 is thrown straight down, and ball 2 is thrown with the same speed, but upward at an angle θ with respect to the horizontal.
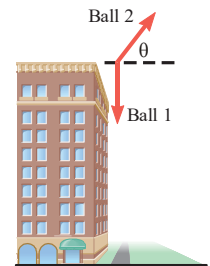
Consider the motion of the balls after they are released. Which one of the following statements is true?
(1) The acceleration of ball 1 becomes larger and larger as it falls, because the ball is going faster and faster.
(2) The acceleration of ball 2 decreases as it rises, becomes zero at the top of the trajectory, and then increases as the ball begins to fall toward the ground.
(3) Both balls have the same acceleration at all times.
(4) Ball 2 has an acceleration in both the horizontal and vertical directions, but ball 1 has an acceleration only in the vertical direction.

Q.82 The conservation of linear momentum is applicable only when the system of objects is an isolated system. Which of the systems listed below are isolated systems?
1. A ball is dropped from the top of a building. The system is the ball.
2. A ball is dropped from the top of a building. The system is the ball and the earth.
3. A billiard ball collides with a stationary billiard ball on a frictionless pool table. The system is the moving ball.

SPACE FOR ROUGH WORK

4. A car slides to a halt in an emergency. The system is the car.

5. A space probe is moving in deep space where gravitational and other forces are negligible. The system is the space probe.

(1) Only 2 and 5 are isolated systems.

(2) Only 1 and 3 are isolated systems.

(3) Only 3 and 5 are isolated systems.

(4) Only 4 and 5 are isolated systems.

**Q.83** Object 1 is moving along the x axis with an initial momentum of +16 kg m/s where the + sign indicates that it is moving to the right. As the drawing shows, object 1 collides with a second object that is initially at rest. The collision is not head-on, so the objects move off in different directions after the collision. The net external force acting on the two-object system is zero. After the collision, object 1 has a momentum whose y component is –5 kg m/s. What is the y component of the momentum of object 2 after the collision?
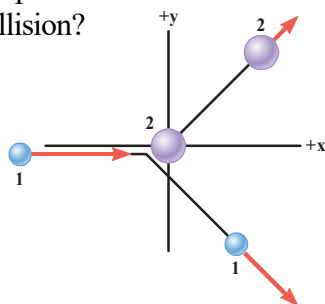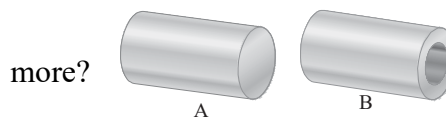

(1) 0 kg m/s   (2) +16 kg m/s

(3) +5 kg m/s   (4) –16 kg m/s

Q.84 An ice skater is spinning on frictionless ice with her arms extended outward. She then pulls her arms in toward her body, reducing her moment of inertia. Her angular momentum is conserved, so as she reduces her moment of inertia, her angular velocity increases and she spins faster. Compared to her initial rotational kinetic energy, her final rotational kinetic energy is

(1) the same

(2) larger, because her angular speed is larger

(3) smaller, because her moment of inertia is smaller.

(4) insufficient information

Q.85 Drawings A and B show two cylinders that are identical in all respects, except that one is hollow. Identical forces are applied to each cylinder in order to stretch them. Which cylinder, if either, stretches more?

(1) A and B both stretch by the same amount.

(2) A stretches more than B.

(3) B stretches more than A.

(4) Insufficient information is given for an answer.

Q.86 Figure is a graph of the magnetic flux through a certain coil of wire as a function of time during an interval while the radius of the coil is increased, the coil is rotated through 1.5 revolutions, and the external source of the magnetic field is turned off, in that order. Rank the emf induced in the coil at the instants marked A through E from the largest positive value to the largest-magnitude negative value. In your ranking, note any cases of equality and also any instants when the emf is zero.
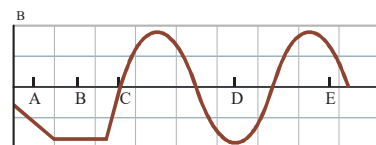
(1) E > A > B = D = 0 > C.

(2) A > E > B = D = 0 > C.

(3) E > A > B = C = 0 > D.

(4) E > C > B = D = 0 > A.

Q.87 Rank the following from largest to smallest, noting any cases of equality.

(a) the average speed of molecules in a particular sample of ideal gas.

(b) the most probable speed.

(c) the root-mean-square speed.

(d) the average vector velocity of the molecules.

(1) (a) > (c) > (b) > (d)

(2) (a) > (b) > (c) > (d)

(3) (c) > (a) > (d) > (b)

(4) (c) > (a) > (b) > (d)

Q.88 Rank the electric potential energies of the systems of charges shown in Figure from largest to smallest. Indicate equalities if appropriate.
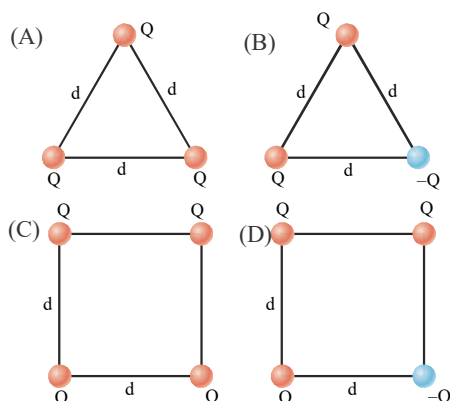
(1) A > B > C > D   (2) B > A > D > C
(3) C > A > D > B   (4) C > D > A > B

Q.89 If the wavelength of I^{st} line of Balmer series of hydrogen is 6561 Å, the wavelength of the 2nd line of series will be
(1) 9780 Å   (2) 4860 Å
(3) 8857 Å   (4) 4429 Å

Q.90 When a slow neutron is captured by a $^{235}_{92}U$ nucleus, a fission energy releasing 200 MeV. If power of nuclear reactor is 100 W then rate of nuclear fission is
(1) $3.6 \times 10^6 \, s^{-1}$ (2) $3.1 \times 10^{12} \, s^{-1}$
(3) $1.8 \times 10^4 \, s^{-1}$ (4) $4.1 \times 10^6 \, s^{-1}$

PART C – BIOLOGY

Q.91 Which one is incorrect statement related with digestive system ?
(1) Opening of hepatopancreatic duct in duodenum is guarded by sphinctor of oddi.
(2) Liver is largest gland of the body weighing about 1.2 to 1.5 kg. in an adult person.
(3) Intestine (ileum) is lined with brush border glandular columnar epithelium.
(4) Unit of liver is called as Glisson's capsule which is not surrounded by connective tissue.

Q.92 If the sequence of the coding strand in a transcription unit is written as follows :

5' ATGCCGATTGCATGTAAT 3'
Write down the sequence of m-RNA :
(1) AUGCCGAUUGCAUGUAAU 3'
(2) AUGGGCUAACGTAGAUUA 3'
(3) UACGGCUAACGUACAUUA 3'
(4) TACGGCTAACGTACATTA 3'

Q.93
(a) Bulb   (i) *Euphorbia*
(b) Leaf Spine   (ii) Onion
(c) Stem tendril   (iii) Cactus
(d) Phylloclade   (iv) Gourds
                 (v) Grapes
Choose the correct match.
(1) a-v, b-iii, c-ii, d-i   (2) a-ii, b-iii, c-v, d-i
(3) a-iv, b-i, c-v, d-iii   (4) a-ii, b-i, c-iv, d-iii

Q.94 Which step is important for continuity of glycolysis in anerobic respiration ?
(1) oxidation of PGAL
(2) substrate level phosphorylation
(3) oxidation of NADH . H^+
(4) formation of pyruvic acid

Q.95 The plant hormone responsible for fruit ripening is
(1) abscissic acid.   (2) auxin.
(3) cytokinin.   (4) ethylene.

Q.96 Find out the Incorrect Match :
(1) Biosphere Reserve – 14
(2) Wild life Sanctuaries – 448
(3) Indian Hot spot – 6
(4) National Parks – 90

Q.97 Which of the following statement is not true for the below given diagram ?
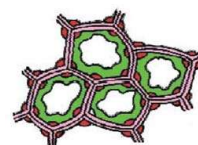
(1) It provide the mechanical support to the growing part of plant such as young stem and petiole of leaves.
(2) It is present below the epidermis in the form of homogenous layer or a patches in dicot stem.
(3) It is present in form of semilunar patches in the pericycle of dicot stem.
(4) They can assimilate food.

Q.98 Which one of the following is used in the production of yoghurt ?
(1) *Streptococcus thermophilus*
(2) *Acetobacter aceti*
(3) *Lactobacillus bulgaricus*
(4) Both (1) and (3)

Q.99 "Similar habitat that has resulted in selection of similar adaptive features in different groups of organisms but toward the same function," is valid for :
(1) Homologous organs (2) Analogous organs
(3) Vestigeal organs (4) Atavism

Q.100 Foetal ejection reflex is caused by :
(1) Fully developed foetus
(2) Fully developed placenta
(3) Fully developed foetus and placenta
(4) High level of progesterone

Q.101 In mammalian ear, a membranous structure which separate the scala media and scala tympani is :
(1) Basilar membrane (2) Reissner's membrane
(3) Autolith membrane (4) Tectorial membrane

Q.102 If 9 percent of all cicadas exhibit the homozygous recessive condition known as "flippant wings," what is the gene frequency for that gene in the general population?
(1) cannot be determined
(2) 91 percent
(3) 0.9
(4) 0.3

Q.103 Which of the following statement is incorrect ?
(1) Oxygen dissociation curve is obtained when % saturation of haemoglobin with O_2 is plotted against the pO_2.
(2) When pH decreases, oxygen dissociation curve shifts to right.
(3) In tissues where there is low pO_2, high pCO_2, lesser H^+ concentration and high temperature support dissociation of oxyhaemoglobin.
(4) 100 ml of oxygenated blood can deliver around 5 ml of O_2 to the tissues under normal physiological conditions.

Q.104 "Erythropoeitin" is secreted by :
(1) Liver (2) Kidney
(3) Thymus (4) Adrenal gland

Q.105 Injury to vagus nerve in human is not likely to affect
(1) tongue movements
(2) gastrointestinal movements
(3) pancreatic secretion
(4) cardiac movements

Q.106 Which of the following is smallest angiospermic parasite ?
(1) *Wolfia* (2) Arceuthobium
(3) Hydrilla (4) Azolla

Q.107 *Chlorella, Chlamydomonas, Paramoecium* and *Amoeba* were earlier placed with plants and animals respectively but after Whittaker's 5 kingdom classification, they should be brought together in :
(1) Monera (2) Protista
(3) Plantae (4) Animalia

Q.108 Which statement is correct about the members of Annelida ?
(1) They are the triploblastic animals
(2) They have an incomplete digestive system
(3) Closed circulatory system is found in them
(4) Metameric segmentation is an important character of annelids

Q.109 Select correct option regarding cell membrane :-
(1) Plasma membrane of human RBC's has 58% lipid, 40% protein.
(2) Main lipid is phospholipid.
(3) Membrane is composed of only lipid and protein.
(4) Carbohydrate present on both outer and inner side of membrane.

Q.110 How many photons are required to fix $1CO_2$ during photosynthesis process ?
(1) 4 (2) 6
(3) 8 (4) 12

Q.111
(a) During ventricular systole Bicuspid and tricuspid valves are open.
(b) Stroke volume is the amount of blood pumped by each ventricle per minute.
(c) Body has ability to change stroke volume and cardiac output.
(d) Time duration between Lubb and Dup sound is same as of ventricular systole.
How many above mentioned statements is/are correct ?
(1) One (2) Two
(3) Three (4) Four

Q.112 Most of the micro-organisms which produce antibiotics live in the soil because
(1) Darkness favours synthesis of antibiotics.
(2) By the phenomenon of antibiosis, their growth, nutrition and survival value are enhanced in competitive world of microflora of the soil.
(3) They cannot get nutrition outside the soil.
(4) No one easily misuse their antibiotics.

Q.113 Match the column-I and column-II

Column-I	Column-II
(i) DNA - replication	(a) hnRNA (heterogenous nuclear RNA)
(ii) Monocistronic	(b) Reminiscent of antiquity
(iii) Presence of introns	(c) Eukaryotes
(iv) RNA polymerase-II	(d) Semiconservative

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

Q.114 a - Diaphragm, b - EICM,
c - IICM d - Abdominal muscles
We have the ability to increase the strength of expiration by the contraction of which set of muscles?
(1) a, b, c and d (2) b, c and d
(3) c and d (4) a and d

Q.115 Which hormone is known as first aid hormone ?
(1) Vit-D (2) Kinins
(3) Thymosin (4) Prostaglandins

Q.116 In *Pinus,* endosperm cell has 15 chromosomes then how many chromosomes are present in the egg cell
(1) 15 (2) 30
(3) 45 (4) 10

Q.117 Mesothelium is
(1) Lining of coelom which orginated from ectoderm.
(2) Lining of coelom which originatd from mesoderm.
(3) Lining of heart which originated from ectoderm.
(4) Lining of heart which originated from endoderm.

Q.118 "Embryos of advanced species pass through stages represented by adult organism of more primitive species" the given statement is related with:
(1) Baer's law (2) Biogenetic law
(3) Recapitulation theory (4) Dollo's law

Q.119 Which of the following plant forms bulbil during their life cycle ?
(1) *Agave* (2) *Smilax*
(3) *Petunia* (4) Banana

Q.120 Which one is not possible in inbreeding ?
(1) Exposure of harmful recessive genes and their elimination by selection.
(2) Increase in homozygocity.
(3) Inbreeding depression
(4) Accumulation and elimination of superior genes

Q.121 Western blotting is used for the identification of :-
(1) DNA (2) RNA
(3) Protein (4) All of the above

Q.122 Which of the following can be the examples of symbiosis :
(1) Lichen (2) Ectomycorrhiza
(3) Endomycorrhiza (4) All of the above

Q.123 Control of prickly pear cactus by moth reflects the property of predator that it :
(1) Acts as medium for energy transfer.
(2) Keeps prey population under control.
(3) Maintain species diversity.
(4) Predators are prudent in nature.

Q.124 Which one of them is not an example of mollusca ?
(1) Pinctoda (2) Dentalium
(3) Limulus (4) Aplysia

SPACE FOR ROUGH WORK

Q.125 Select the correct match :

i. Phosphorus	a. Nitrogenase
ii. Magnesium	b. Water splitting
iii. Sulphur	c. Nucleic acids
iv. Chlorine	d. Thiamine
	e. Ribosome structure

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

Q.126 OPV and BCG vaccines are ___ vaccines :
(1) Live attenuated   (2) Killed vaccines
(3) Recombinant   (4) Antiserum

Q.127 The movement chloride ion into R.B.C. from the plasma to maintain the osmotic balance during the transport of gases is known as :
(1) Hamburger effect   (2) Haldane effect
(3) Carbon dioxide transport   (4) Oxidation

Q.128 Lizard remove their tail in danger, this process is called :
(1) Refrectomy   (2) Autotomy
(3) Moulting   (4) Casting

Q.129 What is true about sex determination in chickens ?
(1) ZZ males and ZW females
(2) ZW males and ZZ females
(3) XO males and XX females
(4) XX males and XO females

Q.130 Which of the following statement is incorrect ?
(1) In some pteridophytes [Selaginella, Salvinia] sporophylls may form distinct compact structures called strobili or cones.
(2) The pteridophytes includes horsetails and ferns.
(3) In pteridophytes, the main plant body is a sporophyte.
(4) All of these

Q.131 Events of mitosis is given in column-I and stages are given in column-II. Match the column-I and column-II and select the correct option given below:

Column-I (Events)	Column-II (Stage of mitosis)
A. Chromatids move to opposite poles	i Prophase
B. Spindle fibres attach to kinetochores of chromosomes	ii. Anaphase
C. Chromosome lost their identify	iii. Metaphase
D. Initiation of the assembly of mitotic spindle.	iv Telophase

(1) A-ii, B-iii, C-i, D-iv   (2) A-i, B-iii, C-ii, D-iv
(3) A-ii, B-iii, C-iv, D-i   (4) A-iii, B-ii, C-iv, D-i

Q.132 Match the correct one :

a. Chrysophytes	i. Saprophytes
b. Dinoflagellates	ii. Diatomaceous earth
c. Euglenoids	iii. Red tides
d. Slime moulds	iv. Pellicle

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

Q.133 More accurate measure of biomass will be in terms of –
(1) Dry weight   (2) Fresh weight
(3) Both 1 and 2   (4) detritus

Q.134 In which group gametophyte is depend on sporophyte :
(1) Algae   (2) Bryophyta
(3) Moss   (4) Gymnosperm

Q.135 Match the following.

(a) Axillary bud	(i) Occurs in layers below the epidermis in dicotyledonous plants
(b) Intercalary meristem	(ii) The meristems which occur at the tips of roots and shoots and produce primary tissues.
(c) Apical meristem	(iii) They occur in grasses and regenerate parts removed by the grazing herbivores.
(d) Collen chyma	(iv) Some cells left behind from shoot apical meristem

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

Q.136 Which of following hormone play an important role in seed maturation ?
(1) ABA   (2) Ethylene
(3) Cytokinin   (4) Auxin

SPACE FOR ROUGH WORK

Q.137 Match the column-I to column-II :

Column-I	Column-II
(a) Inter calated disc	(i) Skeletal muscle
(b) Actinin	(ii) Regulatory protein
(c) Troponin	(iii) Cardiac
(d) Syncitial	(iv) Z-line

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

Q.138 If pressure greater than atmospheric pressure is applied to a solution or pure water, its water potential :
(1) Decreases greatly
(2) Increases
(3) Decreases slowly
(4) No effect

Q.139 According to Hugo devries mutation are :
(1) large difference arising suddenly in a population
(2) Random and directionless
(3) Small and directional
(4) 1 and 2 both

Q.140 How many plants in the list given below are insect pollinated plants :
Coriander, Sun-flower, Coconut, Water lily, Water hyacinth, *Vallisneria, Ophrys*, Papaya, Cotton, Lobia, Banana, *Adansonia, Bombax,* Bamboo, Wheat, Rice.
(1) Seven
(2) Ten
(3) Eleven
(4) Five

Q.141 Choose the incorrect match :
(1) Paddy fields – *Oscillatoria*
(2) Methanogens – *Rumenococcus*
(3) Halophiles – Thermoacidophiles
(4) Bunchy top of papaya – PPLO

Q.142 Bonding between atoms within an enzyme such as trypsin is best described as
(1) peptide
(2) saccharide
(3) ionic
(4) van der Waals

Q.143 Which of the following is not causative agent of ring worm ?
(1) *Trichophyton*
(2) *Claviceps*
(3) *Microsporum*
(4) (1) & (3) both

Q.144 Which of the following algae used to prepare culture medium to grow microbe ?
(1) *Gelidium*
(2) *Ectocarpus*
(3) *Polysiphonia*
(4) *Fucus*

Q.145 In Dicot stem, bundle cap is present, it is present in which layer ?
(1) Endodermis
(2) Pericycle
(3) Casparian strip
(4) Periderm

Q.146 Which of the following is not associated with HGP?
(1) Bioinformatics
(2) BAC and YAC
(3) Automated DNA sequence
(4) VNTR

Q.147 Which one of the following option is not correctly matched ?
(1) Dryopithecus → Common ancestor of ape & man
(2) Industrial melanism → Example of Darwinism
(3) Adaptive radiation → Marsupial mammals
(4) Analogous organ → Thorn of bogainvilia and tendrils of cucurbita

Q.148 Which of the following is a feature of typical K-selected species ?
(1) Short life span
(2) Large number of offsprings in a single mating
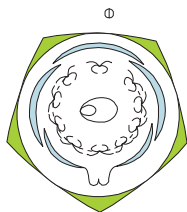(3) Small sized offsprings
(4) Long life span

Q.149 Which of the following is an example of interspecific hybridisation ?
(1) Hissardale
(2) Jersey
(3) Merino
(4) Mule

Q.150 Which of the following is the correct floral formula for the floral diagram given below?

(1) $Br \oplus \male\female$ Epi $K_{5 \text{ or } (5)} \overbrace{C_5 \quad A}_{(\infty)} \underline{G}_{(2-\infty)}$

(2) $\oplus \male\female K_{(5)} \overbrace{C_5 \quad A}_{(5)} \underline{G}_{(2)}$

(3) $\% \male\female K_{(5)} C_{1+2+(2)} A_{(9)+1} \underline{G}_1$

(4) $\oplus \male\female \overbrace{P_{3+3 \text{ or } (3+3)} A}_{3+3} \underline{G}_{(3)}$

Q.151 Match column - I with column - II and choose the correct option from below.

Column -I	Column - II
a. Marginal placentation	(i) Sunflower
b. Axile placentation	(ii) Mustard
c. Parietal placentation	(iii) Lemon
d. Basal placentation	(iv) Pea

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

Q.152 Select the correct pair amongst the following.
(1) Spring wood - light colour, high density
(2) Spring wood - dark colour, low density
(3) Autumn wood - light colour, high density
(4) Autumn wood - dark colour, high density

**Q.153** As secondary growth proceeds, in a dicot stem, the thickness of –
(1) sapwood increases.
(2) heartwood increases.
(3) both sapwood and heartwood increases.
(4) both sapwood & heartwood remains the same.

Q.154 Refer to the following diagram.
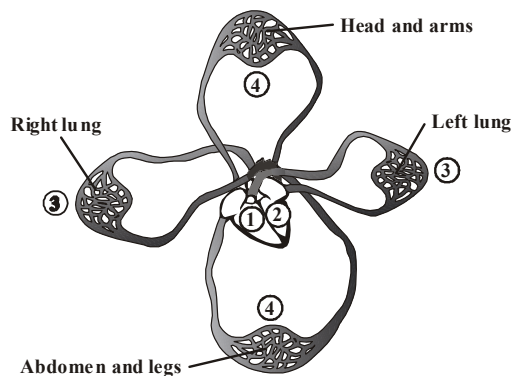
The path of blood through the circulatory system is
(1) 1 to 2 to 3 to 4 to 1
(2) 1 to 3 to 2 to 4 to 1
(3) 1 to 4 to 2 to 3 to 1
(4) 2 to 3 to 4 to 1 to 2

Q.155 A geneticist traced a rare disorder through three generations of a family. The geneticist's findings are shown in the pedigree below.
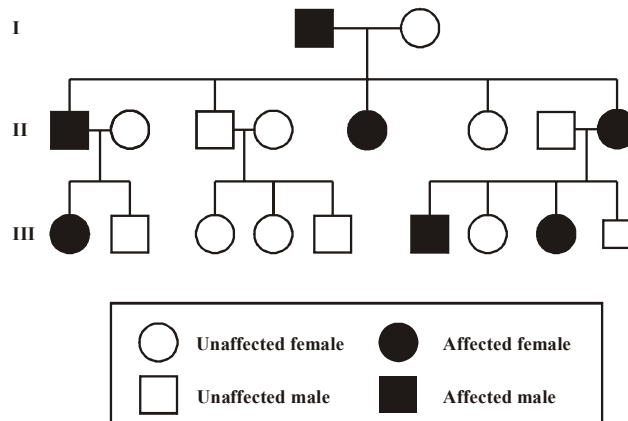
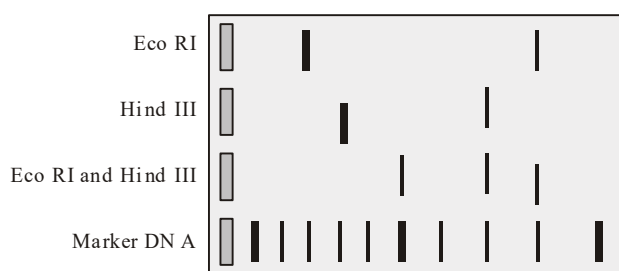How many affected females in generation II passed the disorder to their offspring?
(1) 0
(2) 1
(3) 2
(4) 3

Q.156 Scientists cut a linear piece of DNA with restriction enzymes. They then amplified the DNA and performed gel electrophoresis. The resulting agarose gel is shown.

Enzyme	Site
EcoR I	5'-GAATTC-3'
BamH I	5'-GGATCC-3'
Hind III	5'-AAGCTT-3'

When both enzymes were added to the DNA, in how many places was the DNA cut?
(1) 0 (2) 1
(3) 2 (4) 3

Q.157 Which of these can be used to increase the amount of DNA available for analysis?
I. Cloning a plasmid II. Gel electrophoresis
II. PCR
(1) II only (2) I and II
(3) I and III (4) II and III

Q.158 Which of these correctly matches the plant cells to their tissue systems?
I. Guard cell
II. Palisade mesophyll cell
III. Sieve-tube member
(1) I = dermal; II = ground; III = vascular
(2) I = dermal; II = vascular; III = ground
(3) I = ground; II = dermal; III = vascular
(4) I = ground; II = vascular; III = dermal

Q.159 Which of these is the MOST LIKELY result of blood calcium levels falling too low?
(1) The thyroid gland releases calcitonin, which binds to bone cells.
(2) The parathyroid glands release PTH, which binds to kidney cells.
(3) The thyroid gland releases thyroid hormone, which binds to small intestine cells.
(4) The pancreas releases glucagon, which binds to liver cells.

Q.160 The diagram shows the muscles involved in extending the arm. Which actions result in this movement?
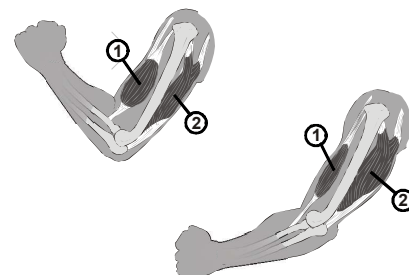
(1) Muscle 1 relaxes while muscle 2 contracts.
(2) Muscle 1 contracts while muscle 2 relaxes.
(3) Muscle 1 contracts, and then both muscles relax.
(4) Muscle 1 and muscle 2 both relax the same time.

Q.161 Which of the following is correctly labelled for the given figure?

Z-scheme of light reaction
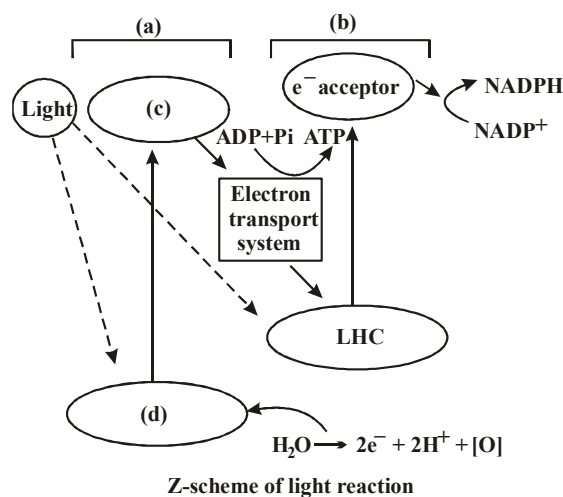
(1) a : PS II; b : PS I; c : e⁻ acceptor; d: LHC
(2) a : LHC; B : e⁻ acceptor; c : PS I; D : PS II
(3) a : PS I; b : PS II; c : e⁻ acceptor; d : LHC
(4) a : e⁻ acceptor; b : LHC; c : PS II; d : PS I

Q.162 Kranz anatomy is usually associated with
(1) C_3 plants   (2) C_4 plants
(3) CAM plants   (4) C_3-C_4 intermediate plants.

Q.163 Photosynthesis in C_4 plants is relatively less limited by atmospheric CO_2 levels because –
(1) there is effective pumping of CO_2 into bundle sheath cells.
(2) RuBisCO in C_4 plants has higher affinity for CO_2.
(3) six carbon acids are the primary initial CO_2 fixation products.
(4) the primary fixation of CO_2 is mediated via PEP carboxylase.

Q.164 A plasmolysed cell can be deplasmolysed by placing it in
(1) isotonic solution
(2) saturated solution
(3) pure water or hypotonic solution
(4) hypertonic solution.

Q.165 Identify the **incorrect** statement about ABA growth regulator.
(1) It increases the tolerance of plants against different stresses.
(2) It acts as general plant growth inhibitor and inhibitor of metabolism.
(3) It helps in seed maturation and dormancy.
(4) It promotes morphogenesis and differentiation of shoots.

Q.166 Respiratory pigment in blood of cockroach is:
(1) Haemoglobin   (2) Haemocyanine
(3) Haemomerithrin   (4) Absent

Q.167 Maximum available biomass for consumption to herbivores, called as :
(1) GPP   (2) NPP
(3) NCP   (4) Secondary productivity

Q.168 Which of the following gastric secretions is correctly matched with its source?
(1) Pepsinogen – Chief cells
(2) Chymotrypsin – Parietal cells
(3) HCl – Goblet cells
(4) Mucus – Oxyntic cells

Q.169 What is the oxidation state of iron in haemoglobin?
(1) Fe^- (2) Fe^{2+}
(3) Fe^{3+} (4) Fe^{4+}

Q.170 Which of the following is true for excretion in humans?
(1) Glucose and amino acids are reabsorbed in PCT by simple diffusion.
(2) DCT is impermeable to water.
(3) On an average, 25-30 gm of urea is excreted out per day.
(4) Maximum reabsorption occurs in the loop of Henle.

Q.171 Some studies suggest that in patients with Alzheimer's disease, there is a defect in the way the spindle apparatus attaches to the kinetochore fibers. At which stage of mitotic division would you expect to see this problem?
(1) Prophase   (2) Metaphase
(3) Anaphase   (4) Telophase

Q.172 Match the source gland with its respective hormone and function and select the correct option.

	Source gland	Hormone	Function
(1)	Anterior pituitary	Oxytocin	Contraction of uterine muscles
(2)	Anterior pituitary	Vasopressin	Induces reabsorption of water in nephron
(3)	Thymus	Thymosin	Proliferation of T-lymphocytes
(4)	α-cells of islets of Langerhans	Glucagon	Uptake of glucose into the cell.

SPACE FOR ROUGH WORK

Q.173 Identify the parts labelled a, b, c and d in the given figure and select the correct option.
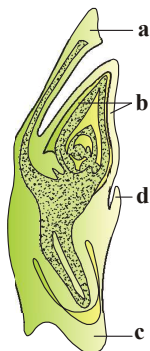
(1) a-Scutellum, b-Epiblast, c-Coleoptile, d-Coleorhiza.

(2) a-Scutellum, b-Coleorhiza, c-Coleoptile, d-Epiblast.

(3) a-Scutellum, b-Coleoptile, c-Coleorhiza, d-Epiblast.

(4) a-Epiblast, b-Coleoptile, c-Coleorhiza, d-Scutellum.

Q.174 Starting from the maximum, arrange the following male reproductive accessory organs in the correct order, based on the amount of secretion poured into urethra.

(i) Prostate gland   (ii) Seminal vesicle

(iii) Bulbourethral gland

(1) (i) > (ii) > (iii)   (2) (iii) > (ii) > (i)

(3) (ii) > (iii) > (i)   (4) (ii) > (i) > (iii)

Q.175 In a 3.2 Kbp long piece of DNA, 820 adenine bases were found. What would be the number of cytosine bases?

(1) 780   (2) 1560

(3) 740   (4) 1480

Q.176 Which one of the following is reptilian ancestor of birds?

(1) *Hesperornis*   (2) *Ichthvornis*

(3) *Archaeoptervx*   (4) *Lvcaenops*

Q.177 Choose the correctly matched pair from the following.

(1) Gonorrhoea, hepatitis B - sexually transmitted diseases

(2) AIDS, gonorrhoea - viral infection

(3) Diphtheria, ringworm - fungal infection

(4) Diphtheria, tuberculosis - protozoan infection

Q.178 Which of the following is a cloning vector?

(1) DNA of *Salmonella typhimurium*

(2) Ti plasmid

(3) Amp^r and Tet^r loci

(4) *ori* minus pBR322

Q.179 A large quantity of urban sewage is drained to nearby village river. Which among the given conditions would happen after mixing of sewage into the river?

(i) Biochemical oxygen demand (BOD) of receiving water body increases.

(ii) Dissolved oxygen of receiving water body decreases.

(iii) It will not cause mortality among fishes and other aquatic creatures.

(iv) It will lead to nutrient enrichment of receiving water body.

(1) (i), (ii) and (iii)   (2) (i), (ii) and (iv)

(3) (ii) and (iii)   (4) (iii) and (iv)

Q.180 The process where a population inhibits the growth of other population without affecting itself is known as

(1) amensalism   (2) parasitism

(3) mutualism   (4) commensalism