CBSE EXAMINATION PAPER-2009

NEET-ZOOLOGY

(Solved)

Time allowed : 3 hours | Maximum Marks : 800

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **200 questions.** All questions are **compulsory.**

ii. This question paper is divided into **1 sections.**

iii. **Section A** – questions number **1 to 200** are multiple choice questions

iv. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

v. Use of calculator is NOT allowed.

Section A

Question 1.

A bus is moving with a speed of 10 ms^{-1} on a straight road. A scooterist wishes to overtake the bus in 100 s. If the bus is at a distance of 1 km from the scooterist, with what speed should the scooterist chase the bus?

[4 Marks]

(A) 25 ms^{-1}

(B) 20 ms^{-1}

(C) 40 ms^{-1}

(D) 10 ms^{-1}

Question 2.

A body under the action of a force F vector = 6 î − 8 ĵ + 10 k̂, acquires an acceleration of 1 m/s². The mass of this body must be

[4 Marks]

(A) 10√2 kg

(B) 2√10 kg

(C) 20 kg

(D) 10 kg

Question 3.

The mass of a lift is 2000 kg. When the tension in the supporting cable is 28000 N, then its acceleration is:

[4 Marks]

(A) 30 ms^{-2} downwards

(B) 4 ms^{-2} downwards

(C) 4 ms^{-2} upwards

(D) 14 ms^{-2} upwards

Question 4.

An engine pumps water continuously through a hose. Water leaves the hose with a velocity v and m is the mass per unit length of the water jet. What is the rate at which kinetic energy is imparted to water?

[4 Marks]

(A) $\frac{1}{2}mv^3$

(B) $\frac{1}{2}mv^2$

(C) mv^2

(D) $\frac{1}{2}m^2v^2$

Question 5.

A body of mass 1 kg is thrown upwards with a velocity 20 m/s. It momentarily comes to rest after attaining a height of 18 m. How much energy is lost due to air friction?

($g = 10\ m/s^2$)

[4 Marks]

(A) 40 J

(B) 20 J

(C) 30 J

(D) 10 J

Question 6.

An explosion blows a rock into three parts. Two parts go off at right angles to each other. These two are, 1 kg first part moving with a velocity of 12 ms^{-1} and 2 kg second part moving with a velocity of 8 ms^{-1} . If the third part flies off with a velocity of 4 ms^{-1}, its mass would be:

[4 Marks]

(A) 17kg

(B) 5kg

(C) 7kg

(D) 3kg

Question 7.

Two bodies of mass 1 kg and 3 kg have position vectors $\hat{i} + 2\hat{j} + \hat{k}$ and $-3\hat{i} - 2\hat{j} + \hat{k}$ respectively. The centre of mass of this system has a position vector:

[4 Marks]

(A) $-2\hat{i} - \hat{j} + \hat{k}$

(B) $2\hat{i} - \hat{j} - 2\hat{k}$

(C) $-\hat{i} + \hat{j} + \hat{k}$

(D) $-2\hat{i} + 2\hat{k}$

Question 8.

A thin circular ring of mass M and radius R is rotating in a horizontal plane about an axis vertical to its plane with a constant angular velocity ω. If two objects each of mass m be attached gently to the opposite ends of a diameter of the ring, the ring will then rotate with an angular velocity:

[4 Marks]

(A) ωM/(M + m)

(B) ω(M − 2m)/(M + 2m)

(C) ωM/(M + 2m)

(D) ω(M + 2m)/M

Question 9.

If □□ is the force acting on a particle having position vector □□ and τ vector be the torque of this force about the origin, then:

[4 Marks]

(A) □□ · τ vector = 0 and □□ · τ vector ≠ 0

(B) □□r · τ vector = 0 and □□ · τ vector = 0

(C) □□ · τ vector > 0 and □□ · τ vector < 0

(D) □□ · τ vector ≠ 0 and □□ · τ vector = 0

Question 10.

Four identical thin rods each of mass M and length l, form a square frame. Moment of inertia of this frame about an axis through the centre of the square and perpendicular to its plane is:

[4 Marks]

(A) (2/3) Ml^2

(B) (13/3) Ml^2

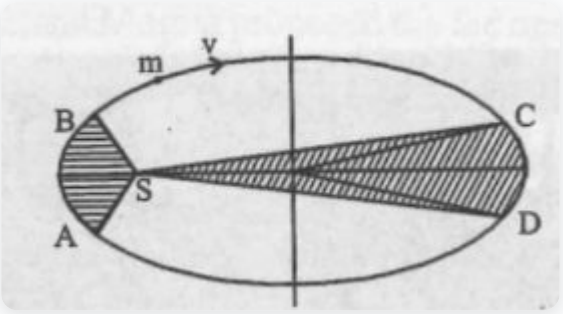
(C) (4/3) Ml^2

(D) (1/3) Ml^2

Question 11.

The figure shows elliptical orbit of a planet m about the sun S. The shaded area SCD is twice the shaded area SAB. If t_1 is the time for the planet to move from C to D and t_2 is the time to move from A to B then:

[4 Marks]



(A) $t_1 = 2t_2$

(B) $t_1 = 4t_2$

(C) $t_1 > t_2$

(D) $t_1 = t_2$

Question 12.

The two ends of a rod of length L and a uniform cross-sectional area A are kept at two temperatures T_1 and T_2 ($T_1 > T_2$). The rate of heat transfer, dQ/dt through the rod in a steady state is given by:

[4 Marks]

(A) $dQ/dt = k(T_1 - T_2)/LA$

(B) $dQ/dt = kLA(T_1 - T_2)$

(C) $dQ/dt = kA(T_1 - T_2)/L$

(D) $dQ/dt = kL(T_1 - T_2)/A$

Question 13.

A black body at 227°C radiates heat at the rate of 7 cals/cm²s. At a temperature of 727°C, the rate of heat radiated in the same units will be:

[4 Marks]

(A) 80

(B) 60

(C) 50

(D) 112

Question 14.

The internal energy change in a system that has absorbed 2 kcals of heat and done 500 J of work is:

[4 Marks]

(A) 6400 J

(B) 5400 J

(C) 7900 J

(D) 8900 J

Question 15.

In thermodynamic processes which of the following statements is not true?

[4 Marks]

(A) In an isochoric process pressure remains constant

(B) In an adiabatic process the system is insulated from the surroundings

(C) In an isothermal process the temperature remains constant

(D) In an adiabatic process PV^{γ} = constant

Question 16.

Which one of the following equations of motion represents simple harmonic motion?

[4 Marks]

(A) Acceleration = $-k_0x + k_1x^2$

(B) Acceleration = $k(x + a)$

(C) Acceleration = kx

(D) Acceleration = $-k(x + a)$

Question 17.

A simple pendulum performs simple harmonic motion about x = 0 with an amplitude a and time period T. The speed of the pendulum at x = a/2 will be:

[4 Marks]

(A) $\pi a\sqrt{3}/T$

(B) π

(C) $\pi a\sqrt{3}/2T$

(D) $3\pi^2 a/T$

Question 18.

A block of mass M is attached to the lower end of a vertical spring. The spring is hung from a ceiling and has force constant value k. The mass is released from rest with the spring initially unstretched. The maximum extension produced in the length of the spring will be:

[4 Marks]

(A) Mg/2k

(B) 4Mg/k

(C) Mg/k

(D) 2Mg/k

Question 19.

A wave in a string has an amplitude of 2 cm. The wave travels in the +ve direction of x axis with a speed of 128 m/sec and it is noted that 5 complete waves fit in 4 m length of the string. The equation describing the wave is

[4 Marks]

(A) y = (0.02) m sin (15.7x − 2010t)

(B) y = (0.02) m sin (15.7x + 2010t)

(C) y = (0.02) m sin (7.85x − 1005t)

(D) y = (0.02) m sin (7.85x + 1005t)

Question 20.

Each of the two strings of length 51.6 cm and 49.1 cm are under tension separately by 20 N force. Mass per unit length of both strings is same and equal to 1 g/m. When both the strings vibrate simultaneously the number of beats is

[4 Marks]

(A) 3

(B) 8

(C) 7

(D) 5

Question 21.

The driver of a car travelling with speed 30 m/s towards a hill sounds a horn of frequency 600 Hz. If the velocity of sound in air is 330 m/s, the frequency of reflected sound as heard by driver is

[4 Marks]

(A) 500 Hz

(B) 555.5 Hz

(C) 550 Hz

(D) 720 Hz

Question 22.

The mean free path of electrons in a metal is 4×10^{-8} m. The electric field which can give on an average 2 eV energy to an electron in the metal will be in units of V/m

[4 Marks]

(A) 5×10^{-11}

(B) 8×10^{-11}

(C) 8×10^{7}

(D) 5×10^{7}

Question 23.

Three concentric spherical shells have radii a, b and c (a < b < c) and have surface charge densities σ, −σ and σ respectively. If V_a, V subscript (B) and V□ denotes the potentials of the three shells, then for c = a + b, we have

[4 Marks]

(A) V□ = V subscript (B) ≠ V_a

(B) V□ ≠ V subscript (B) ≠ V_a

(C) V□ = V subscript (B) = V_a

(D) V□ = V_a ≠ V subscript (B)

Question 24.

The electric potential at a point (x, y, z) is given by $V = -x^2y - xz^3 + 4$.

The electric field □□ at that point is

[4 Marks]

(A) □□ = $\hat{i}z^3 + \hat{j}xyz + \hat{k}z^2$

(B) □□ = $\hat{i}(2xy - z^3) + \hat{j}xy^2 + \hat{k}3z^2x$

(C) □□ = $\hat{i}(2xy + z^3) + \hat{j}x^2 + \hat{k}3xz^2$

(D) □□ = $\hat{i}(2xy + z^3) + \hat{j}(x^2 + y^2) + \hat{k}(3xz - y^2)$

Question 25.

Three capacitors each of capacitance C and of breakdown voltage V are joined in series. The capacitance and breakdown voltage of the combination will be

[4 Marks]

(A) 3C, V/3

(B) C/3, 3V

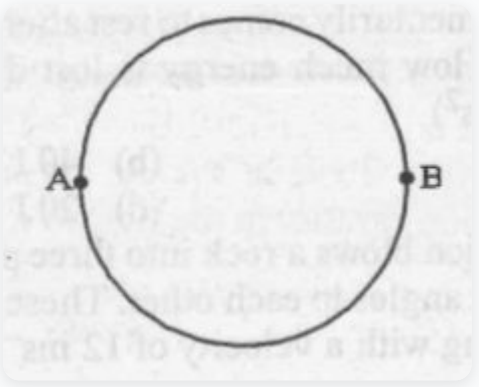
(C) C/3, V/3

(D) 3C, 3V

Question 26.

A wire of resistance 12 ohms per meter is bent to form a complete circle of radius 10 cm. The resistance between its two diametrically opposite points, A and B as shown in the figure, is

[4 Marks]



(A) 0.6πΩ

(B) 6πΩ

(C) 3Ω

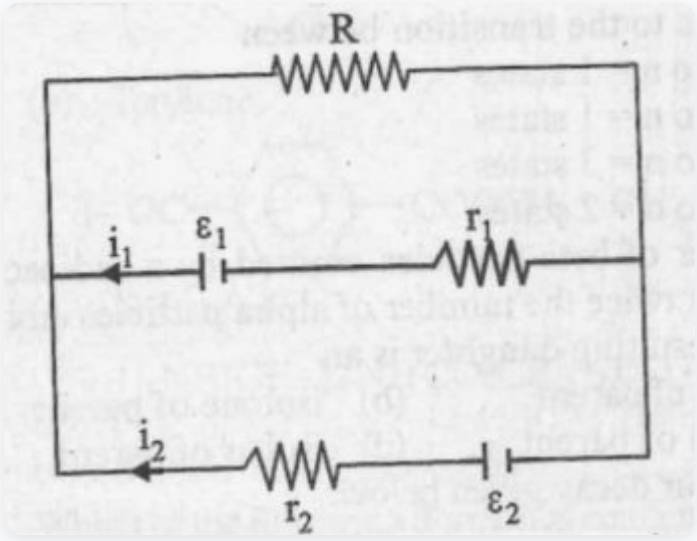
(D) 6Ω

Question 27.

See the electric circuit shown in the figure.

Which of the following equations is a correct equation for it?

[4 Marks]



(A) $\varepsilon_2 - (i_1 + i_2)R + i_2 r_2 = 0$

(B) $\varepsilon_2 - i_2 r_2 - \varepsilon_1 - i_1 r_1 = 0$

(C) $\varepsilon_1 - (i_1 + i_2)R + i_1 r_1 = 0$

(D) $\varepsilon_1 - (i_1 + i_2)R - i_1 r_1 = 0$

Question 28.

A student measures the terminal potential difference (V) of a cell (of emf E and internal resistance r) as a function of the current (I) flowing through it. The slope and intercept of the graph between V and I, then, respectively, equal:

[4 Marks]

(A) r and −E

(B) −r and E

(C) E and −r

(D) −E and r

Question 29.

The magnetic force acting on a charged particle of charge −2 μC in a magnetic field of 2T acting in y direction, when the particle velocity is $(2\hat{i} + 3\hat{j}) \times 10^6$ ms^{-1}, is

[4 Marks]

(A) 8 N in y direction

(B) 4 N in z direction

(C) 8 N in −z direction

(D) 8 N in z direction

Question 30.

Under the influence of a uniform magnetic field, a charged particle moves with constant speed v in a circle of radius R. The time period of rotation of the particle:

[4 Marks]

(A) depends on R and not on v

(B) is independent of both v and R

(C) depends on both v and R

(D) depends on v and not on R

Question 31.

A galvanometer having a coil resistance of 60 Ω shows full scale deflection when a current of 1.0 amp passes through it. It can be converted into an ammeter to read currents upto 5.0 amp by:

[4 Marks]

(A) putting in parallel a resistance of 15 Ω

(B) putting in parallel a resistance of 240 Ω

(C) putting in series a resistance of 240 Ω

(D) putting in series a resistance of 15 Ω

Question 32.

A bar magnet having a magnetic moment of 2×10^4 JT^{-1} is free to rotate in a horizontal plane. A horizontal magnetic field $B = 6 \times 10^{-4}$ T exists in the space. The work done in taking the magnet slowly from a direction parallel to the field to a direction 60° from the field is

[4 Marks]

(A) 12 J

(B) 6 J

(C) 0.6 J

(D) 2 J

Question 33.

If a diamagnetic substance is brought near the north or the south pole of a bar magnet, it is:

[4 Marks]

(A) repelled by both the poles

(B) attracted by both the poles

(C) attracted by the north pole and repelled by the south pole

(D) repelled by the north pole and attracted by the south pole

Question 34.

A rectangular, a square, a circular and an elliptical loop, all in the (x−y) plane, are moving out of a uniform magnetic field with a constant velocity, □□ = vî. The magnetic field is directed along the negative z axis direction. The induced emf, during the passage of these loops, out of the field region, will not remain constant for

[4 Marks]

(A) only the elliptical loop.

(B) the circular and the elliptical loops.

(C) any of the four loops.

(D) the rectangular, circular and elliptical loops.

Question 35.

A conducting circular loop is placed in a uniform magnetic field of 0.04 T with its plane perpendicular to the magnetic field. The radius of the loop starts shrinking at 2 mm/s. The induced emf in the loop when the radius is 2 cm is

[4 Marks]

(A) 3.2 πμV

(B) 1.6 πμV

(C) 4.8 μV

(D) 0.8 πμV

Question 36.

Power dissipated in an LCR series circuit connected to an a.c source of emf ε is

[4 Marks]

(A) $\varepsilon^2 R/\sqrt{[R^2 + (L\omega - 1/C\omega)^2]}$

(B) $\varepsilon^2 R/[R^2 + (L\omega - 1/C\omega)^2]$

(C) $\varepsilon^2[R^2 + (L\omega - 1/C\omega)^2]/R$

(D) $\varepsilon^2\sqrt{[R^2 + (L\omega - 1/C\omega)^2]}/R$

Question 37.

The electric field part of an electromagnetic wave in a medium is represented by $E_x = 0$;

$E_y = 2.5\ N/C \cos[(2\pi \times 10^6\ rad/m)t - (\pi \times 10^{-2}\ rad/s)x]$; $E\square = 0$. The wave is:

[4 Marks]

(A) moving along y direction with frequency $2\pi \times 10^6$ Hz and wavelength 200 m.

(B) moving along −x direction with frequency 10^6 Hz and wavelength 200 m.

(C) moving along x direction with frequency 10^6 Hz and wavelength 200 m.

(D) moving along x direction with frequency 10^6 Hz and wavelength 100 m.

Question 38.

The number of photo electrons emitted for light of a frequency ν (higher than the threshold frequency ν_0) is proportional to:

[4 Marks]

(A) Frequency of light (ν)

(B) $\nu - \nu_0$

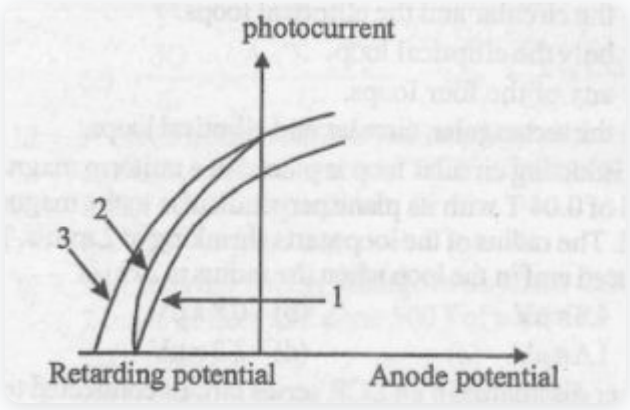
(C) Intensity of light

(D) Threshold frequency (ν_0)

Question 39.

The figure shows a plot of photo current versus anode potential for a photo sensitive surface for three different radiations. Which one of the following is a correct statement?

[4 Marks]



(A) Curves (2) and (3) represent incident radiations of different frequencies and different intensities.

(B) Curves (1) and (2) represent incident radiations of same frequency but of different intensities.

(C) Curves (2) and (3) represent incident radiations of same frequency having same intensity.

(D) Curves (1) and (2) represent incident radiations of different frequencies and different intensities.

Question 40.

Monochromatic light of wavelength 667 nm is produced by a helium neon laser. The power emitted is 9 mW. The number of photons arriving per sec on the average at a target irradiated by this beam is:

[4 Marks]

(A) 9×10^{17}

(B) 3×10^{19}

(C) 9×10^{15}

(D) 3×10^{16}

Question 41.

In a Rutherford scattering experiment when a projectile of charge Z_1 and mass M_1 approaches a target nucleus of charge Z_2 and mass M_2, the distance of closest approach is r_0. The energy of the projectile is

[4 Marks]

(A) directly proportional to $M_1 \times M_2$

(B) directly proportional to mass M_1

(C) directly proportional to Z_1Z_2

(D) inversely proportional to Z_1

Question 42.

The ionization energy of the electron in the hydrogen atom in its ground state is 13.6 eV. The atoms are excited to higher energy levels to emit radiations of 6 wavelengths. Maximum wavelength of emitted radiation corresponds to the transition between

[4 Marks]

(A) n = 3 to n = 2 states

(B) n = 2 to n = 1 states

(C) n = 3 to n = 2 states

(D) n = 4 to n = 3 states

Question 43.

The number of beta particles emitted by a radioactive substance is twice the number of alpha particles emitted by it. The resulting daughter is an

[4 Marks]

(A) isobar of parent

(B) isotone of parent

(C) isotope of parent

(D) isomer of parent

Question 44.

In the nuclear decay given below:

the particles emitted in the sequence are

[4 Marks]

$$ {}^{A}_{Z}X \longrightarrow {}^{A}_{Z+1}Y \longrightarrow {}^{A-4}_{Z-1}B^{*} \longrightarrow {}^{A-4}_{Z-1}B, $$

(A) β, α, γ

(B) α, β, γ

(C) γ, β, α

(D) β, γ, α

Question 45.

A p-n photodiode is fabricated from a semiconductor with a band gap of 2.5 eV. It can detect a signal of wavelength

[4 Marks]

(A) 4000 nm

(B) 6000 nm

(C) 4000 Å

(D) 6000 Å

Question 46.

Sodium has body centred packing. Distance between two nearest atoms is 3.7 Å. The lattice parameter is

[4 Marks]

(A) 3.0 Å

(B) 4.3 Å

(C) 8.6 Å

(D) 6.8 Å

Question 47.

A transistor is operated in common-emitter configuration at VSubscript (C) = 2 V such that a change in the base current from 100 μA to 200 μA produces a change in the collector current from 5 mA to 10 mA. The current gain is

[4 Marks]

(A) 100

(B) 150

(C) 50

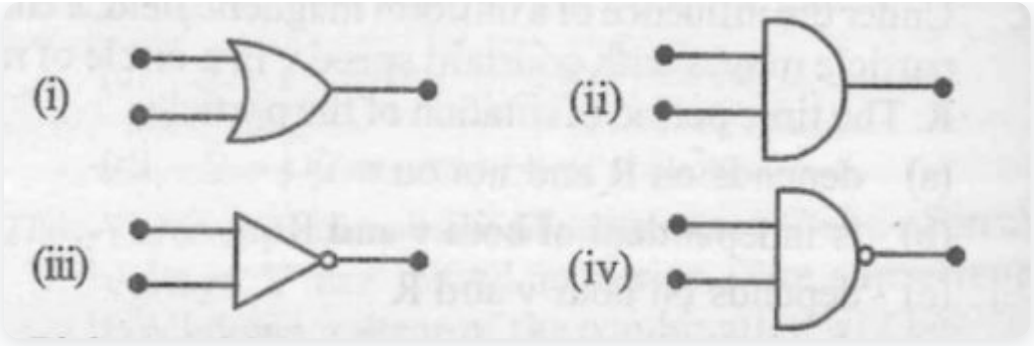
(D) 75

Question 48.

Symbolic representation of four logic gate are shown as

Pick out which ones are for AND, NAND and NOT gates, respectively

[4 Marks]



(A) (ii), (iii) and (iv)

(B) (iii), (iii) and (iv)

(C) (iii), (ii) and (i)

(D) (ii), (iv) and (iii)

Question 49.

Which one of the following is employed as a tranquilizer?

[4 Marks]

(A) Naproxen

(B) Equanil

(C) Chlorpheniramine

(D) Tetracycline

Question 50.

What is the [OH] in the final solution prepared by mixing 20.0 mL of 0.050 M HCl with 30.0 mL of 0.10 M $Ba(OH)_2$?

[4 Marks]

(A) 0.12 M

(B) 0.10 M

(C) 0.0050 M

(D) 0.40 M

Question 51.

10 g of hydrogen and 64 g of oxygen were filled in a steel vessel and exploded. Amount of water produced in this reaction will be:

[4 Marks]

(A) 2 mol

(B) 1 mol

(C) 4 mol

(D) 3 mol

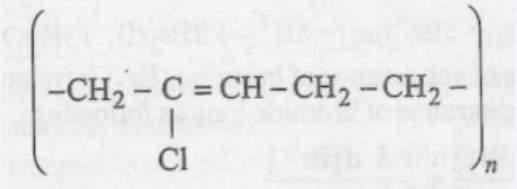
Question 52.

Structures of some common polymers are given. Which one is not correctly presented?

[4 Marks]

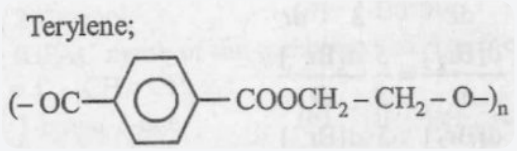
(A)

Neoprene;



(B)

Terylene;



(C)

Nylon 6, 6;

$[-NH(CH_2)_6NHCO(CH_2)_4CO-]_n$

(D)

Teflon; $(-CF_2-CF_2-)_n$

Question 53.

Which of the following hormones contains iodine?

[4 Marks]

(A) Testosterone

(B) Adrenaline

(C) Insulin

(D) Thyroxine

Question 54.

The segment of DNA which acts as the instrumental manual for the synthesis of the protein is:

[4 Marks]

(A) nucleoside

(B) nucleotide

(C) gene

(D) ribose

Question 55.

Nitrobenzene can be prepared from benzene by using a mixture of conc. HNO_3 and conc. H_2SO_4; in the mixture, nitric acid acts as a/an:

[4 Marks]

(A) reducing agent

(B) catalyst

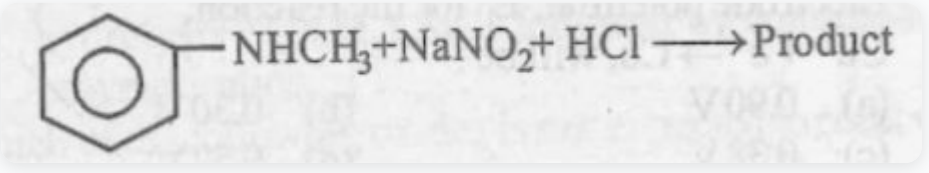
(C) base

(D) acid

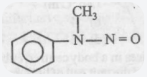
Question 56.

Predict the product:

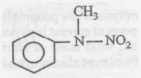
[4 Marks]



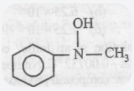
(A)



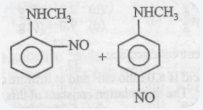
(B) 1



(C)



(D)

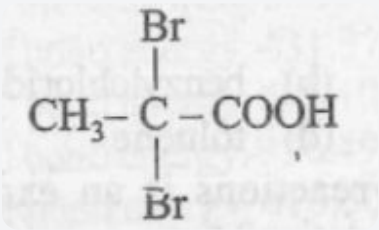


Question 57.

Propionic acid with $Br_2|P$ yields a dibromo product. Its structure would be:

[4 Marks]

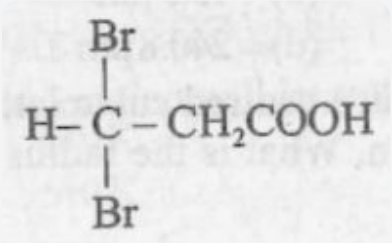
(A)



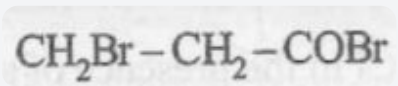
(B)



(C)



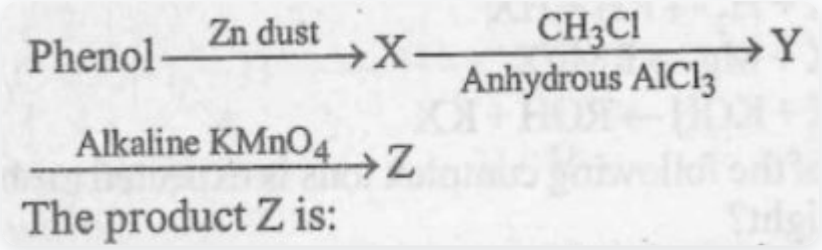
(D)



Question 58.

Consider the following reaction:

[4 Marks]



(A) benzoic acid

(B) benzaldehyde

(C) benzene

(D) toluene

Question 59.

$H_2COH \cdot CH_2OH$ on heating with periodic acid gives:

[4 Marks]

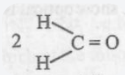
(A)



(B) 2 CO_2

(C) 2 HCOOH

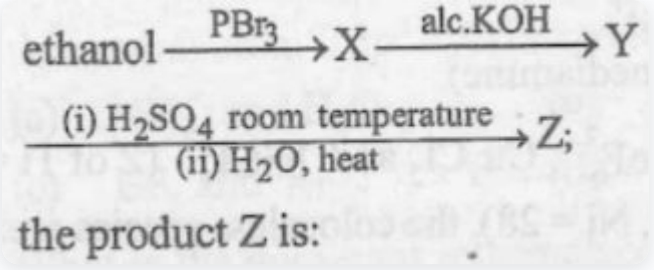
(D)



Question 60.

Consider the following reaction,

[4 Marks]



(A) $CH_3–CH_2–O–SO_3H$

(B) $CH_3CH_2–O–CH_2–CH_3$

(C) CH_3CH_2OH

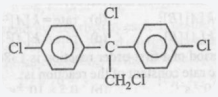
(D) $CH_2=CH_2$

Question 61.

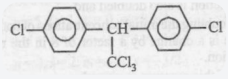
Trichloroacetaldehyde, CCl_3CHO reacts with chlorobenzene in presence of sulphuric acid and produces:

[4 Marks]

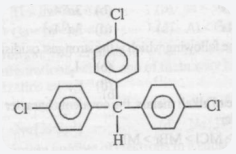
(A)



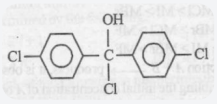
(B)



(C)



(D)



Question 62.

Benzene reacts with CH_3Cl in the presence of anhydrous $AlCl_3$ to form:

[4 Marks]

(A) chlorobenzene

(B) benzylchloride

(C) xylene

(D) toluene

Question 63.

Which of the following reactions is an example of nucleophilic substitution reaction?

[4 Marks]

(A) $RX + H_2 \rightarrow RH + HX$

(B) $2RX + 2Na \rightarrow R–R + 2NaX$

(C) $RX + KOH \rightarrow ROH + KX$

(D) $RX + Mg \rightarrow RMgX$

Question 64.

Which of the following complex ions is expected to absorb visible light?

(At.no. Zn = 30, Sc = 21, Ti = 22, Cr = 24)

[4 Marks]

(A) $[Sc(H_2O)_3(NH_3)_3]^{3+}$

(B) $[Zn(NH_3)_6]^{2+}$

(C) $[Ti(en)_2(NH_3)_2]^{4+}$

(D) $[Cr(NH_3)_6]^{3+}$

Question 65.

Which of the following does not show optical isomerism?

(en = ethylenediamine)

[4 Marks]

(A) $[Co(en)Cl_2(NH_3)_2]^{+}$

(B) $[Co(NH_3)_3Cl_3]^{0}$

(C) $[Co(en)_2Cl_2]^{+}$

(D) $[Co(en)_3]^{3+}$

Question 66.

Out of TiF_6^{2-}, CoF_6^{3-}, Cu_2Cl_2 and $NiCl_4^{2-}$ (Z of Ti = 22, Co = 27, Cu = 29, Ni = 28), the colourless species are:

[4 Marks]

(A) Cu_2Cl_2 and $NiCl_4^{2-}$

(B) CoF_6^{3-} and $NiCl_4^{2-}$

(C) TiF_6^{2-} and Cu_2Cl_2

(D) TiF_6^{2-} and CoF_6^{3-}

Question 67.

Which one of the elements with the following outer orbital configurations may exhibit the largest number of oxidation states?

[4 Marks]

(A) $3d^3 4s^2$

(B) $3d^2 4s^2$

(C) $3d^5 4s^1$

(D) $3d^5 4s^2$

Question 68.

Among the following which is the strongest oxidising agent?

[4 Marks]

(A) Br_2

(B) I_2

(C) F_2

(D) Cl_2

Question 69.

In the case of alkali metals, the covalent character decreases in the order:

[4 Marks]

(A) MCl > MI > MBr > MF

(B) MI > MBr > MCl > MF

(C) MF > MCl > MI > MBr

(D) MF > MCl > MBr > MI

Question 70.

For the reaction A + B ⟶ products, it is observed that:

(1) On doubling the initial concentration of A only, the rate of reaction is also doubled and

(2) On doubling the initial concentrations of both A and B, there is a change by a factor of 8 in the rate of the reaction.

The rate of this reaction is given by:

[4 Marks]

(A) rate = $k[A]^2[B]^3$

(B) rate = $k[A][B]^2$

(C) rate = $k[A][B]$

(D) rate = $k[A]^2[B]$

Question 71.

Half life period of a first-order reaction is 1386 seconds. The specific rate constant of the reaction is

[4 Marks]

(A) $5.0 \times 10^{-3}\ s^{-1}$

(B) $5.0 \times 10^{-2}\ s^{-1}$

(C) $0.5 \times 10^{-3}\ s^{-1}$

(D) $0.5 \times 10^{-2}\ s^{-1}$

Question 72.

In the reaction
$BrO_3^-(aq) + 5Br^-(aq) + 6H^+ \longrightarrow 3Br_2(l) + 3H_2O(l)$

The rate of appearance of bromine (Br_2) is related to rate of disappearance of bromide ions as following:

[4 Marks]

(A) $d[Br_2]/dt = -3/5\ d[Br^-]/dt$

(B) $d[Br_2]/dt = 3/5\ d[Br^-]/dt$

(C) $d[Br_2]/dt = -5/3\ d[Br^-]/dt$

(D) $d[Br_2]/dt = 5/3\ d[Br^-]/dt$

Question 73.

For the reaction, $N_2 + 3H_2 \longrightarrow 2NH_3$

$d[NH_3]/dt = 2 \times 10^{-4}$ mol L^{-1} s^{-1}, the value of $-d[H_2]/dt$ would be:

[4 Marks]

(A) 1×10^{-4} mol L^{-1} s^{-1}

(B) 3×10^{-4} mol L^{-1} s^{-1}

(C) 6×10^{-4} mol L^{-1} s^{-1}

(D) 4×10^{-4} mol L^{-1} s^{-1}

Question 74.

Given:

(i) $Cu^{2+} + 2e^- \longrightarrow Cu$, $E° = 0.337$ V

(ii) $Cu^{2+} + e^- \longrightarrow Cu^+$, $E° = 0.153$ V

Electrode potential, E° for the reaction, $Cu^+ + e^- \longrightarrow Cu$, will be:

[4 Marks]

(A) 0.30 V

(B) 0.90 V

(C) 0.52 V

(D) 0.38 V

Question 75.

Al_2O_3 is reduced by electrolysis at low potentials and high currents. If 4.0×10^4 amperes of current is passed through molten Al_2O_3 for 6 hours, what mass of aluminium is produced? (Assume 100% current efficiency and At. mass of Al = 27 g mol^{-1})

[4 Marks]

(A) 9.0×10^3 g

(B) 2.4×10^5 g

(C) 1.3×10^4 g

(D) 8.1×10^4 g

Question 76.

The equivalent conductance of M/32 solution of a weak monobasic acid is 8.0 mho cm^2 and at infinite dilution is 400 mho cm^2. The dissociation constant of this acid is:

[4 Marks]

(A) 1.25×10^{-5}

(B) 1.25×10^{-4}

(C) 6.25×10^{-4}

(D) 1.25×10^{-6}

Question 77.

A 0.0020 mol aqueous solution of an ionic compound $Co(NH_3)_5(NO_2)Cl$ freezes at −0.00732 °C. Number of moles of ions which 1 mol of compound produces on being dissolved in water will be (K_f = −1.86 °C/m)

[4 Marks]

(A) 3

(B) 4

(C) 2

(D) 1

Question 78.

Lithium metal crystallises in a body centred cubic crystal. If the length of the side of the unit cell of lithium is 351 pm, the atomic radius of the lithium will be:

[4 Marks]

(A) 151.8 pm

(B) 75.5 pm

(C) 240.8 pm

(D) 300.5 pm

Question 79.

Copper crystallises in a face-centred cubic lattice with a unit cell length of 361 pm. What is the radius of copper atom in pm?

[4 Marks]

(A) 128

(B) 108

(C) 157

(D) 181

Question 80.

Which of the following compounds will exhibit cis-trans (geometrical) isomerism?

[4 Marks]

(A) 2-Butene

(B) 2-Butenol

(C) Butanol

(D) 2-Butyne

Question 81.

The IUPAC name of the compound having the formula $CH \equiv C–CH=CH_2$ is:

[4 Marks]

(A) 3-butene-1-yne

(B) 1-butyn-3-ene

(C) 1-butene-3-yne

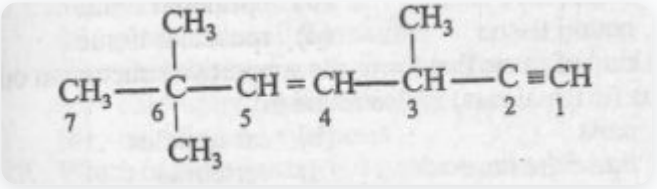
(D) but-1-yne-3-ene

Question 82.

The state of hybridization of C_2, C_3, C_5 and C_6 of the hydrocarbon,

in the following sequence:

[4 Marks]



(A) sp, sp^3, sp^2 and sp^3

(B) sp, sp^2, sp^3 and sp^2

(C) sp, sp^2, sp^2 and sp^3

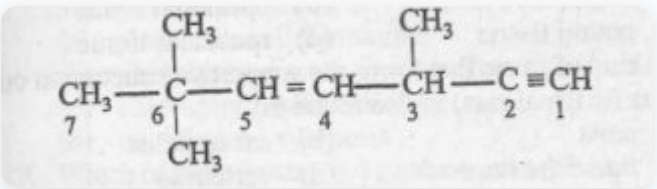
(D) sp^3, sp^2, sp^2 and sp

Question 83.

The state of hybridization of C_2, C_3, C_5 and C_6 of the hydrocarbon,

is in the following sequence:

[4 Marks]



(A) sp^3, sp^2, sp^2 and sp

(B) sp, sp^2, sp^2 and sp^3

(C) sp, sp^2, sp^3 and sp^2

(D) sp, sp^3, sp^2 and sp^3

Question 84.

The straight chain polymer is formed by

[4 Marks]

(A) hydrolysis of $(CH_3)_2SiCl_2$ followed by condensation polymerisation

(B) hydrolysis of $(CH_3)_3SiCl$ followed by condensation polymerisation

(C) hydrolysis of $(CH_3)_4Si$ by addition polymerisation

(D) hydrolysis of CH_3SiCl_3 followed by condensation polymerisation

Question 85.

Which of the following oxides is not expected to react with sodium hydroxide?

[4 Marks]

(A) SiO_2

(B) CaO

(C) B_2O_3

(D) BeO

Question 86.

Oxidation numbers of P in PO_4^{3-}, of S in SO_4^{2-} and that of Cr in $Cr_2O_7^{2-}$ are respectively

[4 Marks]

(A) −3, +6 and +6

(B) +5, +6 and +6

(C) +3, +6 and +5

(D) +5, +3 and +6

Question 87.

The ionization constant of ammonium hydroxide is 1.77×10^{-5} at 298 K. Hydrolysis constant of ammonium chloride is:

[4 Marks]

(A) 5.65×10^{-13}

(B) 6.50×10^{-12}

(C) 5.65×10^{-10}

(D) 5.65×10^{-12}

Question 88.

Which of the following molecules acts as a Lewis acid?

[4 Marks]

(A) $(CH_3)_2O$

(B) $(CH_3)_3P$

(C) $(CH_3)_3N$

(D) $(CH_3)_3B$

Question 89.

The dissociation constants for acetic acid and HCN at 25°C are 1.5×10^{-5} and 4.5×10^{-10} respectively. The equilibrium constant for the equilibrium $CN^- + CH_3COOH \rightleftharpoons HCN + CH_3COO^-$ would be:

[4 Marks]

(A) 3.0×10^4

(B) 3.0×10^{-4}

(C) 3.0×10^5

(D) 3.0×10^{-5}

Question 90.

The values of ΔH and ΔS for the reaction, C(graphite) + $CO_2(g) \longrightarrow 2CO(g)$ are 170 kJ and 170 JK^{-1}, respectively. This reaction will be spontaneous at

[4 Marks]

(A) 710 K

(B) 1110 K

(C) 510 K

(D) 910 K

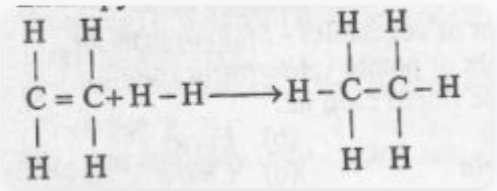
Question 91.

From the following bond energies:
H–H bond energy: 431.37 kJ mol^{-1}
C=C bond energy: 606.10 kJ mol^{-1}
C–C bond energy: 336.49 kJ mol^{-1}
C–H bond energy: 410.50 kJ mol^{-1}

Enthalpy for the reaction,

will be:

[4 Marks]



(A) −120.0 kJ mol^{-1}

(B) −243.6 kJ mol^{-1}

(C) 553.0 kJ mol^{-1}

(D) 1523.6 kJ mol^{-1}

Question 92.

According to MO theory which of the following lists ranks the nitrogen species in terms of increasing bond order?

[4 Marks]

(A) $N_2 < N_2^{2-} < N_2^-$

(B) $N_2^{2-} < N_2^- < N_2$

(C) $N_2^{2-} < N_2 < N_2^-$

(D) $N_2^- < N_2 < N_2^{2-}$

Question 93.

In which of the following molecules / ions BF_3, NO_2^-, NH_2^- and H_2O, is the central atom sp^2 hybridized?

[4 Marks]

(A) NO_2^- and NH_2^-

(B) BF_3 and NO_2^-

(C) NO_2^- and H_2O

(D) NH_2^- and H_2O

Question 94.

What is the dominant intermolecular force or bond that must be overcome in converting liquid CH_3OH to a gas?

[4 Marks]

(A) Hydrogen bonding

(B) Covalent bonds

(C) Dipole-dipole interaction

(D) London dispersion force

Question 95.

The stability of +1 oxidation state increases in the sequence:

[4 Marks]

(A) In < Tl < Ga < Al

(B) Al < Ga < In < Tl

(C) Tl < In < Ga < Al

(D) Ga < In < Al < Tl

Question 96.

Amongst the elements with following electronic configurations, which of them may have the highest ionization energy?

[4 Marks]

(A) Ne [$3s^2 3p^1$]

(B) Ne [$3s^2 3p^3$]

(C) Ne [$3s^2 3p^2$]

(D) Ar [$3d^{10} 4s^2 4p^3$]

Question 97.

Maximum number of electrons in a sub shell of an atom is determined by the following:

[4 Marks]

(A) $2n^2$

(B) 4l + 2

(C) 4l − 2

(D) 2l + 1

Question 98.

Which of the following is not permissible arrangement of electrons in an atom?

[4 Marks]

(A) n = 3, l = 2, m = −2, s = −1/2

(B) n = 3, l = 2, m = −3, s = −1/2

(C) n = 4, l = 0, m = 0, s = −1/2

(D) n = 5, l = 3, m = 0, s = +1/2

Question 99.

The energy absorbed by each molecule (A_2) of a substance is 4.4×10^{-19} J and bond energy per molecule is 4.0×10^{-19} J. The kinetic energy of molecule per atom will be:

[4 Marks]

(A) 2.0×10^{-20} J

(B) 4.0×10^{-20} J

(C) 2.0×10^{-19} J

(D) 2.2×10^{-19} J

Question 100.

Which one is the wrong pairing for the disease and its causal organism?

[4 Marks]

(A) Late blight of potato – Alternaria solani

(B) Root-knot of vegetables – Meloidogyne sp

(C) Black rust of wheat – Puccinia graminis

(D) Loose smut of wheat – Ustilago nuda

Question 101.

Mannitol is the stored food in:

[4 Marks]

(A) Fucus

(B) Chara

(C) Porphyra

(D) Gracillaria

Question 102.

Which one of the following plants is monoecious?

[4 Marks]

(A) Pinus

(B) Cycas

(C) Papaya

(D) Marchantia

Question 103.

Which one of the following is a vascular cryptogam?

[4 Marks]

(A) Marchantia

(B) Ginkgo

(C) Equisetum

(D) Cedrus

Question 104.

Which one of the following has haplontic life cycle?

[4 Marks]

(A) Funaria

(B) Wheat

(C) Ustilago

(D) Polytrichum

Question 105.

Which one of the following groups of animals is bilaterally symmetrical and triploblastic?

[4 Marks]

(A) Aschelminthes (round worms)

(B) Ctenophores

(C) Sponges

(D) Coelenterates (Cnidarians)

Question 106.

Which one of the following pairs of animals comprises jawless fishes?

[4 Marks]

(A) Mackerals and Rohu

(B) Lampreys and hag fishes

(C) Lampreys and eels

(D) Guppies and hag fishes

Question 107.

An example of axile placentation is:

[4 Marks]

(A) Dianthus

(B) Marigold

(C) Lemon

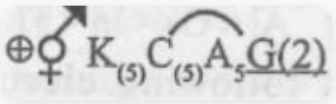
(D) Argemone

Question 108.

The floral formula

is that of:

[4 Marks]



(A) Tulip

(B) Sunhemp

(C) Tobacco

(D) Soyabean

Question 109.

Reduction in vascular tissue, mechanical tissue and cuticle is characteristic of:

[4 Marks]

(A) mesophytes

(B) epiphytes

(C) xerophytes

(D) hydrophytes

Question 110.

Palisade parenchyma is absent in leaves of:

[4 Marks]

(A) sorghum

(B) soybean

(C) gram

(D) mustard

Question 111.

Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by

[4 Marks]

(A) absence of secondary phloem

(B) presence of cortex

(C) position of protoxylem

(D) absence of secondary xylem

Question 112.

The annular and spirally thickened conducting elements generally develop in the protoxylem when the root or stem is:

[4 Marks]

(A) elongating

(B) widening

(C) differentiating

(D) maturing

Question 113.

In barley stem vascular bundles are:

[4 Marks]

(A) open and in a ring

(B) closed and radial

(C) open and scattered

(D) closed and scattered

Question 114.

The epithelial tissue present on the inner surface of bronchioles and fallopian tube is:

[4 Marks]

(A) cuboidal

(B) squamous

(C) ciliated

(D) glandular

Question 115.

The cell junctions called tight, adhering and gap junctions are found in

[4 Marks]

(A) muscular tissue

(B) neural tissue

(C) connective tissue

(D) epithelial tissue

Question 116.

The kind of tissue that forms the supportive structure in our pinna (external ears) is also found in:

[4 Marks]

(A) nails

(B) ear ossicles

(C) tip of the nose

(D) vertebrae

Question 117.

If a live earthworm is pricked with a needle on its outer surface without damaging its gut, the fluid that comes out is:

[4 Marks]

(A) excretory fluid

(B) slimy mucus

(C) coelomic fluid

(D) haemolymph

Question 118.

Which one of the following correctly describes the location of some body parts in the earthworm *Pheretima*?

[4 Marks]

(A) Four pairs of spermathecae in 4–7 segments.

(B) One pair of ovaries attached at intersegmental septum of 14th and 15th segments.

(C) Two pairs of accessory glands in 16–18 segments.

(D) Two pairs of testes in 10th and 11th segments.

Question 119.

Plasmodesmata are:

[4 Marks]

(A) lignified cemented layers between cells

(B) membranes connecting the nucleus with plasmalemma

(C) connections between adjacent cells

(D) locomotary structures

Question 120.

Cytoskeleton is made up of:

[4 Marks]

(A) callose deposits

(B) cellulosic microfibrils

(C) proteinaceous filaments

(D) calcium carbonate granules

Question 121.

Stroma in the chloroplasts of higher plant contains:

[4 Marks]

(A) light-dependent reaction enzymes

(B) ribosomes

(C) chlorophyll

(D) light-independent reaction enzymes

Question 122.

Middle lamella is composed mainly of:

[4 Marks]

(A) muramic acid

(B) calcium pectate

(C) hemicellulose

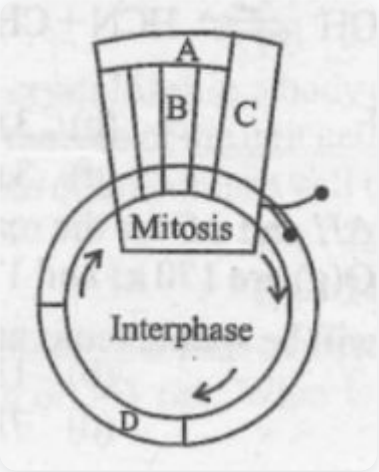
(D) phosphoglycerides

Question 123.

Given below is a schematic break-up of the phases / stages of cell cycle:

Which one of the following is the correct indication of the stage/phase in the cell cycle?

[4 Marks]



(A) C – Karyokinesis

(B) D – Synthetic phase

(C) B – Metaphase

(D) A – Cytokinesis

Question 124.

Synapsis occurs between:

[4 Marks]

(A) mRNA and ribosomes

(B) two homologous chromosomes

(C) a male and a female gamete

(D) spindle fibres and centromere

Question 125.

Guard cells help in:

[4 Marks]

(A) protection against grazing

(B) fighting against infection

(C) transpiration

(D) guttation

Question 126.

Manganese is required in:

[4 Marks]

(A) photolysis of water during photosynthesis

(B) plant cell wall formation

(C) chlorophyll synthesis

(D) nucleic acid synthesis

Question 127.

Which of the following is a symbiotic nitrogen fixer?

[4 Marks]

(A) Azotobacter

(B) Frankia

(C) Azolla

(D) Glomus

Question 128.

Oxygenic photosynthesis occurs in:

[4 Marks]

(A) Chromatium

(B) Chlorobium

(C) Rhodospirillum

(D) Oscillatoria

Question 129.

Cyclic photophosphorylation results in the formation of

[4 Marks]

(A) ATP

(B) ATP, NADPH and O_2

(C) ATP and NADPH

(D) NADPH

Question 130.

Aerobic respiratory pathway is appropriately termed:

[4 Marks]

(A) amphibolic

(B) parabolic

(C) catabolic

(D) anabolic

Question 131.

One of the synthetic auxin is:

[4 Marks]

(A) NAA

(B) IBA

(C) GA

(D) IAA

Question 132.

Which one of the following acids is a derivative of carotenoids?

[4 Marks]

(A) Abscisic acid

(B) Indole butyric acid

(C) Gibberellic acid

(D) Indole-3-acetic acid

Question 133.

Synapsis occurs between:

[4 Marks]

(A) mRNA and ribosomes

(B) two homologous chromosomes

(C) spindle fibres and centromere

(D) a male and a female gamete

Question 134.

A young infant may be feeding entirely on mothers milk which is white in colour but the stools which the infant passes out is quite yellowish. What is this yellow colour due to?

[4 Marks]

(A) bile pigments passed through bile juice

(B) undigested milk protein casein

(C) pancreatic juice poured into duodenum

(D) intestinal juice

Question 135.

Which one of the following statements is true regarding digestion and absorption of food in humans?

[4 Marks]

(A) Fructose and amino acids are absorbed through intestinal mucosa with the help of carrier ions like Na^+.

(B) Chylomicrons are small lipoprotein particles that are transported from intestine into blood capillaries.

(C) Oxyntic cells in our stomach secrete the proenzyme pepsinogen.

(D) About 60% of starch is hydrolysed by salivary amylase in our mouth.

Question 136.

Which one of the following pairs of food components in humans reaches the stomach totally undigested?

[4 Marks]

(A) Starch and fat

(B) Fat and cellulose

(C) Starch and cellulose

(D) Protein and starch

Question 137.

When breast feeding is replaced by less nutritive food low in proteins and calories; the infants below the age of one year are likely to suffer from:

[4 Marks]

(A) Rickets

(B) Kwashiorkor

(C) Pellagra

(D) Marasmus

Question 138.

The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC, because “O” in it refers to having:

[4 Marks]

(A) overdominance of this type on the genes for A and B types.

(B) one antibody only - either anti-A or anti-B on the RBC.

(C) no antigens A and B on RBCs.

(D) other antigens besides A and B on RBCs.

Question 139.

Compared to blood our lymph has:

[4 Marks]

(A) plasma without proteins

(B) more WBCs and no RBCs

(C) more RBCs and less WBCs

(D) no plasma

Question 140.

There is no DNA in:

[4 Marks]

(A) mature RBCs

(B) a mature spermatozoan

(C) hair root

(D) an enucleated ovum

Question 141.

Globulins contained in human blood plasma are primarily involved in:

[4 Marks]

(A) oxygen transport in the blood.

(B) osmotic balance of body fluids.

(C) clotting of blood.

(D) defence mechanisms of body.

Question 142.

In a standard ECG which one of the following alphabets is the correct representation of the respective activity of the human heart?

[4 Marks]

(A) S - start of systole

(B) T - end of diastole

(C) R - repolarisation of ventricles

(D) P - depolarisation of the atria

Question 143.

Uric acid is the chief nitrogenous component of the excretory products of:

[4 Marks]

(A) earthworm

(B) cockroach

(C) frog

(D) man

Question 144.

What will happen if the stretch receptors of the urinary bladder wall are totally removed?

[4 Marks]

(A) Urine will continue to collect normally in the bladder

(B) Urine will not collect in the bladder

(C) Micturition will continue

(D) There will be no micturition

Question 145.

Which one of the following is the correct matching of three items and their grouping category?

Option	Items	Group
(a)	ilium, ischium, pubis	coxal bones of pelvic girdle
(b)	actin, myosin, rhodopsin	muscle proteins

(c)	cytosine, uracil, thiamine	pyrimidines
(d)	malleus, incus, cochlea	ear ossicles

[4 Marks]

(A) cytosine, uracil, thiamine – pyrimidines

(B) actin, myosin, rhodopsin – muscle proteins

(C) malleus, incus, cochlea – ear ossicles

(D) ilium, ischium, pubis – coxal bones of pelvic girdle

Question 146.

Elbow joint is an example of:

[4 Marks]

(A) hinge joint

(B) gliding joint

(C) ball and socket joint

(D) pivot joint

Question 147.

Which part of human brain is concerned with the regulation of body temperature?

[4 Marks]

(A) Cerebrum

(B) Cerebellum

(C) Hypothalamus

(D) Medulla Oblongata

Question 148.

Alzheimer disease in humans is associated with the deficiency of:

[4 Marks]

(A) acetylcholine

(B) glutamic acid

(C) dopamine

(D) gamma aminobutyric acid (GABA)

Question 149.

A health disorder that results from the deficiency of thyroxine in adults and characterised by (i) a low metabolic rate, (ii) increase in body weight and (iii) tendency to retain water in tissues is:

[4 Marks]

(A) simple goitre

(B) myxoedema

(C) cretinism

(D) hypothyroidism

Question 150.

Vegetative propagation in mint occurs by:

[4 Marks]

(A) offset

(B) rhizome

(C) sucker

(D) runner

Question 151.

A fruit developed from hypanthodium inflorescence is called

[4 Marks]

(A) Sorosis

(B) Syconus

(C) Caryopsis

(D) Hesperidium

Question 152.

Cotyledons and testa respectively are edible parts in

[4 Marks]

(A) walnut and tamarind

(B) french bean and coconut

(C) cashew nut and litchi

(D) groundnut and pomegranate

Question 153.

An example of a seed with endosperm, perisperm, and caruncle is

[4 Marks]

(A) coffee

(B) lily

(C) cotton

(D) castor

Question 154.

Seminal plasma in humans is rich in

[4 Marks]

(A) fructose and calcium but has no enzymes

(B) glucose and certain enzymes but has no calcium

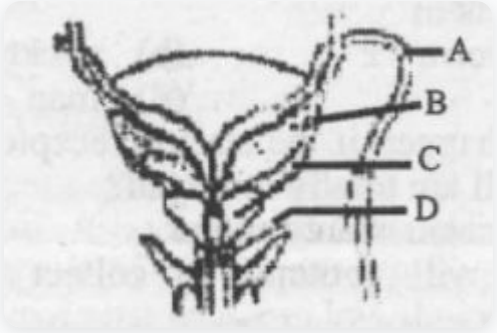
(C) fructose and certain enzymes but poor in calcium

(D) fructose, calcium and certain enzymes

Question 155.

Given below is a diagrammatic sketch of a portion of human male reproductive system. Select the correct set of the names of the parts labelled A, B, C, D.

[4 Marks]



(A) ureter (A); seminal vesicle (B); prostate (C); bulbourethral gland (D).

(B) ureter (A); prostate (B); seminal vesicle (C); bulbourethral gland (D).

(C) vas deferens (A); seminal vesicle (B); bulbourethral gland (C); prostate (D).

(D) vas deferens (A); seminal vesicle (B); prostate (C); bulbourethral gland (D).

Question 156.

Which one of the following is the correct matching of the events occurring during menstrual cycle?

[4 Marks]

(A) Ovulation: LH and FSH attain peak level and sharp fall in the secretion of progesterone.

(B) Menstruation: Breakdown of myometrium and ovum not fertilised.

(C) Development of corpus luteum : Secretory phase and increased secretion of progesterone.

(D) Proliferative phase: Rapid regeneration of myometrium and maturation of Graafian follicle.

Question 157.

Which one of the following is the most likely root cause why menstruation is not taking place in regularly cycling human female?

[4 Marks]

(A) maintenance of the hypertrophical endometrial lining

(B) fertilisation of the ovum

(C) retention of well-developed corpus luteum

(D) maintenance of high concentration of sex hormones in the blood stream

Question 158.

Foetal ejection reflex in human female is induced by

[4 Marks]

(A) release oxytocin from pituitary

(B) fully developed foetus and placenta

(C) differentiation of mammary glands

(D) pressure exerted by amniotic fluid

Question 159.

A change in the amount of yolk and its distribution in the egg will affect

[4 Marks]

(A) pattern of cleavage

(B) number of blastomeres produced

(C) formation of zygote

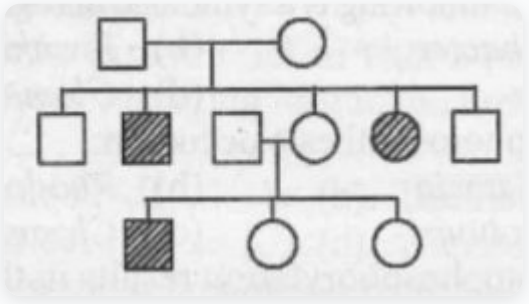
(D) fertilization

Question 160.

Study the pedigree chart given below:

What does it show?

[4 Marks]



(A) The pedigree chart is wrong as this is not possible

(B) Inheritance of a condition like phenylketonuria as an autosomal recessive trait

(C) Inheritance of a recessive sex-linked disease like haemophilia

(D) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria

Question 161.

The genetic defect - Adenosine deaminase (ADA) deficiency may be cured permanently by:

[4 Marks]

(A) introducing bone marrow cells producing ADA into cells at early embryonic stages.

(B) enzyme replacement therapy.

(C) periodic infusion of genetically engineered lymphocytes having functional ADA cDNA.

(D) administering adenosine deaminase activators.

Question 162.

Sickle cell anaemia is:

[4 Marks]

(A) caused by a change in a single base pair of DNA

(B) caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin

(C) characterized by elongated sickle like RBCs with a nucleus

(D) an autosomal linked dominant trait

Question 163.

Select the incorrect statement from the following:

[4 Marks]

(A) Small population size results in random genetic drift in a population

(B) Galactosemia is an inborn error of metabolism

(C) Baldness is a sex-limited trait

(D) Linkage is an exception to the principle of independent assortment in heredity

Question 164.

Point mutation involves:

[4 Marks]

(A) duplication

(B) change in single base pair

(C) insertion

(D) deletion

Question 165.

T.O. Diener discovered a:

[4 Marks]

(A) bacteriophage

(B) infectious protein

(C) free infectious DNA

(D) free infectious RNA

Question 166.

What is not true for genetic code?

[4 Marks]

(A) It is degenerate

(B) It is nearly universal

(C) It is unambiguous

(D) A codon in mRNA is read in a non contiguous fashion

Question 167.

Removal of introns and joining the exons in a defined order in a transcription unit is called:

[4 Marks]

(A) tailing

(B) transformation

(C) capping

(D) splicing

Question 168.

Whose experiments cracked the DNA and discovered unequivocally that a genetic code is a ‘triplet’.

[4 Marks]

(A) Hershey and Chase

(B) Morgan and Sturtevant

(C) Nirenberg and Matthaei

(D) Beadle and Tatum

Question 169.

Semi-conservative replication of DNA was first demonstrated in:

[4 Marks]

(A) Escherichia coli

(B) Streptococcus pneumoniae

(C) Salmonella typhimurium

(D) Drosophila melanogaster

Question 170.

Peripatus is a connecting link between:

[4 Marks]

(A) Mollusca and Echinodermata

(B) Annelida and Arthropoda

(C) Coelenterata and Porifera

(D) Ctenophora and Platyhelminthes

Question 171.

In the case of peppered moth (Biston betularia) the black-coloured form became dominant over the light-coloured form in England during industrial revolution. This is an example of:

[4 Marks]

(A) appearance of the darker coloured individuals due to very poor sunlight

(B) protective mimicry

(C) inheritance of darker colour character acquired due to the darker environment

(D) natural selection whereby the darker forms were selected

Question 172.

A person likely to develop tetanus is immunised by administering

[4 Marks]

(A) preformed antibodies

(B) wide spectrum antibiotics

(C) dead germs

(D) weakened germs

Question 173.

The letter T in T-lymphocyte refers to

[4 Marks]

(A) Thalamus

(B) Tonsil

(C) Thymus

(D) Thyroid

Question 174.

Use of anti-histamines and steroids give a quick relief from

[4 Marks]

(A) nausea

(B) cough

(C) headache

(D) allergy

Question 175.

Which of the following is a pair of viral diseases?

[4 Marks]

(A) Dysentery, common cold

(B) Common cold, AIDS

(C) yphoid, tuberculosis

(D) Ringworm, AIDS

Question 176.

Which one of the following statements is correct?

[4 Marks]

(A) Heroin accelerates body functions.

(B) Benign tumours show the property of metastasis.

(C) Malignant tumours occurs may exhibit metastasis.

(D) Patients who have undergone surgery are given cannabinoids to relieve pain.

Question 177.

Which of the following is not used as a biopesticide?

[4 Marks]

(A) Trichoderma harzianum

(B) Nuclear Polyhedrosis Virus (NPV)

(C) Xanthomonas campestris

(D) Bacillus thuringiensis

Question 178.

Which of the following plant species you would select for the production of bioethanol?

[4 Marks]

(A) Brassica

(B) Jatropha

(C) Zea mays

(D) Pongamia

Question 179.

Somaclones are obtained by

[4 Marks]

(A) plant breeding

(B) irradiation

(C) tissue culture

(D) genetic engineering

Question 180.

Which one of the following pairs is wrongly matched?

[4 Marks]

(A) Alcohol – nitrogenase

(B) Fruit juice – pectinase

(C) Textile – amylase

(D) Detergents – lipase

Question 181.

Polyethylene glycol method is used for

[4 Marks]

(A) biodiesel production

(B) seedless fruit production

(C) energy production from sewage

(D) gene transfer without a vector

Question 182.

Which one of the following is commonly used in transfer of foreign DNA into crop plants?

[4 Marks]

(A) Trichoderma harzianum

(B) Agrobacterium tumefaciens

(C) Penicillium expansum

(D) Meloidogyne incognita

Question 183.

What is true about Bt toxin?

[4 Marks]

(A) Bt protein exists as active toxin in the Bacillus

(B) The activated toxin enters the ovaries of the pest to sterilise it and thus prevent its multiplication.

(C) The concerned Bacillus has antitoxins.

(D) The inactive protoxin gets converted into active form in the insect gut.

Question 184.

The bacterium *Bacillus thuringiensis* is widely used in contemporary biotechnology as

[4 Marks]

(A) indicator of water pollution

(B) agent for production of dairy products

(C) source of industrial enzyme

(D) insecticide

Question 185.

Transgenic plants are the ones:

[4 Marks]

(A) generated by introducing foreign DNA into a cell and regenerating a plant from that cell.

(B) produced after protoplast fusion in artificial medium.

(C) produced by a somatic embryo in artificial medium.

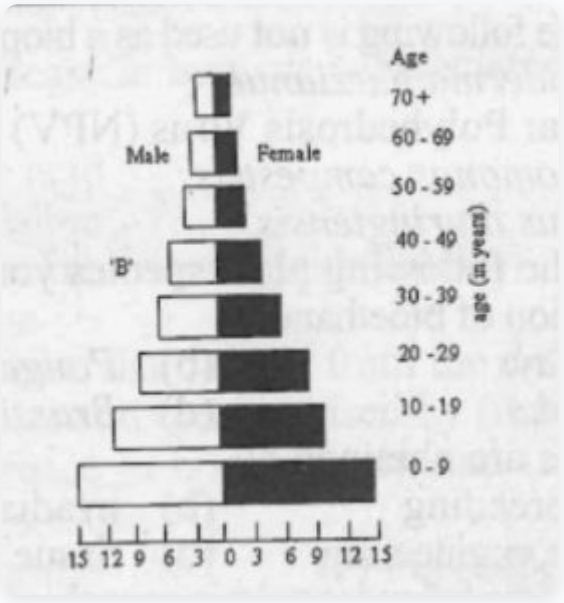
(D) grown in artificial medium after hybridization in the field.

Question 186.

A country with a high rate of population growth took measures to reduce it. The Figure below shows age-sex pyramids of populations A and B twenty years apart.

Select the correct interpretation about them: Interpretations:

[4 Marks]



(A) “B” is earlier pyramid and shows stabilised growth rate.

(B) “B” is more recent showing that population is very young.

(C) “A” is the earlier pyramid and no change has occurred in the growth rate.

(D) “A” is more recent and shows slight reduction in the growth rate.

Question 187.

The correct sequence of plants in a hydrosere is:

[4 Marks]

(A) Volvox → Hydrilla → Pistia → Scirpus → Lantana → Oak

(B) Pistia → Volvox → Scirpus → Hydrilla → Oak → Lantana

(C) Oak → Lantana → Volvox → Hydrilla → Pistia → Scirpus

(D) Oak → Lantana → Scirpus → Pistia → Hydrilla → Volvox

Question 188.

Which one of the following types of organisms occupy more than one trophic level in a pond ecosystem?

[4 Marks]

(A) Zooplankton

(B) Fish

(C) Frog

(D) Phytoplankton

Question 189.

Which one of the following has maximum genetic diversity in India?

[4 Marks]

(A) Mango

(B) Wheat

(C) Tea

(D) Teak

Question 190.

Steps taken by the Government of India to control air pollution include:

[4 Marks]

(A) compulsory PUC (Pollution Under Control) certification of petrol driven vehicles which tests for carbon monoxide and hydrocarbons.

(B) permission to use only pure diesel with a maximum of 500 ppm sulphur as fuel for vehicles.

(C) compulsory mixing of 20% ethyl alcohol with petrol and 20% biodiesel with diesel.

(D) use of non-polluting Compressed Natural Gas (CNG) only as fuel by all buses and trucks.

Question 191.

Biochemical Oxygen Demand (BOD) in a river water

[4 Marks]

(A) has no relationship with concentration of oxygen in the water.

(B) gives a measure of Salmonella in the water.

(C) remains unchanged when algal bloom occurs.

(D) increases when sewage gets mixed with river water.

Question 192.

DDT residues are rapidly passed through food chain causing biomagnification because DDT is

[4 Marks]

(A) moderately toxic

(B) non-toxic to aquatic animals

(C) water soluble

(D) lipo soluble

Question 193.

Global agreement in specific control strategies to reduce the release of ozone depleting substances, was adopted by

[4 Marks]

(A) The Montreal Protocol

(B) The Kyoto Protocol

(C) The Vienna Convention

(D) Rio de Janeiro Conference

Question 194.

Montreal protocol aims at

[4 Marks]

(A) Control of water pollution

(B) Biodiversity conservation

(C) Control of CO_2 emission

(D) Reduction of ozone depleting substances

Question 195.

Chipko movement was launched for the protection of

[4 Marks]

(A) forests

(B) livestock

(C) wet lands

(D) grasslands

Question 196.

Tiger is not a resident in which one of the following national park?

[4 Marks]

(A) Sunderbans

(B) Gir

(C) Jim Corbett

(D) Ranthambhor

Question 197.

The correct sequence of spermatogenetic stages leading to the formation of sperms in a mature human testis is:

[4 Marks]

(A) Spermatogonia → spermatid → spermatocyte → sperms

(B) Spermatocyte → spermatogonia → spermatid → sperms

(C) Spermatid → spermatocyte → spermatogonia → sperms

(D) Spermatogonia → spermatocyte → spermatid → sperms

Question 198.

Which one of the following is considered important in the development of seed habit?

[4 Marks]

(A) Free-living gametophyte

(B) Dependent sporophyte

(C) Heterospory

(D) Haplontic life cycle

Question 199.

Which of the following is a symbiotic nitrogen fixer?

[4 Marks]

(A) Azolla

(B) Azotobacter

(C) Glomus

(D) Frankia

Question 200.

Which one of the following has maximum genetic diversity in India?

[4 Marks]

(A) Tea

(B) Teak

(C) Mango

(D) Wheat