CBSE EXAMINATION PAPER-2006

NEET-CHEMISTRY

(Solved)

Time allowed : 3 hours | Maximum Marks : 796

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **199 questions.** All questions are **compulsory.**

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

iii. **Section A** – questions number **1 to 199** 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.

The velocity v of a particle at time t is given by v = at + b / t + c , where a, b and c are constant. The dimensions of a, b and c are respectively

[4 Marks]

(A) [L, LT and T^2]

(B) [L^2, T and LT^2]

(C) [LT^{-2}, L and T]

(D) [LT^2, LT and L]

Question 2.

A particle moves along a straight line OX. At a time t (in seconds) the distance x (in metres) of the particle from O is given by $x = 40 + 12t - t^3$.
How long would the particle travel before coming to rest?

[4 Marks]

(A) 40 m

(B) 56 m

(C) 16 m

(D) 24 m

Question 3.

Two bodies, A (of mass 1 kg), and B (of mass 3 kg), are dropped from heights of 16 m and 25 m, respectively. The ratio of the time taken by them to reach the ground is

[4 Marks]

(A) 5 / 12

(B) 12 / 5

(C) 4 / 5

(D) 5 / 4

Question 4.

For angles of projection of a projectile $(45^\circ - \theta)$ and $(45^\circ + \theta)$, the horizontal ranges described by the projectile are in the ratio of

[4 Marks]

(A) 1 : 3

(B) 1 : 2

(C) 2 : 1

(D) 1 : 1

Question 5.

A car runs at a constant speed on a circular track of radius 100 m, taking 62.8 seconds in every circular loop. The average velocity and average speed for each circular loop are respectively,

[4 Marks]

(A) 0, 10 m/s

(B) 10 m/s, 10 m/s

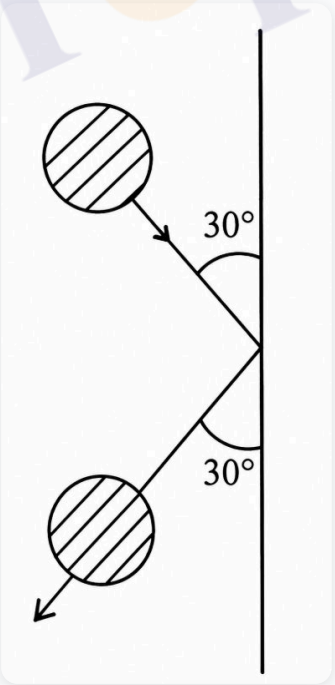
(C) 10 m/s, 0

(D) 0, 0

Question 6.

A 0.5 kg ball moving with speed of 12 m/s strikes a hard wall at an angle of 30° with the wall. It is reflected with the same speed and at the same angle. If the ball is in contact with the wall for 0.25 seconds, the average force acting on the wall is

[4 Marks]



(A) 24 N

(B) 96 N

(C) 12 N

(D) 48 N

Question 7.

The vectors ?⃗ and ?⃗ are such that

|?⃗ + ?⃗| = |?⃗ − ?⃗|

The angle between the two vectors is

[4 Marks]

(A) 45°

(B) 75°

(C) 60°

(D) 90°

Question 8.

A body of mass 3 kg is under a constant force which causes a displacement s in metres in it, given by the relation $s = 1 / 3\ t^2$, where t is in seconds. Work done by the force in 2 seconds is

[4 Marks]

(A) (3 / 8)J

(B) (5 / 19)J

(C) (8 / 3) J

(D) (19 / 5)J

Question 9.

300 J of work is done in sliding a 2 kg block up an inclined plane of height 10 m. Taking g = 10 m/s^2, work done against friction is

[4 Marks]

(A) 100 J

(B) zero

(C) 200 J

(D) 1000 J

Question 10.

A tube of length L is filled completely with an incompressible liquid of mass M and closed at both the ends. The tube is then rotated in a horizontal plane about one of its ends with a uniform angular velocity. The force exerted by the liquid at the other end is

[4 Marks]

(A) $ML^2\omega / 2$

(B) $ML\omega^2$

(C) $ML^2\omega^2 / 2$

(D) $ML\omega^2 / 2$

Question 11.

The moment of inertia of a uniform circular disc of radius R and mass M about an axis touching the disc at its diameter and normal to the disc is

[4 Marks]

(A) $(2 / 5)MR^2$

(B) $(3 / 2)MR^2$

(C) $(1 / 2)MR^2$

(D) MR^2

Question 12.

The Earth is assumed to be a sphere of radius R. A platform is arranged at a height R from the surface of the Earth. The escape velocity of a body from this platform is fv, where v is its escape velocity from the surface of the Earth. The value of f is

[4 Marks]

(A) 1 / 3

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

(C) 1 / 2

(D) $\sqrt{2}$

Question 13.

A black body at 1227°C emits radiations with maximum intensity at a wavelength of 5000Å. If the temperature of the body is increased by 1000°C, the maximum intensity will be observed at

[4 Marks]

(A) 5000Å

(B) 6000Å

(C) 4000Å

(D) 3000Å

Question 14.

A Carnot engine whose sink is at 300 K has an efficiency of 40%. By how much should the temperature of source be increased so as to increase the efficiency by 50% of original efficiency?

[4 Marks]

(A) 325 K

(B) 250 K

(C) 380 K

(D) 275 K

Question 15.

When volume of system is increased twice and temperature is decreased half of its initial temperature, then pressure becomes

[4 Marks]

(A) 2 times

(B) 4 times

(C) 1 / 2 times

(D) 1 / 4 times

Question 16.

The molar specific heat at constant pressure of an ideal gas is (7 / 2) R. The ratio of specific heat at constant pressure to that at constant volume is

[4 Marks]

(A) 8 / 7

(B) 7 / 5

(C) 9 / 7

(D) 5 / 7

Question 17.

The potential energy of a long spring when stretched by 2 cm is U. If the spring is stretched by 8 cm, the potential energy stored in it is

[4 Marks]

(A) 4 U

(B) 16 U

(C) U / 4

(D) 8 U

Question 18.

A rectangular block of mass m and area of cross-section A floats in a liquid of density ρ. If it is given a small vertical displacement from equilibrium it undergoes oscillation with a time period T. Then-

[4 Marks]

(A) $T \propto \sqrt{\rho}$

(B) $T \propto 1/\rho$

(C) $T \propto 1/\sqrt{A}$

(D) $T \propto 1/\sqrt{m}$

Question 19.

Which one of the following statements is true ?

[4 Marks]

(A) The sound waves in air are longitudinal while the light waves are transverse

(B) Both light and sound waves in air are transverse

(C) Both light and sound waves in air are longitudinal

(D) Both light and sound waves can travel in vacuum

Question 20.

A transverse wave propagating along x-axis is represented by $y(x,t) = 8.0 \sin(0.5\pi x - 4\pi t - \pi/4)$ where x is in metres and t is in seconds. The speed of the wave is

[4 Marks]

(A) 4π m/s

(B) 8 m/s

(C) $0.5\ \pi$ m/s

(D) $(\pi / 4)$ m/s

Question 21.

The time of reverberation of a room A is one second. What will be the time (in seconds) of reverberation of a room, having dimensions double of those of room A?

[4 Marks]

(A) 4

(B) 1 / 2

(C) 1

(D) 2

Question 22.

Two sound waves with wavelengths 5.0 m and 5.5 m respectively, each propagate in a gas with velocity 330 m/s. We expect the following number of beats per second

[4 Marks]

(A) 0

(B) 1

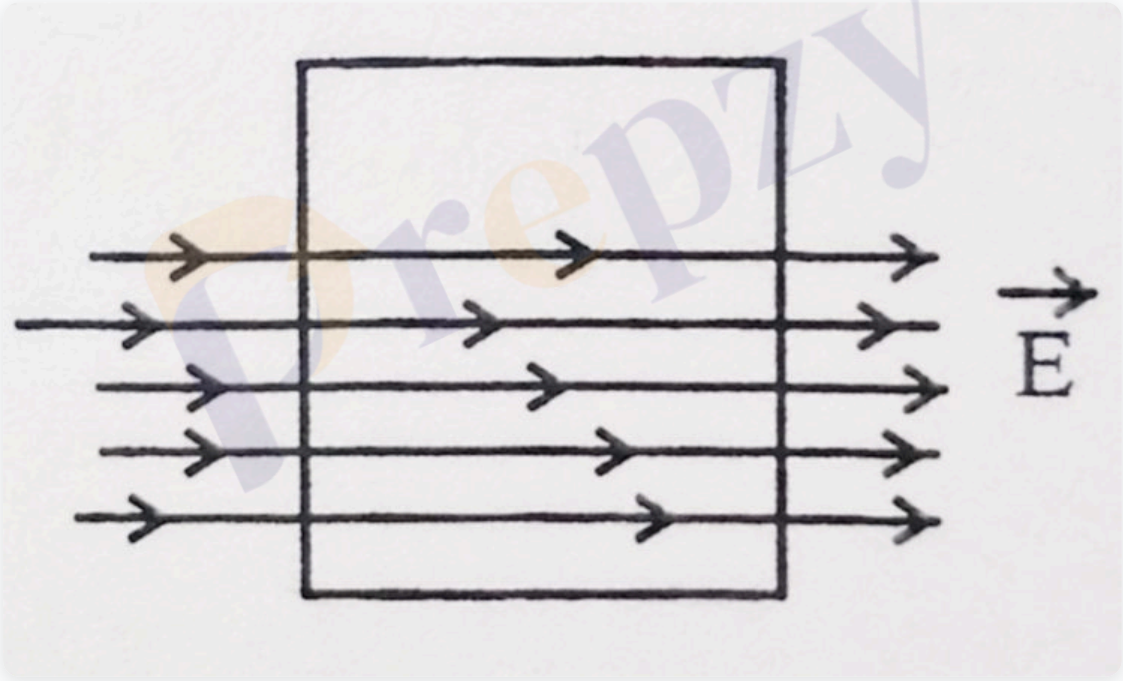
(C) 6

(D) 12

Question 23.

A square surface of side L metres is in the plane of the paper. A uniform electric field $\vec{E}$ (volt /m), also in the plane of the paper, is limited only to the lower half of the square surface (see figure). The electric flux in SI units associated with the surface is

[4 Marks]



(A) $EL^2 / 2$

(B) zero

(C) EL^2

(D) $EL^2 / (2\varepsilon_0)$

Question 24.

A parallel plate air capacitor is charged to a potential difference of V volts. After disconnecting the charging battery the distance between the plates of the capacitor is increased using an insulating handle. As a result the potential difference between the plates

[4 Marks]

(A) does not change

(B) becomes zero

(C) increases

(D) decreases

Question 25.

In producing chlorine through electrolysis, 100 watt power at 125 V is being consumed. How much chlorine per minute is liberated? E.C.E. of chlorine is 0.367×10^{-6} kg coulomb.

[4 Marks]

(A) 17.6 mg

(B) 13.6 mg

(C) 24.3 mg

(D) 21.3 mg

Question 26.

Kirchhoff's first and second laws for electrical circuits are consequences of

[4 Marks]

(A) conservation of electric charge and energy respectively

(B) conservation of electric charge

(C) conservation of energy

(D) conservation of energy and electric charge respectively

Question 27.

Two cells, having the same e.m.f., are connected in series through an external resistance R. Cells have internal resistances r_1 and r_2 ($r_1 > r_2$) respectively. When the circuit is closed, the potential difference across the first cell is zero. The value of R is

[4 Marks]

(A) $(r_1 + r_2) / 2$

(B) $r_1 + r_2$

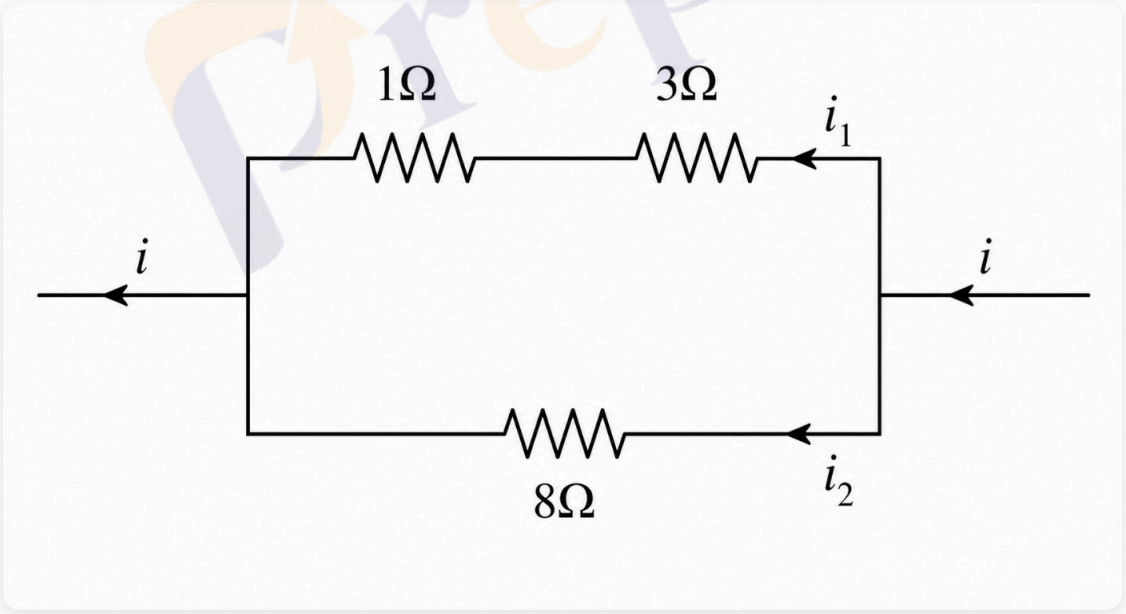
(C) $r_1 - r_2$

(D) $(r_1 - r_2) / 2$

Question 28.

Power dissipated across the 8Ω resistor in the circuit shown here is 2 watt. The power dissipated in watt units across the 3Ω resistor is

[4 Marks]



(A) 1.0

(B) 3.0

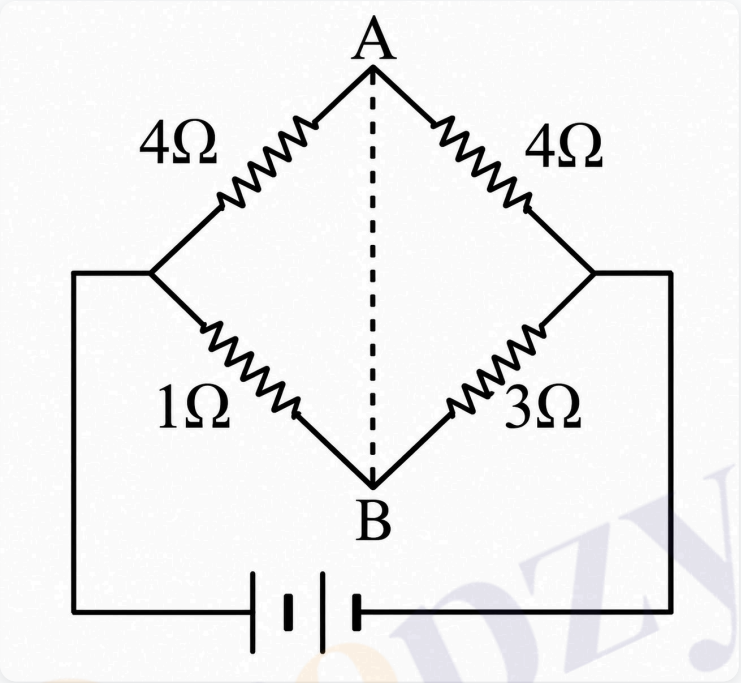
(C) 0.5

(D) 2.0

Question 29.

In the circuit shown, if a conducting wire is connected between points A and B, the current in this wire will

[4 Marks]



(A) flow in the direction which will be decided by the value of V

(B) be zero

(C) flow from B to A

(D) flow from A to B

Question 30.

Two circular coils 1 and 2 are made from the same wire but the radius of the 1^{st} coil is twice that of the 2^{nd} coil. What potential difference in volts should be applied across them so that the magnetic field at their centres is the same?

[4 Marks]

(A) 3

(B) 2

(C) 6

(D) 4

Question 31.

When a charged particle moving with velocity ?⃗ is subjected to a magnetic field of induction ?⃗, the force on it is non-zero. This implies that

[4 Marks]

(A) angle between ?⃗ and ?⃗ can have any value other than zero and 180°

(B) angle between ?⃗ and ?⃗ can have any value other than 90°

(C) angle between ?⃗ and ?⃗ is either zero or 180°

(D) angle between ?⃗ and ?⃗ is necessarily 90°

Question 32.

Curie temperature is the temperature above which

[4 Marks]

(A) ferromagnetic material becomes diamagnetic material

(B) paramagnetic material becomes ferromagnetic material

(C) paramagnetic material becomes diamagnetic material

(D) ferromagnetic material becomes paramagnetic material

Question 33.

Two coils of self inductances 2 mH and 8 mH are placed so closely together that the effective flux in one coil is completely linked with the other. The mutual inductance between them is

[4 Marks]

(A) 6 mH

(B) 4 mH

(C) 16 mH

(D) 10 mH

Question 34.

A coil of inductance 31 Ω has a resistance of 8 Ω. It is placed in series with a condenser of capacitative reactance 25 Ω. The combination is connected to an a.c. source of 110 volt.

The power factor of the circuit is

[4 Marks]

(A) 0.64

(B) 0.80

(C) 0.33

(D) 0.56

Question 35.

The core of a transformer is laminated because

[4 Marks]

(A) the weight of the transformer may be reduced

(B) rusting of the core may be prevented

(C) energy losses due to eddy currents may be minimised

(D) ratio of voltage in primary and secondary may be increased

Question 36.

A transistor-oscillator using a resonant circuit with an inductor L (of negligible resistance) and a capacitor C in series produces oscillating frequency f. If L is doubled and C is changed to 4C, the frequency will be

[4 Marks]

(A) f /2

(B) f / $2\sqrt{2}$

(C) f / 4

(D) 8 f

Question 37.

A convex lens and a concave lens, each having same focal length of 25 cm, are put in contact to form a combination of lenses. The power in diopters of the combination is

[4 Marks]

(A) infinite

(B) 50

(C) zero

(D) 25

Question 38.

A microscopic focused on a mark in a piece of paper and then a slab of glass of thickness 3 cm and refractive index 1.5 is placed over the mark. How should the microscope be moved to get the mark in focus again?

[4 Marks]

(A) 1 cm upward

(B) 2 cm upward

(C) 1 cm downward

(D) 4.5 cm downward

Question 39.

In a discharge tube ionization of enclosed gas is produced due to collisions between

[4 Marks]

(A) photons and neutral atoms / molecules

(B) positive ions and neutral atoms / molecules

(C) neutral gas atoms / molecules

(D) negative electrons and neutral atoms /molecules

Question 40.

When photons of energy hν fall on an aluminium plate (of work function E_0), photoelectrons of maximum kinetic energy K are ejected. If the frequency of the radiation is doubled, the maximum kinetic energy of the ejected photoelectrons will be

[4 Marks]

(A) K

(B) 2K

(C) $K + E_0$

(D) $K + h\nu$

Question 41.

A photo-cell employs photoelectric effect to convert

[4 Marks]

(A) change in the intensity of illumination into a change in photoelectric current

(B) change in the intensity of illumination into a change in the work function of the photocathode

(C) change in the frequency of light into a change in the electric current

(D) change in the frequency of light into a change in the electric voltage

Question 42.

The momentum of a photon of energy 1 MeV in kg m/s, will be

[4 Marks]

(A) 7×10^{-24}

(B) 5×10^{-22}

(C) 10^{-22}

(D) 0.33×10^{6}

Question 43.

Ionization potential of hydrogen atom is 13.6 eV. Hydrogen atoms in the ground state are excited by monochromatic radiation of photon energy 12.1 eV. According to Bohr's theory, the spectral lines emitted by hydrogen will be

[4 Marks]

(A) Three

(B) Four

(C) One

(D) Two

Question 44.

The radius of germanium (Ge) nuclei is measured to be twice the radius of $^{9}_{4}Be$. The number of nucleons in Ge are

[4 Marks]

(A) 74

(B) 75

(C) 72

(D) 73

Question 45.

The binding energy of deuteron is 2.2 MeV and that of $^{4}_{2}He$ is 28 MeV. If two deuterons are fused to form one $^{4}_{2}He$, the energy released is

[4 Marks]

(A) 19.2 MeV

(B) 23.6 MeV

(C) 30.2 MeV

(D) 25.8 MeV

Question 46.

In a radioactive material the activity at time t_1 is R_1 and at a later time t_2, it is R_2. If the decay constant of the material is λ, then

[4 Marks]

(A) $R_1 = R_2e_(-\lambda(t_1-t_2))$

(B) $R_1 = R_2e_(t_2/t_1)$

(C) $R_1 = R_2e_\lambda(t_1-t_2)$

(D) $R_1 = R_2$

Question 47.

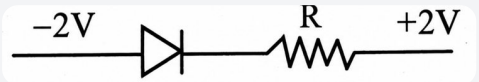
Which one of the following represents forward bias diode?

[4 Marks]

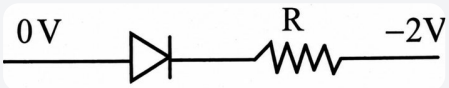
(A)



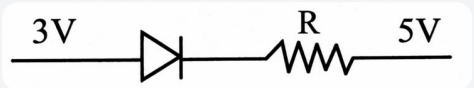
(B)



(C)



(D)



Question 48.

A transistor is operated in common emitter configuration at constant collector voltage V_c =1.5V such that a change in the base current from 100 μA to 150 μA produces a change in the collector current from 5 mA to 10 mA. The

current gain (β) is

[4 Marks]

(A) 75

(B) 100

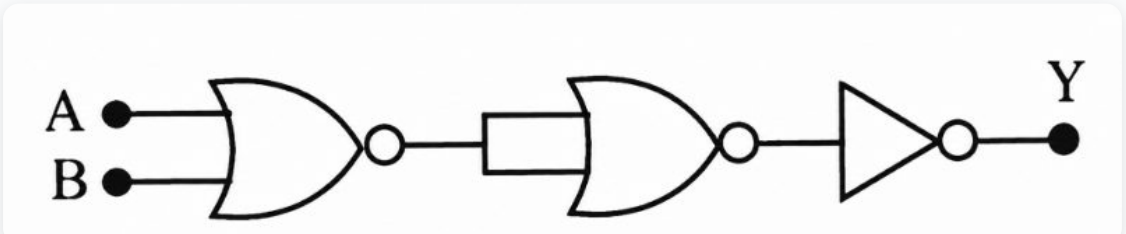
(C) 67

(D) 50

Question 49.

The given electrical network is equivalent to :

[4 Marks]



(A) OR gate

(B) NOR gate

(C) AND gate

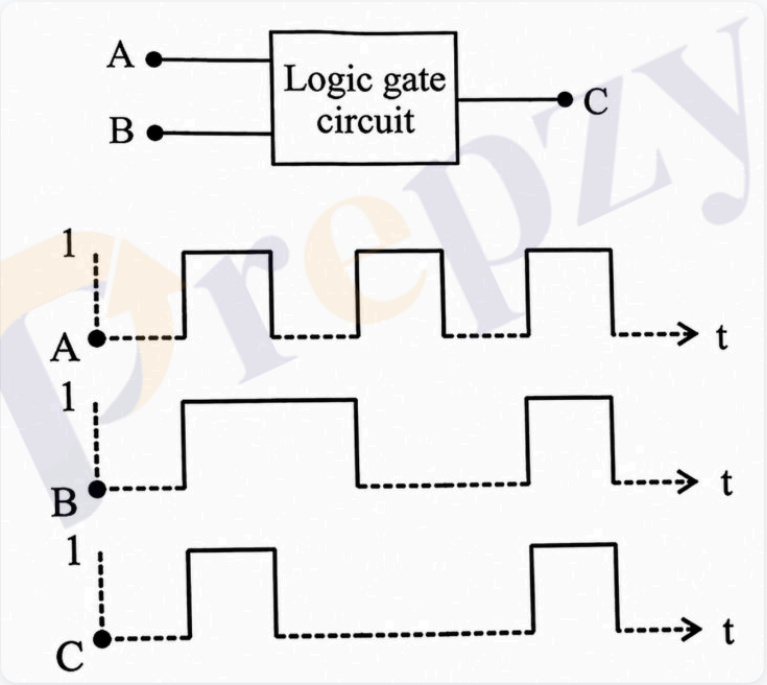
(D) NOT gate

Question 50.

The following figure shows a logic gate circuit with two inputs A and B and the output C. The voltage waveforms of A , B and C are as shown below

The logic circuit gate is

[4 Marks]



(A) OR gate

(B) AND gate

(C) NOR gate

(D) NAND gate

Question 51.

Given : The mass of electron is 9.11×10^{-31} kg Planck's constant is 6.626×10^{-34} Js, the uncertainty involved in the measurement of velocity within a distance of 0.1 Å is

[4 Marks]

(A) $5.79 \times 10^6\ ms^{-1}$

(B) $5.79 \times 10^5\ ms^{-1}$

(C) $5.79 \times 10^8\ ms^{-1}$

(D) $5.79 \times 10^7\ ms^{-1}$

Question 52.

The orientation of an atomic orbital is governed by

[4 Marks]

(A) Magnetic quantum number

(B) Spin quantum number

(C) Principal quantum number

(D) Azimuthal quantum number

Question 53.

Which of the following is not a correct statement?

[4 Marks]

(A) The canonical structures have no real existence

(B) Every AB_5 molecule does in fact have square pyramidal structure

(C) Multiple bonds are always shorter than corresponding single bonds

(D) The electron-deficient molecules can act as Lewis acids

Question 54.

The electronegativity difference between N and F is greater than that between N and H yet the dipole moment of NH_3 (1.5 D) is larger than that of NF_3 (0.2 D). This is because

[4 Marks]

(A) in NH_3 as well as in NF_3 the atomic dipole and bond dipole are in the same directions

(B) in NH_3 as well as NF_3 the atomic dipole and bond dipole are in opposite directions

(C) in NH_3 the atomic dipole and bond dipole are in the opposite directions whereas in NF_3 these are in the same direction

(D) in NH_3 the atomic dipole and bond dipole are in the same directions whereas in NF_3 these are in opposite directions

Question 55.

Which of the following is not isostructural with $SiCl_4$?

[4 Marks]

(A) SO_4^{2-}

(B) PO_4^{3-}

(C) SCl_4

(D) NH_4^+

Question 56.

Which of the following species has a linear shape?

[4 Marks]

(A) SO_2

(B) NO_2^+

(C) O_3

(D) NO_2^-

Question 57.

In which of the following molecules all the bonds are not equal?

[4 Marks]

(A) BF_3

(B) AlF_3

(C) NF_3

(D) ClF_3

Question 58.

The number of unpaired electrons in a paramagnetic diatomic molecule of an element with atomic number 16

is

[4 Marks]

(A) 3

(B) 4

(C) 1

(D) 2

Question 59.

Assume each reaction is carried out in an open container. For which reaction will $\Delta H = \Delta E$?

[4 Marks]

(A) $C(s) + 2H_2O(g) \rightarrow 2H_2(g) + CO_2(g)$

(B) $PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$

(C) $H_2(g) + Br_2(g) \rightarrow 2HBr(g)$

(D) $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$

Question 60.

The enthalpy of hydrogenation of cyclohexene is -119.5 kJ mol^{-1}. If resonance energy of benzene is -150.4 kJ mol^{-1}, its enthalpy of hydrogenation would be

[4 Marks]

(A) -269.9 kJ mol^{-1}

(B) -508.9 kJ mol^{-1}

(C) -358.5 kJ mol^{-1}

(D) -208.1 kJ mol^{-1}

Question 61.

The enthalpy and entropy change for the reaction

$Br_2(l) + Cl_2(g) \rightarrow 2BrCl(g)$

are 30 kJ mol^{-1} and 105 JK^{-1} mol^{-1} respectively. The temperature at which the reaction will be in equilibrium is

[4 Marks]

(A) 273 K

(B) 285.7 K

(C) 300 K

(D) 450 K

Question 62.

Identify the correct statement for change of Gibbs energy for a system (ΔG_system) at constant temperature and pressure :

[4 Marks]

(A) If $\Delta G_system = 0$, the system has attained equilibrium

(B) If $\Delta G_system = 0$, the system is still moving in a particular direction

(C) If $\Delta G_system < 0$, the process is not spontaneous

(D) If $\Delta G_system > 0$, the process is spontaneous

Question 63.

For the reaction

$CH_4(g) + 2O_2(g) \rightleftharpoons CO_2(g) + 2H_2O(l)$, $\Delta rH = -170.8$ kJ mol^{-1}
Which of the following statements is not true ?

[4 Marks]

(A) The equilibrium constant for the reaction is given by $K_p = [CO_2] / [CH_4][O_2]^2$

(B) Addition of $CH_4(g)$ or $O_2(g)$ at equilibrium will cause a shift to the right

(C) The reaction is exothermic

(D) At equilibrium, the concentrations of $CO_2(g)$ and $H_2O(l)$ are not equal

Question 64.

The hydrogen ion concentration of a 10^{-8} M HCl aqueous solution at 298 K ($K_w = 10^{-14}$) is

[4 Marks]

(A) 11×10^{-8} M

(B) 9.525×10^{-8} M

(C) 1.0×10^{-6} M

(D) 1.0×10^{-8} M

Question 65.

Which of the following pairs constitutes a buffer?

[4 Marks]

(A) NaOH and NaCl

(B) HNO_3 and NH_4NO_3

(C) HCl and KCl

(D) HNO_2 and $NaNO_2$

Question 66.

The sequence of ionic mobility in aqueous solution is :

[4 Marks]

(A) $K^+ > Na^+ > Rb^+ > Cs^+$

(B) $Cs^+ > Rb^+ > K^+ > Na^+$

(C) $Rb^+ > K^+ > Cs^+ > Na^+$

(D) $Na^+ > K^+ > Rb^+ > Cs^+$

Question 67.

Al_2O_3 can be converted to anhydrous $AlCl_3$ by heating

[4 Marks]

(A) Al_2O_3 with HCl gas

(B) Al_2O_3 with Cl_2 gas

(C) Al_2O_3 with NaCl in solid state

(D) a mixture of Al_2O_3 and carbon in dry Cl_2 gas

Question 68.

The general molecular formula, which represents the homologous series of alkanols is

[4 Marks]

(A) $C_nH_{2n}O_2$

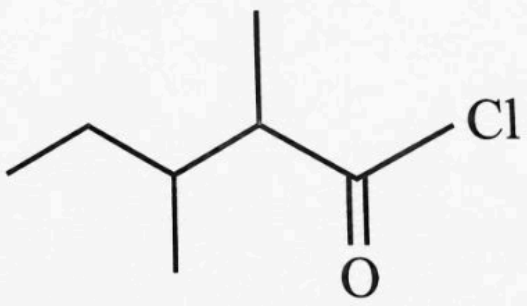
(B) $C_nH_{2n+1}O$

(C) $C_nH_{2n+2}O$

(D) $C_nH_{2n}O$

Question 69.

[4 Marks]

The IUPAC name of  is

(A) 1-chloro -1-0xo - 2, 3- dimethyl pentane

(B) 2-ethyl -3- methylbutanoyl chloride

(C) 2, 3-dimethylpentanoyl chloride

(D) 3, 4-dimethyl pentanoyl chloride

Question 70.

The correct order regarding the electrone-gativity of hybrid orbitals of carbon is

[4 Marks]

(A) $sp > sp^2 > sp^3$

(B) $sp < sp^2 > sp^3$

(C) $sp > sp^2 < sp^3$

(D) $sp < sp^2 < sp^3$

Question 71.

CsBr crystallises in a body centred cubic lattice. The unit cell length is 436.6 pm. Given that the atomic mass of Cs = 133 and that of Br = 80 amu and Avogadro number being 6.02×10^{23} mol^{-1}, the density of CsBr is

[4 Marks]

(A) 0.425 g/cm^3

(B) 8.25 g/cm^3

(C) 4.25 g/cm^3

(D) 42.5 g/cm^3

Question 72.

The appearance of colour in solid alkali metal halides is generally due to

[4 Marks]

(A) Schottky defect

(B) F-centres

(C) Interstitial positions

(D) Frenkel defect

Question 73.

A solution of acetone in ethanol

[4 Marks]

(A) obeys Raoult's law

(B) behaves like a non ideal solution

(C) shows a negative deviation from Raoult's law

(D) shows a positive deviation from Raoult's law

Question 74.

The thalloid body of a slime mould (Myxomycetes) is known as

[4 Marks]

(A) plasmodium

(B) fruiting body

(C) mycelium

(D) protonema

Question 75.

What is common about Trypanosoma, Noctiluca, Monocystis and Giardia?

[4 Marks]

(A) These are all parasites

(B) These are all unicellular protists

(C) They produce spores

(D) They have flagella

Question 76.

Which of the following environmental conditions are essential for optimum growth of Mucor on a piece of bread?
(i) Temperature of about 25°C
(ii) Temperature of about 5°C

(iii) Relative humidity of about 5%

(iv) Relative humidity of about 95%

(v) A shady place

(vi) A brightly illuminated place

Choose the answer from the following options:

[4 Marks]

(A) (i), (iii) and (v) only

(B) (ii), (iii) and (vi) only

(C) (i), (iv) and (v) only

(D) (ii), (iv) and (v) only

Question 77.

The causative agent of mad-cow disease is a

[4 Marks]

(A) Worm

(B) Prion

(C) Bacterium

(D) Virus

Question 78.

Peat Moss is used as a packing material for sending flowers and live plants to distant places because

[4 Marks]

(A) it is hygroscopic

(B) It reduces transpiration

(C) it serves as a disinfectant

(D) it is easily available

Question 79.

Conifers differ from grasses in the

[4 Marks]

(A) production of seeds from ovules

(B) formation of endosperm before fertilisation

(C) absence of pollen tubes

(D) lack of xylem tracheids

Question 80.

Two common characters found in centipede, cockroach and crab are

[4 Marks]

(A) Green gland and tracheae

(B) Jointed legs and chitinous exoskeleton

(C) Book lungs and antennae

(D) Compound eyes and anal cerci

Question 81.

Biradial symmetry and lack of cnidoblasts are the characteristics of

[4 Marks]

(A) Ctenoplana and Beroe

(B) Aurelia and Paramecium

(C) Hydra and starfish

(D) Starfish and sea anemone

Question 82.

Metameric segmentation is the characteristic of

[4 Marks]

(A) Echinodermata and Annelida

(B) Annelida and Arthropoda

(C) Mollusca and Chordata

(D) Platyhelminthes and Arthropoda

Question 83.

Which one of the following is a matching set of a phylum and its three examples?

[4 Marks]

(A) Mollusca – Loligo, Teredo, Octopus

(B) Platyhelminthes – Planaria, Schistosoma, Enterobius

(C) Cnidaria – Bonellia, Physalia, Aurelia

(D) Porifera – Spongilla, Euplectella, Pennatula

Question 84.

In which one of the following sets of animals do all the four give birth to young ones?

[4 Marks]

(A) Shrew, Bat, Cat, Kiwi

(B) Platypus, Penguin, Bat, Hippopotamus

(C) Lion, Bat, Whale, Ostrich

(D) Kangaroo, Hedgehog, Dolphin, Loris

Question 85.

Annual migration does not occur in the case of

[4 Marks]

(A) Siberian crane

(B) Salamander

(C) Salmon

(D) Arctic tern

Question 86.

What type of placentation is seen in sweet pea?

[4 Marks]

(A) Axile

(B) Free central

(C) Marginal

(D) Basal

Question 87.

Long filamentous threads protruding at the end of the young cob of maize are

[4 Marks]

(A) styles

(B) ovaries

(C) anthers

(D) hairs

Question 88.

In a cereal grain the single cotyledon of embryo is represented by

[4 Marks]

(A) scutellum

(B) prophyll

(C) coleoptile

(D) coleorhiza

Question 89.

Pineapple fruit develops from

[4 Marks]

(A) a cluster of compactly borne flowers on a common axis

(B) a multistipitate syncarpous flower on a common axis

(C) a unilocular polycarpellary flower

(D) a multilocular monocarpellary flower

Question 90.

Aril represents the edible part of

[4 Marks]

(A) litchi

(B) banana

(C) mango

(D) apple

Question 91.

A common structural feature of vessel elements and sieve tube elements are

[4 Marks]

(A) presence of P-protein

(B) pores on lateral walls

(C) thick secondary wall

(D) enucleate condition

Question 92.

Areolar connective tissue joins

[4 Marks]

(A) integument with muscles

(B) bones with muscles

(C) fat body with muscles

(D) bones with bones

Question 93.

Mast cells secrete

[4 Marks]

(A) myoglobin

(B) hippurin

(C) hemoglobin

(D) histamine

Question 94.

A major break through in the studies of cells came with the development of electron microscope. This is because

[4 Marks]

(A) the resolving power of the electron microscope is 200–350 nm as compared to 0.1–0.2 for the light microscope

(B) electron beam can pass through thick materials, whereas light microscope requires thin sections

(C) the electron microscope is more powerful than the light microscope as it uses a beam of electrons which has wavelength much longer than that of photons

(D) the resolution power of the electron microscope is much higher than that of the light microscope

Question 95.

Which of the following statements regarding cilia is not correct?

[4 Marks]

(A) Microtubules of cilia are composed of tubulin.

(B) Cilia are hair-like cellular appendages.

(C) Cilia contain an outer ring of nine doublet microtubules surrounding two single microtubules.

(D) The organized beating of cilia is controlled by fluxes of Ca^{2+} across the membrane.

Question 96.

Which of the following statement regarding mitochondrial membrane is not correct?

[4 Marks]

(A) The enzymes of the electron transfer chain are embedded in the outer membrane.

(B) The inner membrane is highly convoluted forming a series of infoldings.

(C) The outer membrane resembles a sieve.

(D) The outer membrane is permeable to all kinds of molecules.

Question 97.

β-form DNA is approximately

[4 Marks]

(A) 3.4 nm

(B) 2 nm

(C) 0.34 nm

(D) 20 nm

Question 98.

An organic substance bound to an enzyme and essential for its activity is called

[4 Marks]

(A) Isoenzyme

(B) Holoenzyme

(C) Apoenzyme

(D) Coenzyme

Question 99.

What would be the number of chromosomes in the cells of the aleurone layer in a plant species with 8 chromosomes in its synergies?

[4 Marks]

(A) 16

(B) 24

(C) 8

(D) 32

Question 100.

The translocation of organic solutes in sieve tube members is supported by

[4 Marks]

(A) cytoplasmic streaming

(B) root pressure and transpiration pull

(C) mass flow involving a carrier and ATP

(D) P-proteins

Question 101.

Farmers in a particular region were concerned that premature yellowing of leaves of a pulse crop might cause decrease in the yield. Which treatment could be most beneficial to obtain maximum seed yield?

[4 Marks]

(A) Frequent irrigation of the crop

(B) Application of iron and magnesium to promote synthesis of chlorophyll

(C) Treatment of the plants with cytokinins along with a small dose of nitrogenous fertilizer

(D) Removal of all yellow leaves and spraying a remaining green leaves with 2,4,5-trichlorophenoxy acetic acid

Question 102.

In photosystem-I the first electron acceptor is

[4 Marks]

(A) Cytochrome

(B) Plastocyanin

(C) Ferredoxin

(D) An iron-sulphur protein

Question 103.

During photorespiration, the oxygen consuming reaction(s) occur in

[4 Marks]

(A) stroma of chloroplast and peroxisomes

(B) stroma of chloroplasts and mitochondria

(C) grana of chloroplasts and peroxisomes

(D) stroma of chloroplasts

Question 104.

The bacterium Clostridium botulinum that causes botulism is

[4 Marks]

(A) an obligate anaerobe

(B) an obligate aerobe

(C) a facultative aerobe

(D) a facultative anaerobe

Question 105.

How many ATP molecules could maximally be generated from one molecule of glucose, if the complete oxidation of one mole of glucose to CO_2 and H_2O yields 686 kcal and the useful chemical energy available in the high energy phosphate bond of one mole of ATP is 12 kcal?

[4 Marks]

(A) Fifty-seven

(B) Two

(C) Thirty

(D) One

Question 106.

An enzyme that can stimulate germination of barley seeds is

[4 Marks]

(A) lipase

(B) protease

(C) invertase

(D) a-amylase

Question 107.

How does pruning help in making the hedge dense?

[4 Marks]

(A) It releases wound hormones

(B) It induces the differentiation of new shoots from the rootstock

(C) It frees axillary buds from apical dominance

(D) The apical shoot grows faster after pruning

Question 108.

Treatment of seed at low temperature under moist condition to break its dormancy is called

[4 Marks]

(A) chelation

(B) vernalization

(C) stratification

(D) scarification

Question 109.

Which one of the following statements is incorrect?

[4 Marks]

(A) The residual area in lungs slightly decreases the efficiency of respiration in mammals.

(B) The presence of non-respiratory air sacs increases the efficiency of respiration in birds.

(C) The principle of countercurrent flow facilitates efficient respiration in gills of fishes.

(D) In insects, circulating body fluids serve to distribute oxygen to tissues.

Question 110.

The majority of carbon dioxide produced by our body cells is transported to the lungs

[4 Marks]

(A) as bicarbonates

(B) as carbonates

(C) dissolved in the blood

(D) attached to haemoglobin

Question 111.

Which of the following has an open circulatory system?

[4 Marks]

(A) Periplaneta

(B) Hirudinaria

(C) Octopus

(D) Pheretima

Question 112.

Examination of blood of a person suspected of having anaemia, shows large, immature, nucleated erythrocytes without haemoglobin. Supplementing his diet with which of the following is likely to alleviate his symptoms?

[4 Marks]

(A) Thiamine

(B) Folic acid and cobalamine

(C) Lipids

(D) Riboflavin

Question 113.

Match List I with List II.
Choose the correct answer from the options given below:

[4 Marks]

List I	List II
A. Taenia	I. Nephridia
B. Paramoecium	II. Contractile vacuole
C. Periplaneta	III. Flame cells
D. Pheretima	IV. Urecose gland

(A) A–III, B–II, C–IV, D–I

(B) A–II, B–I, C–IV, D–III

(C) A–I, B–II, C–III, D–IV

(D) A–I, B–II, C–IV, D–III

Question 114.

Which one of the following options gives the correct categorization of six animals according to the type of nitrogenous wastes (A, B, C) they give out?

[4 Marks]

	I	II	III
	A-Ammonotelle	B-Ureotelic	C-Uricotelle
(a)	Pigeon, Humans	Aquatic Amphibia, Lizards	Cockroach, Frog
(b)	Frog, Lizards	Aquatic Amphibia, Humans	Cockroach, Pigeon
(c)	Aquatic Amphibia	Frog, Humans	Pigeon, Lizards, Cockroach
(d)	Aquatic Amphibia	Cockroach, Humans	Frog, Pigeon, Lizards

(A) a

(B) b

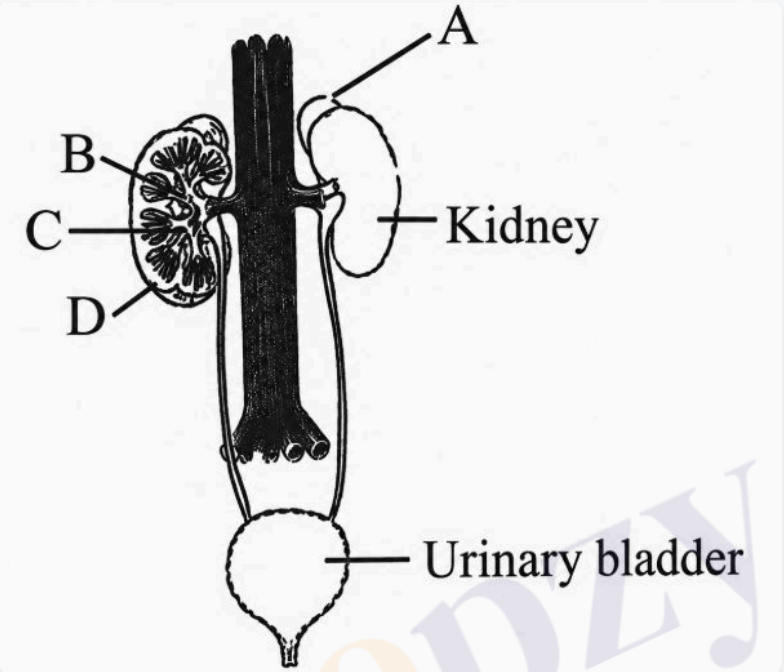
(C) d

(D) c

Question 115.

Figure shown human urinary system with structures labelled A to D. Select option which correctly identifies them and gives their functions.

[4 Marks]



(A) C-Medulla: inner zone of kidney and contains complex nephrons.

(B) B-pelvis: broad funnel shaped space inner to hilum, directly connected to loops of Henle.

(C) D-Cortex: outer part of kidney and do not contain any part of nephrons.

(D) A-Adrenal gland: located at the anterior part of kidney. Secrete Catecholamines which stimulate glycogen breakdown.

Question 116.

Angiotensin is a protein produced and secreted by

[4 Marks]

(A) liver cells

(B) endothelial cells (lining the blood vessels)

(C) macula densa cells

(D) juxtaglomerular (JG) cells

Question 117.

Which of the following is the contractile protein of a muscle?

[4 Marks]

(A) Tropomyosin

(B) Myosin

(C) Actin

(D) Tubulin

Question 118.

Bowman's capsule found in

[4 Marks]

(A) external auditory canal

(B) cortical nephrons only

(C) juxtamedullary nephrons

(D) olfactory epithelium

Question 119.

Which one of the following statement is correct?

[4 Marks]

(A) Neither hormones control neural activity nor the neurons control endocrine activity

(B) Endocrine glands regulate endocrine activity, and nervous system regulates endocrine glands

(C) Endocrine glands regulate neural activity, but not vice versa

(D) Neurons regulate endocrine activity, but not vice versa

Question 120.

Sertoli cells are regulated by the pituitary hormone known as

[4 Marks]

(A) Prolactin

(B) GH

(C) LH

(D) FSH

Question 121.

Which of the following is an accumulation and release centre of neurohormones?

[4 Marks]

(A) Intermediate lobe of the pituitary

(B) Hypothalamus

(C) Anterior pituitary lobe

(D) Posterior pituitary lobe

Question 122.

Which hormone causes dilation of blood vessels, increased oxygen consumption and glucogenesis?

[4 Marks]

(A) Adrenaline

(B) Insulin

(C) Glucagon

(D) ACTH

Question 123.

A steroid hormone which regulates glucose metabolism is

[4 Marks]

(A) Cortisone

(B) 11-deoxycorticosterone

(C) Cortisone

(D) Cortisol

Question 124.

Which one of the following is not a second messenger in hormone action?

[4 Marks]

(A) Calcium

(B) Sodium

(C) cGMP

(D) cAMP

Question 125.

Which one of the following does not act as a neurotransmitter?

[4 Marks]

(A) Norepinephrine

(B) Epinephrine

(C) Cortisone

(D) Acetylcholine

Question 126.

The arrangement of the nuclei in a normal embryo sac in the dicot plants is

[4 Marks]

(A) 3 + 2 + 3

(B) 3 + 3 + 2

(C) 2 + 4 + 2

(D) 2 + 3 + 3

Question 127.

What would be the number of chromosomes in the cells of the aleuron layer in a plant species with 8 chromosomes in its synergids?

[4 Marks]

(A) 24

(B) 32

(C) 8

(D) 16

Question 128.

Withdrawal of which of the following hormones is the immediate cause of menstruation?

[4 Marks]

(A) FSH

(B) FSH-RH

(C) Estrogen

(D) Progesterone

Question 129.

Which one of the following is an example of polygenic inheritance?

[4 Marks]

(A) Skin colour in humans

(B) Pod shape in garden pea

(C) Production of male honey bee

(D) Flower colour in Mirabilis jalapa

Question 130.

In Mendel's experiment with garden pea, round seed shape (RR) was dominant over wrinkled seeds (rr), yellow cotyledon (YY) was dominant over green cotyledon (yy). What are the expected phenotypes in the F_2 generation of the cross RRYY × rryy?

[4 Marks]

(A) only wrinkled seeds with yellow cotyledons

(B) only wrinkled seeds with green cotyledons

(C) only round seeds with green cotyledons

(D) Round seeds with yellow cotyledons, and wrinkled seeds with yellow cotyledons

Question 131.

Test cross involves

[4 Marks]

(A) crossing between two F_1 hybrids

(B) crossing the F_1 hybrid with a double recessive genotype

(C) crossing between two genotypes with dominant trait

(D) crossing between two genotypes with recessive trait

Question 132.

Phenotype of an organism is the result of

[4 Marks]

(A) cytoplasmic effects and nutrition

(B) environmental changes and sexual dimorphism

(C) genotype and environment interactions

(D) mutations and linkages

Question 133.

How many different kinds of gametes will be produced by a plant having the genotype AABbCC?

[4 Marks]

(A) Nine

(B) Four

(C) Two

(D) Three

Question 134.

In which mode of inheritance do you expect more maternal influence among the offspring?

[4 Marks]

(A) Cytoplasmic

(B) Autosomal

(C) Y-linked

(D) X-linked

Question 135.

If a colour blind woman marries a normal visioned man, their children will be

[4 Marks]

(A) one-half colour blind and one-half normal

(B) three-fourths colour blind and one-fourth normal

(C) all colour blind

(D) all normal visioned

Question 136.

Cri-du-chat syndrome in humans is caused by the

[4 Marks]

(A) loss of half of the long arm of chromosome 5

(B) loss of half of the short arm of chromosome 5

(C) trisomy of 21st chromosome

(D) fertilization of an XX egg by a normal Y-bearing sperm

Question 137.

Both sickle cell anaemia and Huntington's chorea are

[4 Marks]

(A) bacteria-related diseases

(B) virus-related diseases

(C) pollutant-induced disorders

(D) congenital disorders

Question 138.

Sickle cell anaemia has not been eliminated from the African population because

[4 Marks]

(A) it is controlled by recessive genes

(B) it is controlled by dominant genes

(C) it provides immunity against malaria

(D) it is not a fatal disease

Question 139.

Which antibiotic inhibits interaction between tRNA and mRNA during bacterial protein synthesis?

[4 Marks]

(A) Neomycin

(B) Streptomycin

(C) Erythromycin

(D) Tetracycline

Question 140.

One gene-one enzyme hypothesis was postulated by

[4 Marks]

(A) Hershey and Chase

(B) A. Garrod

(C) R. Franklin

(D) Beadle and Tatum

Question 141.

Which one of the following amino-acid was not found to be synthesized in Miller's experiment?

[4 Marks]

(A) Glycine

(B) Alanine

(C) Aspartic acid

(D) Glutamic acid

Question 142.

Evolutionary history of an organism is known as

[4 Marks]

(A) Ancestry

(B) Paleontology

(C) Phylogeny

(D) Ontogeny

Question 143.

An important evidence in favour of organic evolution is the occurrence of

[4 Marks]

(A) Analogous and vestigial organs

(B) Homologous and analogous organs

(C) Homologous organs only

(D) Homologous and vestigial organs

Question 144.

Jurassic period of the Mesozoic era was characterised by

[4 Marks]

(A) Radiation of reptiles and origin of mammal-like reptiles

(B) Gymnosperms were dominant plants and first birds appeared

(C) Flowering plants and first dinosaurs appeared

(D) Dinosaurs become extinct and angiosperms appeared

Question 145.

Which one of the following is not a living fossil?

[4 Marks]

(A) Sphenodon

(B) Archaeopteryx

(C) Peripatus

(D) King crab

Question 146.

The 'blue baby' syndrome results from

[4 Marks]

(A) excess of dissolved oxygen

(B) excess of chloride

(C) excess of TDS (total dissolved solids)

(D) methaemoglobin

Question 147.

Antibodies in our body are complex

[4 Marks]

(A) prostaglandins

(B) steroids

(C) glycoproteins

(D) lipoproteins

Question 148.

The cell in the human body invaded by the human immuno-deficiency virus (HIV) is

[4 Marks]

(A) T-helper cell

(B) Erythrocyte

(C) B-cell

(D) Macrophage

Question 149.

A person showing unpredictable moods, outbursts of emotion, quarrelsome behaviour and conflict with others is suffering from

[4 Marks]

(A) Borderline personality disorder (BPD)

(B) Addictive disorders

(C) Schizophrenia

(D) Mood disorders

Question 150.

Which one of the following is the most suitable medium for culture of Drosophila melanogaster?

[4 Marks]

(A) Agar agar

(B) Ripe banana

(C) Cow dung

(D) Moist bread

Question 151.

In maize, hybrid vigour is exploited by

[4 Marks]

(A) crossing of two inbred parental lines

(B) crossing between two unrelated reproductive plants

(C) inducing mutations

(D) bombarding the seeds with DNA

Question 152.

Crop plants grown in monoculture are

[4 Marks]

(A) low in yield

(B) highly prone to pests

(C) characterised by poor root system

(D) free from interspecific competition

Question 153.

Triticale, the first man-made cereal crop, has been obtained by crossing wheat with

[4 Marks]

(A) sugarcane

(B) pearl millet

(C) barley

(D) rye

Question 154.

Curing of tea leaves is brought about by the activity of

[4 Marks]

(A) viruses

(B) mycorrhiza

(C) fungi

(D) bacteria

Question 155.

Parthenocarpic tomato fruits can be produced by

[4 Marks]

(A) raising the plants from vernalized seeds

(B) treating the plants with low concentrations of gibberellic acid and auxins

(C) removing androecium of flowers before pollen grains are released

(D) treating the plants with phenylmercuric acetate

Question 156.

In order to obtain virus-free plants through tissue culture the best method is

[4 Marks]

(A) Embryo rescue

(B) Anther culture

(C) Protoplast culture

(D) Meristem culture

Question 157.

Two microbes found to be very useful in genetic engineering are

[4 Marks]

(A) Vibrio cholerae and a tailed bacteriophage

(B) Crown gall bacterium and Caenorhabditis elegans

(C) Escherichia coli and Agrobacterium tumefaciens

(D) Diplococcus sp. and Pseudomonas sp.

Question 158.

Golden rice is a transgenic crop of the future with the following improved trait:

[4 Marks]

(A) high lysine (essential amino acid) content

(B) high protein content

(C) high vitamin-A content

(D) insect resistance

Question 159.

People living at sea level have around 5 million RBC per cubic mm of blood whereas those living at an altitude of 5400 metres have around 8 million. This is because at high altitude

[4 Marks]

(A) there is more UV radiation which enhances RBC production

(B) atmospheric O_2 level is less and hence more RBCs are needed to absorb the required amount of O_2 to survive

(C) people eat more nutritive food, therefore more RBCs are formed

(D) people get pollution-free air to breathe and more oxygen is available

Question 160.

Niche overlap indicates

[4 Marks]

(A) two different parasites on the same host

(B) sharing of one or more resources between the two species

(C) mutualism between two species

(D) active cooperation between two species

Question 161.

The formula for exponential population growth is

[4 Marks]

(A) $dN/dt = rN$

(B) $dt/dN = rN$

(C) $rN/dN = dt$

(D) $dN/rN = dt$

Question 162.

Praying mantis is a good example of

[4 Marks]

(A) warning colouration

(B) social insects

(C) camouflage

(D) Mullerian mimicry

Question 163.

The amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis is called:

[4 Marks]

(A) Net primary production

(B) Secondary production

(C) Gross primary production

(D) Primary production

Question 164.

Vertical distribution of different species occupying different levels in a biotic community is known as:

[4 Marks]

(A) Stratification

(B) Zonation

(C) Divergence

(D) Pyramid

Question 165.

The greatest biomass of autotrophs in the oceans is that of

[4 Marks]

(A) sea grasses and slime moulds

(B) free floating microalgae, cyanobacteria and nanoplankton

(C) benthic brown algae, coastal red algae and aphids

(D) benthic diatoms and marine viruses

Question 166.

Which one of the following is not a function of an ecosystem?

[4 Marks]

(A) Energy flow

(B) Decomposition

(C) Stratification

(D) Productivity

Question 167.

Which one of the following is not used for construction of ecological pyramids?

[4 Marks]

(A) Number of individuals

(B) Rate of energy flow

(C) Fresh weight

(D) Dry weight

Question 168.

Which one of the following is the correct matched pair of an endangered animal and National Park?

[4 Marks]

(a)	Rhinoceros National Park	-	Kaziranga
(b)	Wild ass	-	Dudhwa National Park
(c)	Great Indian bustard	-	Keoladeo National Park
(d)	Lion Park	-	Corbett National

(A) a

(B) b

(C) c

(D) d

Question 169.

Which of the following pairs of an animal and a plant represents endangered organisms in India?

[4 Marks]

(A) Cinchona and leopard

(B) Banyan and black buck

(C) Tamarind and Rhesus monkey

(D) Bentinckia nicobarica and Red Panda

Question 170.

Which one of the following is not included under in-situ conservation?

[4 Marks]

(A) Botanical garden

(B) Biosphere reserve

(C) National park

(D) Sanctuary

Question 171.

Which of the following is considered a hotspot of biodiversity in India?

[4 Marks]

(A) Indo-Gangetic Plain

(B) Eastern Ghats

(C) Western Ghats

(D) Aravalli Hills

Question 172.

Photochemical smog pollution does not contain

[4 Marks]

(A) Nitrogen dioxide

(B) Carbon dioxide

(C) PAN (peroxy acetyl nitrate)

(D) Ozone

Question 173.

Limit of BOD prescribed by Central Pollution Control Board for the discharge of industrial and municipal waste waters into natural surface waters, is

[4 Marks]

(A) < 10 ppm

(B) < 100 ppm

(C) < 30 ppm

(D) < 3.0 ppm

Question 174.

During osmosis, flow of water through a semipermeable membrane is

[4 Marks]

(A) from both sides of semipermeable membrane with equal flow rates

(B) from both sides of semipermeable membrane with unequal flow rates

(C) from solution having lower concentration only

(D) from solution having higher concentration only

Question 175.

A solution containing g 10 g dm^{-3} of urea (molecular mass = 60g mol^{-1}) is isotonic with a 5% solution of a non-volatile solute. The molecular mass of this non-volatile solute is

[4 Marks]

(A) 250 g mol^{-1}

(B) 200 g mol^{-1}

(C) 350 g mol^{-1}

(D) 300 g mol^{-1}

Question 176.

1.00 g of a non-electrolyte (molar mass = 250 g mol^{-1}) was dissolved in 51.2 g of benzene. If freezing point depression constant, K_f of benzene is 5.12 K kg mol^{-1}, the freezing point of benzene will be lowered by

[4 Marks]

(A) 0.3 K

(B) 0.5 K

(C) 0.4 K

(D) 0.2 K

Question 177.

If $E^{o}_Fe^{2+} / Fe = -0.441$ V and $E^{o}_Fe^{3+} / Fe^{2+} = +0.771$ V, the standard EMF of the reaction $Fe + 2Fe^{3+} \rightarrow 3Fe^{2+}$ will be

[4 Marks]

(A) 0.330 V

(B) 0.111 V

(C) 1.212 V

(D) 1.653 V

Question 178.

A hypothetical electrochemical cell is shown below

$A \mid A^{+} (xM) \parallel B^{+} (yM) \mid B$
The emf measured is +0.20 V. The cell reaction is

[4 Marks]

(A) $A^{+} + e^{-} \rightarrow A; B^{+} + e^{-} \rightarrow B$

(B) The cell reaction cannot be predicted

(C) $A^{+} + B \rightarrow A + B^{+}$

(D) $A + B^{+} \rightarrow A^{+} + B$

Question 179.

For the reaction $2A + B \rightarrow 3C + D$

which of the following does not express the reaction rate?

[4 Marks]

(A) $-d[B] / dt$

(B) $d[D] / dt$

(C) $(-1 / 2) (d[A] / dt)$

(D) $(-1 / 3) (d[C] / dt)$

Question 180.

Consider the reaction
N_2 (g) + $3H_2$ (g) → $2NH_3$ (g)
The equality relationship between $d[NH_3] / dt$ and $(- d[H_2] / dt)$ is

[4 Marks]

(A) $d[NH_3] / dt = (-d[H_2] / dt)$

(B) $d[NH_3] / dt = (-1 / 3) (d[H_2] / dt)$

(C) $+ d[NH_3] / dt = (-2 / 3) (d[H_2] / dt)$

(D) $+d[NH_3]/dt = (-3 / 2)(d[H_2] / dt)$

Question 181.

For adsorption of a gas on a solid, the plot of log(x / m) vs log p is linear with slope equal to (n being whole number)

[4 Marks]

(A) k

(B) log k

(C) n

(D) 1 / n

Question 182.

Which of the following is the most basic oxide?

[4 Marks]

(A) Sb_2O_3

(B) Bi_2O_3

(C) SeO_2

(D) Al_2O_3

Question 183.

In which of the following pairs are both the ions coloured in aqueous solutions?

(At. no.: Sc = 21, Ti = 22, Ni = 28, Cu = 29, Co = 27)

[4 Marks]

(A) Sc^{3+}, Co^{2+}

(B) Ni^{2+}, Cu^{+}

(C) Sc^{3+}, Ti^{3+}

(D) Ni^{2+}, Ti^{3+}

Question 184.

Copper sulphate dissolves in excess of KCN to give

[4 Marks]

(A) $[Cu(CN)_4]^{3-}$

(B) $[Cu(CN)_4]^{2-}$

(C) CuCN

(D) $Cu(CN)_2$

Question 185.

The main reason for larger number of oxidation states exhibited by the actinoids than the corresponding lanthanoids, is

[4 Marks]

(A) more energy difference between 5f and 6d orbitals than between 4f and 5d orbitals.

(B) lesser energy difference between 5f and 6d orbitals than between 4f and 5d orbitals.

(C) larger atomic size of actinoids than the lanthanoids.

(D) greater reactive nature of the actinoids than the lanthanoids.

Question 186.

$[Co(NH_3)_4(NO_2)_2]$ Cl exhibits

[4 Marks]

(A) linkage isomerism, ionization isomerism and optical isomerism

(B) linkage isomerism, geometrical isomerism and optical isomerism

(C) linkage isomerism, ionization isomerism and geometrical isomerism

(D) ionization isomerism, geometrical isomerism and optical isomerism

Question 187.

$[Cr(H_2O)_6]Cl_3$ (at no. of Cr = 24) has a magnetic moment of 3.83 B.M. The correct distribution of 3d electrons in the chromium of the complex is

[4 Marks]

(A) $3d_{xy}^1, 3d_{yz}^1, 3d_{xz}^1$

(B) $3d_{xy}^1, (3d_{x^2-y^2})^1, 3d_{yz}^1$

(C) $(3d_{x^2-y^2})^1, 3d_{z^2}, 3d_{xz}^1$

(D) $3d_{xy}^1, 3d_{yz}^1, 3d_{z^1z^2}$

Question 188.

Which of the following is not chiral ?

[4 Marks]

(A) 2, 3-Dibromopentane

(B) 2-Hydroxypropanoic acid

(C) 3-Bromopentane

(D) 2-Butanol

Question 189.

Ethylene oxide when treated with Grignard reagent yields

[4 Marks]

(A) Tertiary alcohol

(B) Cyclopropyl alcohol

(C) Secondary alcohol

(D) Primary alcohol

Question 190.

The major organic product in the reaction,

$CH_3—O—CH(CH_3)_2 + HI \rightarrow$ Product is

[4 Marks]

(A)

$CH_3OH + (CH_3)_2CHI$

(B)

$CH_3I + (CH_3)_2CHOH$

(C)

$CH_3OC(CH_3)_2$ with I below

(D)

$ICH_2OCH(CH_3)_2$

Question 191.

A carbonyl compound reacts with hydrogen cyanide to form cyanohydrin which on hydrolysis forms a racemic mixture of α-hydroxy acid. The carbonyl compound is

[4 Marks]

(A) Formaldehyde

(B) Diethyl ketone

(C) Acetone

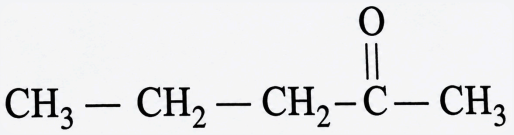
(D) Acetaldehyde

Question 192.

Nucleophilic addition reaction will be most favoured in

[4 Marks]

(A)



(B)

CH_3CHO

(C)

CH_3CH_2CHO

(D)

$(CH_3)_2C=O$

Question 193.

Self condensation of two moles of ethyl acetate in presence of sodium ethoxide yields

[4 Marks]

(A) acetoacetic ester

(B) methyl acetoacetate

(C) ethyl propionate

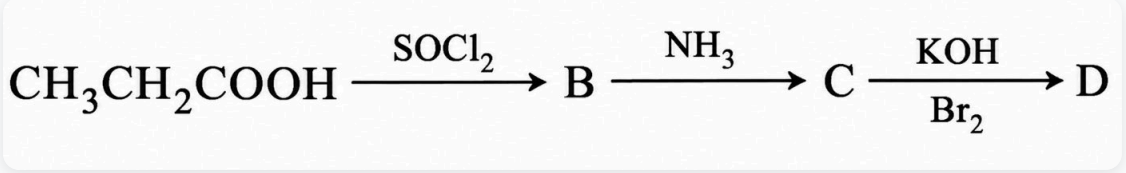
(D) ethyl butyrate

Question 194.

In a set of reactions propionic acid yielded a compound D.

The structure of D would b

[4 Marks]



(A) $CH_3CH_2NH_2$

(B) $CH_3CH_2CH_2NH_2$

(C) $CH_3CH_2CONH_2$

(D) $CH_3CH_2NHCH_3$

Question 195.

Which of the following is more basic than aniline?

[4 Marks]

(A) Triphenylamine

(B) p-Nitroaniline

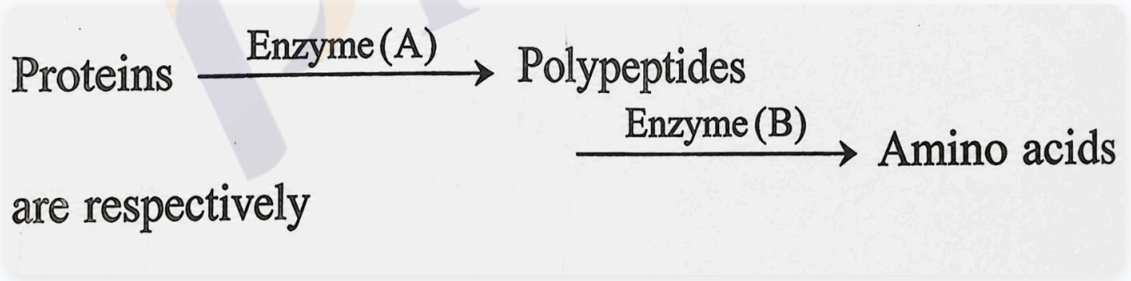
(C) Benzylamine

(D) Diphenylamine

Question 196.

During the process of digestion, the proteins present in food materials are hydrolysed to amino acids. The two enzymes involved in the process

[4 Marks]



(A) Diastase and Lipase

(B) Pepsin and Trypsin

(C) Amylase and Maltase

(D) Invertase and Zymase

Question 197.

Which one of the following is a peptide hormone ?

[4 Marks]

(A) Thyroxin

(B) Testosterone

(C) Adrenaline

(D) Glucagon

Question 198.

The human body does not produce

[4 Marks]

(A) Hormones

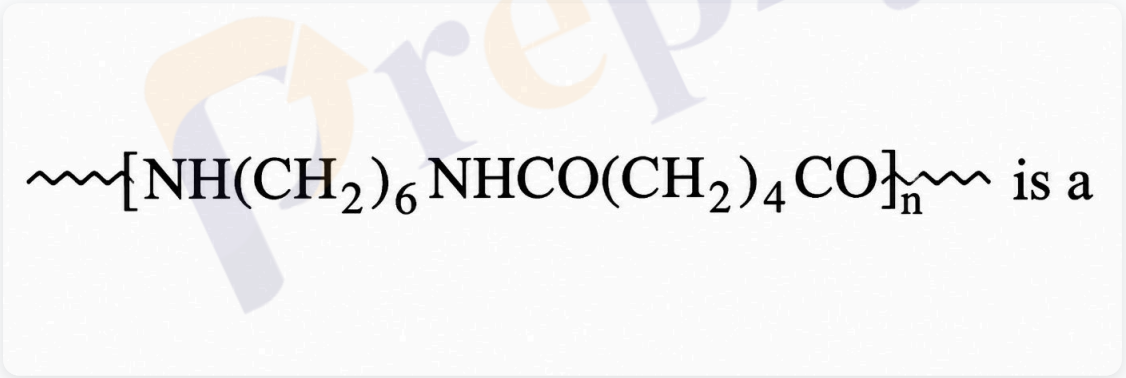
(B) Vitamins

(C) Enzymes

(D) DNA

Question 199.

[4 Marks]



(A) thermosetting polymer

(B) addition polymer

(C) copolymer

(D) homopolymer