

NOTICE :

**. IT IS INFORMED TO ALL THE STUDENTS THAT TIME TABLE FOR THE
CONSECUTIVE TESTS WOULD BE UPLOADED EVERY WEEK.**

**.WE KINDLY REQUEST ALL THE STUDENTS TO ENGAGE ONTO THE ONLINE TEST AT
9:00 AM (Morning).**

**.PLEASE SPREAD THE FOLLOWING MESSAGE TO ALL OF YOUR FELLOW MATES
THANK YOU .**

Q1

In insulators (C.B. is conduction band and V.B. is valence band)

- | | | | |
|--|--|--|--|
| 1) V.B. is partially filled with electrons | 2) C.B. is partially filled with electrons | 3) C.B. is empty and V.B. is filled with electrons | 4) C.B. is filled with electrons and V.B. is empty |
|--|--|--|--|

ANSWER

Band gap is nearly 6 eV and electrons are completely filled in V.B and where as C.B is empty

Q2

The threshold frequency for a certain photosensitive metal is ν_0 . When it is illuminated by light of frequency $\nu = 2\nu_0$, the maximum velocity of photoelectrons is v_0 . What will be the maximum velocity of the photoelectrons when the same metal is illuminated by light frequency $\nu = 5\nu_0$

- 1) $\sqrt{2}v_0$ 2) $2v_0$ 3) $2\sqrt{2}v_0$ 4) $4v_0$

ANSWER

$$\frac{1}{2}mV_0^2 = h(2\nu_0) - h\nu_0$$

$$\frac{1}{2}mV_0^2 = h\nu_0 \rightarrow (1)$$

$$\frac{1}{2}mV_2^2 = h(5\nu_0) - h\nu_0$$

$$\frac{1}{2}mV_2^2 = 4h\nu_0 \rightarrow (2)$$

$$(1) \ \& \ (2) \Rightarrow \frac{V_2^2}{V_0^2} = 4 \Rightarrow V_2 = 2v_0$$

Q3

In a n-type semiconductor, which of the following statement is true

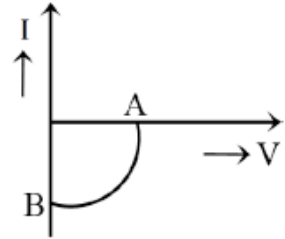
- a) holes are majority carriers and trivalent atoms are dopants
- b) electrons are majority carriers and trivalent atoms are dopants
- c) electrons are minority carriers and pentavalent atoms are dopants
- d) holes are minority carriers and pentavalent atoms are dopants

ANSWER

d) holes are minority carriers & pentavalent atoms are dopants

Q4

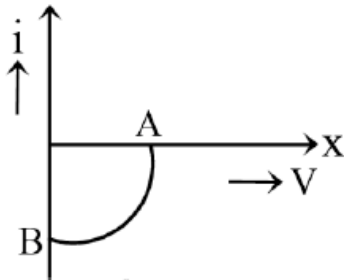
The given graph represents V-I characteristic for a semiconductor device. Which of the following statements is correct?



- | | | | |
|--|---|---|--|
| 1) It is for a solar cell and points A and B represent open circuit voltage and current, respectively. | 2) It is for a photodiode and points A and B represent open circuit voltage and current respectively. | 3) It is for a LED and points A and B represent open circuit voltage and short circuit current, respectively. | 4) It is V-I characteristic for solar cell where, point A represents open circuit voltage and point B short circuit current. |
|--|---|---|--|

ANSWER

It is a V-I characteristics ties of solar cell where point A represents open circuit voltage and point B short circuit current.



Q5.

Let K_1 be the maximum kinetic energy of photoelectrons emitted by light of wavelength λ_1 and K_2 corresponding to wavelength λ_2 . If $\lambda_1 = 2\lambda_2$. then.

- 1) $2K_1 = K_2$ 2) $K_2 > K_1$ 3) $K_1 < \frac{K_2}{2}$ 4) $K_1 > 2K_2$

ANSWER

$$K = \frac{hc}{\lambda} - \phi$$

$$K_1 = \frac{hc}{\lambda_1} - \phi \rightarrow (1)$$

$$K_2 = \frac{hc}{\lambda_2} - \phi \rightarrow (2) \text{ \& } \lambda_1 = 2\lambda_2$$

$$K_2 = \frac{2hc}{\lambda_1} - \phi$$

$$K_2 = K_1 + \frac{hc}{\lambda_1}$$

$$2K_1 = \frac{2hc}{\lambda_1} - 2\phi$$

$$K_2 = \frac{2hc}{\lambda_1} - \phi$$

$$K_2 - 2K_1 = \phi$$

$$\frac{K_2}{2} = 2K_1 + \phi$$

Q6

The magnetic field in a travelling electromagnetic wave has a peak value of 20 nT. The peak value of electric field strength is:

- 1) 3V/m 2) 6V/m 3) 9V/m 4) 12 V/m

ANSWER

Speed of electromagnetic wave $c = 3 \times 10^8 \text{ m/s}$

peak value of magnetic field $B_0 = 20 \times 10^{-9} \text{ T}$

$$E_0 = cB_0 = 3 \times 10^8 \text{ m/s} \times 20 \times 10^{-9} \text{ T} = 6 \text{ V/m}$$

Q7

A doped semiconductor is

- 1) Positively charged 2) Negatively charged 3) electrically neutral 4) may be positive or negative

ANSWER

Always, any doped semiconductor is electrically neutral

Q8

Three semi-conductors are arranged in the increasing order of their energy gap as follows. The correct arrangement is

- | | | | |
|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| 1) Tellurium, germanium, silicon | 2) Tellurium, silicon, germanium | 3) Silicon, germanium, tellurium | 4) Silicon, tellurium, germanium |
|----------------------------------|----------------------------------|----------------------------------|----------------------------------|

ANSWER

The correct order of band gap is

$$T_e > G_e > Si$$

Q9

For the given combination of gates, if the logic states of inputs A, B, C are as follows $A = B = C = 0$ and $A = B = 1, C = 0$ then the logic states of output D are:

- 1) 0, 0 2) 0, 1 3) 1, 0 4) 1, 1

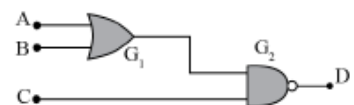
ANSWER

The output D for the given combination

$$D = \overline{(A + B)} \cdot C = \overline{(A + B)} + \bar{C}$$

$$\text{If } A = B = C = 0 \text{ then } D = \overline{(0 + 0)} + \bar{0} = \bar{0} + \bar{0} = 1 + 1 = 1$$

$$\text{If } A = B = 1, C = 0 \text{ then } D = \overline{(1 + 1)} + \bar{0} = \bar{1} + \bar{0} = 0 + 1 = 1$$



Q10

When the wavelength of the incident photon is decreased then:

- | | | | |
|---|--|--|-------------------------------------|
| 1) Velocity of emitted photo-electron decreases | 2) Velocity of emitted photoelectron increases | 3) Velocity of photoelectron do not charge | 4) Photo electric current increases |
|---|--|--|-------------------------------------|

ANSWER

With decrease in wavelength of incident photons, energy of photoelectrons increases.

Q11

An N-type silicon of width $4 \times 10^{-3} \text{ m}$, thickness and length $6 \times 10^{-2} \text{ m}$ carries a current of 4.8 mA, when the voltage is applied across the length of the sample. The free electron density is 10^{22} m^{-3}

- | | | | |
|------------------------------------|-----------------------------------|---|----------------------------|
| 1) The current density is 20 A / m | 2) The drift speed is 1.25 cm/sec | 3) The time taken by electrons to travel the full length of the sample is 4.8 sec | 4) All options are correct |
|------------------------------------|-----------------------------------|---|----------------------------|

2

ANSWER

$$1) J = \frac{I}{A} = \frac{4.8 \times 10^{-3}}{wt} = \frac{4.8 \times 10^{-3}}{4 \times 10^{-3} \times 6 \times 10^{-2}}$$

$$= 20 \text{ A/m}^2$$

$$2) V_d = \frac{J}{ne} = \frac{20}{10^{22} \times 1.6 \times 10^{-19}}$$

$$= 1.25 \text{ cm/sec}$$

$$3) \text{time } (t) = \frac{l}{V_d} = \frac{6 \times 10^{-2}}{1.25 \times 10^{-2}}$$

$$= 4.8 \text{ sec}$$

Q12

Light waves travel in vaccum along the y-axis which of the following may represent the wavefront

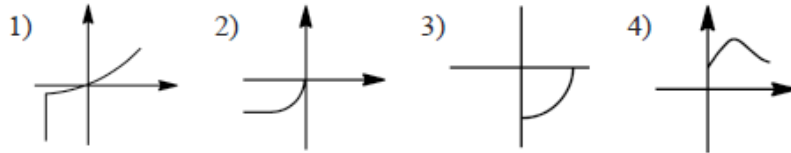
- 1) x=constant 2) y=constant 3) z=constant 4) x+y+z=constant

ANSWER

Light waves travel in vaccum along the y-axis y = constant represent the wave front.

Q13

Which of the following best represents the I-V characteristics of a solar cell? (I on y axis, V on x-axis)



ANSWER

I-V characteristics of a solar cell is represented by the 3rd option given in the circuit.

Q14

A pure Ge crystal has $3.0 \times 10^{28} \text{ atoms}/m^3$. It is doped by 1 part per 10 million concentration of trivalent Ga. The number density of electrons is: (given $n_i = 1.5 \times 10^{16}/m^3$)

- 1) $3.0 \times 10^{21}/m^3$ 2) $7.5 \times 10^{10}/m^3$ 3) $3.0 \times 10^{35}/m^3$ 4) $1.5 \times 10^9/m^3$

ANSWER

Pure Ge has $3 \times 10^{28} \text{ atoms}/m^3$; $n_i = 1.5 \times 10^{16}/m^3$

doped Ga-10PPM = $10 \times 10^6 = 10^7$

\therefore No of holes is $n_h = \frac{3 \times 10^{28}}{10 \times 10^6} = 3 \times 10^{21}$

No of electrons, $n_e = \frac{n_i^2}{n_h} = \frac{(1.5 \times 10^{16})^2}{3 \times 10^{21}} = 7.5 \times 10^{10}/m^3$

Q15

The wavelength of an electron of energy 10keV will be

- 1) 0.12 A^0 2) 1.2 A^0 3) 12 A^0 4) 120 A^0

ANSWER

$$\lambda = \frac{12.27}{\sqrt{v}}$$

$$\lambda = \frac{12.27}{\sqrt{10 \times 10^3}}$$

$$\lambda = 0.12 \text{ A}^0$$

Q16

If the work function of a metal is Φ and the frequency of the incident light is ν , there is no emission of photoelectrons if:

1) $\nu < \frac{\phi}{h}$ 2) $\nu = \frac{\phi}{h}$ 3) $\nu > \frac{\phi}{h}$ 4) $\nu \geq \frac{\phi}{h}$

ANSWER

For no emission of photoelectron, energy of incident light < Work function $\Rightarrow h\nu < \phi \Rightarrow \nu < \frac{\phi}{h}$

Q17

A lamp emits monochromatic green light uniformly in all directions. The lamp is converting electrical power to electromagnetic waves and consumes 100 W of power. The amplitude of the electric field associated with the electromagnetic radiation at a distance of 5 m from the lamp will be:

1) 1.34 V/m 2) 2.68 V/m 3) 4.02 V/m 4) 15.5 V/m

ANSWER

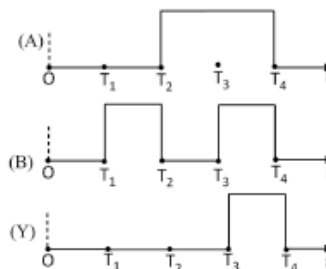
$$I = \frac{\text{Power}}{\text{Area}} = \frac{1}{2} \epsilon E^2 C$$

$$E = \sqrt{\frac{2 \cdot P}{4 \pi r^2 \epsilon_0 C}}$$

Q18

The given figure shows the wave forms for two inputs A and B and that for the output Y of logic circuit.

The logic circuit is



1) AND gate 2) OR gate 3) NAND gate 4) NOT gate

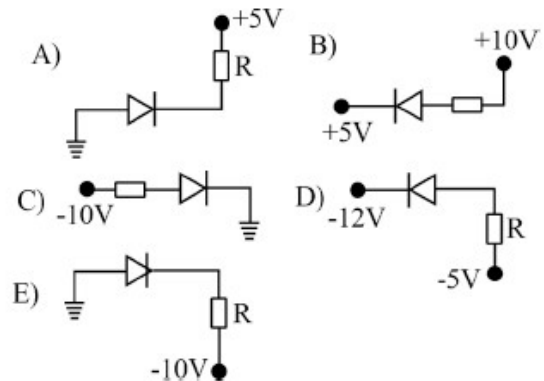
ANSWER

The wave forms for two inputs A and B used to a logic gate, the out put of logic circuit given in the diagram reveals that, this gate is an AND gate

Q19

In the given figure, which of the diodes are forward biased

- 1) A,B,C 2) B,D,E 3) A,C,D 4) B,C,D



ANSWER

From the given figures

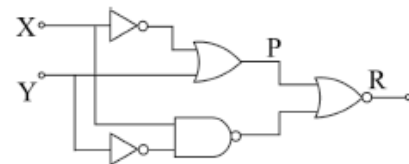
high potential to low potential is highly forward biased.

∴ B, D, E are forward biased.

Q20

The figure gives a system of logic gates. From the study of truth tables, it can be found that to produce a high output (1) at R, we must have:

- 1) X=0,Y=1 2) X=1,Y=1 3) X=1,Y=0 4) X=0,Y=0



ANSWER

By choosing elimination method, If $x=1, y=0$ then output is '1'.

Q21

The cathode of a photoelectric cell is changed such that the work function changes from W_1 to W_2 ($W_2 > W_1$). If the current before and after change are I_1 and I_2 , all other conditions remaining unchanged, then: (assuming $h\nu > W_2$)

- 1) $I_1 = I_2$ 2) $I_1 < I_2$ 3) $I_1 > I_2$ 4) $I_1 < I_2 < 2I_1$

ANSWER

The work function has no effect on current so long as $h\nu > W_0$. The photoelectric current is proportional to the intensity of light. Since there is no change in the intensity of light, therefore $I_1 = I_2$.

Q22

de-Broglie wavelength of a body of mass m and kinetic energy E is given by

1) $\lambda = \frac{h}{mE}$ 2) $\lambda = \frac{\sqrt{2mE}}{h}$ 3) $\lambda = \frac{h}{2mE}$ 4) $\lambda = \frac{h}{\sqrt{2mE}}$

ANSWER

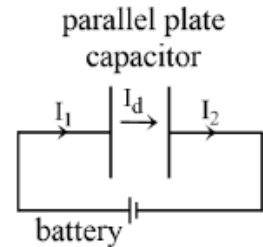
$$\lambda = \frac{h}{p} = \frac{h}{\sqrt{2mK.E}}$$

$$K.E = \frac{p^2}{2m}$$

$$p = \sqrt{2mK.E}$$

Q23

A parallel plate capacitor is connected to a battery and is getting charged. During the charging process, at any instant of time, the current in the wire connected to battery positive is I_1 , the current in the wire connected to battery negative is I_2 and the displacement current between the plates of the capacitor is I_d . Which of the following is the correct relation between the currents?



1) $I_1 = I_d = I_2$ 2) $I_1 = I_d + I_2$ 3) $I_1 = I_d - I_2$ 4) $I_1 + I_d + I_2 = 0$

ANSWER

$$I_c = \frac{d\phi}{dt}$$

$$I_d = \epsilon_0 \frac{d}{dt} (\vec{E} \cdot \vec{A})$$

$$= \epsilon_0 \frac{d}{dt} \left(\frac{\sigma}{\epsilon_0} \cdot A \right)$$

$$= \frac{dQ}{dt}$$

$$\Rightarrow I_d = I_c \quad \therefore I_1 = I_d = I_2$$

Q24

Band gap in insulator is of the order

1) 6 eV 2) 0.60 eV 3) -6 eV 4) 0 eV

ANSWER

The band gap in insulator is of order of nearly 6eV

Q25

A photon in motion has a mass:

- 1) $c/h\nu$ 2) h/ν 3) $h\nu$ 4) $h\nu/c^2$

ANSWER

$$E = h\nu = mc^2 \Rightarrow m = \frac{h\nu}{c^2}$$

Q26

The average wavelength of de-Broglie wave associated with a thermal neutron of mass m at absolute temperature T is given by (here k is the Boltzmann constant) :

- 1) $\frac{h}{\sqrt{mkT}}$ 2) $\frac{h}{\sqrt{2mkT}}$ 3) $\frac{h}{\sqrt{3mkT}}$ 4) $\frac{h}{2\sqrt{mkT}}$

ANSWER

$$\lambda = \frac{h}{\sqrt{2mE}} \rightarrow (1)$$

$$E = \frac{3}{2}kT \rightarrow (2)$$

$$\lambda = \frac{h}{\sqrt{2m \frac{3}{2}kT}}$$

$$\lambda = \frac{h}{\sqrt{3mkT}}$$

Q27

When forward bias is applied to a P-N junction, what happens to the potential barrier V_B , and the width of charge depleted region x ?

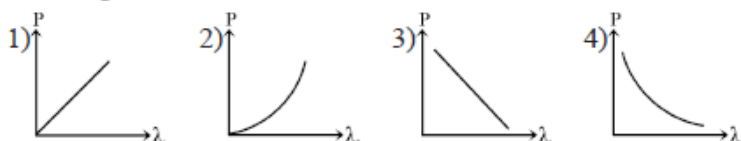
- 1) V_B increases, x decreases 2) V_B decreases, x increases 3) V_B increases, x increases 4) V_B decreases, x decreases

ANSWER

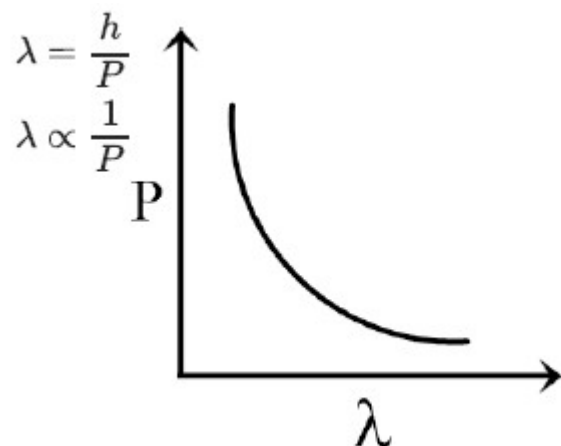
In forward biasing both V_B and x decreases.

Q28

Which of the following figure represents the variation of particle momentum and the associated de-Broglie wavelength?

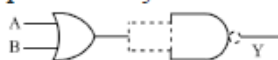


ANSWER



Q29

The gate represented by the block diagram is:



- 1) AND 2) NOT 3) NAND 4) NOR

ANSWER

In the given diagram, the logic gate must be 'NOR' gate.

Q30

Match List I (Wavelength range of electromagnetic spectrum) with List II. (Method of production of these waves).

List-I	List-II
(a) 700 nm to 1 mm	(i) Vibration of atoms and molecules
(b) 1 nm to 400 nm	(ii) Inner shell electrons in atoms moving from one energy level to a lower level
(c) $< 10^{-3}$ nm	(iii) Radioactive decay of the nucleus
(d) 1 mm to 0.1 m	(iv) Magnetron value

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

ANSWER

700 nm to 1 mm - Vibration of atoms and molecules

1 nm to 400 nm - Inner shell e^- in atoms moving from one energy level to a lower level

$< 10^{-3}$ nm - Radioactive decay of the nucleus

1 mm to 0.1 m - Magnetron value.

Q31

When light falls on semiconductors, their resistance

- 1) Decreases 2) Increases 3) Does not change 4) Can't be predicted

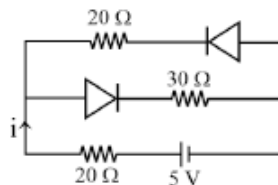
ANSWER

When light fall on semiconductor, number of charge carriers increases, hence resistance decreases.

Q32

Current in the circuit will be:

- 1) $\frac{5}{40} A$ 2) $\frac{5}{50} A$ 3) $\frac{5}{10} A$ 4) $\frac{5}{20} A$



ANSWER

The diode in lower branch is forward biased and diode in upper branch is reverse biased

$$\therefore i = \frac{5}{20 + 30} = \frac{5}{50} A$$

Q33

If 5% of the energy supplied to a bulb is irradiated as visible light, how many quanta are emitted per second by a 100 W lamp? Assume wavelength of visible light is $5.6 \times 10^{-5} cm$

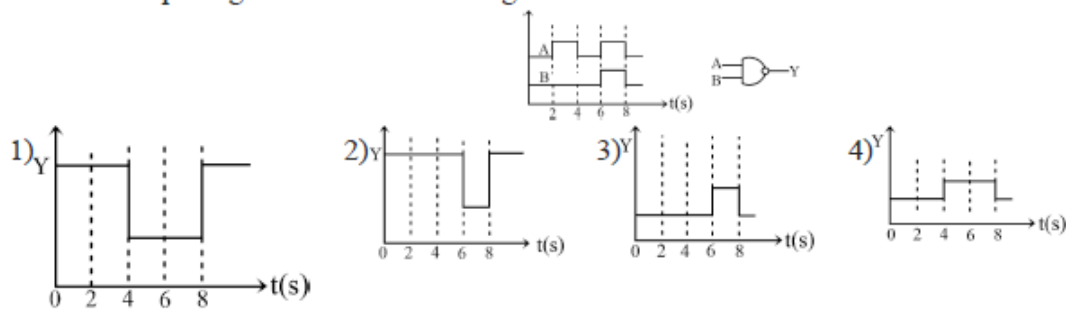
- 1) 1.4×10^{19} 2) 3×10^3 3) 1.4×10^{-19} 4) 3×10^4

ANSWER

$$\begin{aligned} 5\% \text{ power} &= \left(\frac{n}{t} \right) \frac{hc}{\lambda} \\ \frac{5}{100} \times 100 &= \left(\frac{n}{t} \right) \frac{6.62 \times 10^{-34} \times 3 \times 10^8}{5.6 \times 10^{-7}} \\ \frac{n}{t} &= \frac{5 \times 5.6 \times 10^{19}}{20} \\ &= 1.4 \times 10^{19} \end{aligned}$$

Q34

The realtime variation of input signal A and B are as shown. If the inputs are fed into a NAND gate, then select the output signal from the following:



ANSWER

For the NAND gate, the output waveform obeying its truth table. Hence the corresponding choice is '2'.

Q35

The de-Broglie wavelength of an electron moving with a velocity $c/2$ (c = velocity of light in vacuum) is equal to the wavelength of a photon. The ratio of the kinetic energies of electrons and photon is

- 1) 1 : 4 2) 1 : 2 3) 1 : 1 4) 2 : 1

ANSWER

The de-Broglie wavelength, $\lambda = \frac{h}{mv}$

Here $\lambda = \frac{h}{m_e \frac{c}{2}}$ and $\lambda_p = \frac{h}{m_p c}$

Given, $\lambda_e = \lambda_p$

So, $\frac{h}{m_e \frac{c}{2}} = \frac{h}{m_p c} \Rightarrow \frac{\mu_e}{\mu_p} = 2$

Ratio of KE $\frac{k_e}{k_p} = \frac{\frac{1}{2} m_e v_e^2}{\frac{1}{2} m_p v_p^2} = \frac{2 m_p c^2}{4 m_p c^2} = \frac{1}{2}$

Q36

Instantaneous displacement current of 1 A in the space between the parallel plates of a 1 μ F capacitor can be established by changing the potential difference of:

- 1) $10^{-6} V/s$ 2) $10^6 V/s$ 3) $10^{-8} V/s$ 4) $10^8 V/s$

ANSWER

$$\Rightarrow \frac{V}{t} = \frac{i}{C} = \frac{1}{10^{-6}} = 10^6 V/s$$

Q37

A parallel plate capacitor consists of two circular plates each of radius 12 cm and separated by 5.0 mm. The capacitor is being charged by external source. The charging current is constant and is equal to 0.15 A. The rate of change of potential difference between the plates will be:

- 1) $1.873 \times 10^7 V/s$ 2) $1.873 \times 10^8 V/s$ 3) $1.873 \times 10^9 V/s$ 4) $1.873 \times 10^{10} V/s$

ANSWER

$$\begin{aligned} \frac{dv}{dt} &= \frac{1}{C} = \frac{Id}{A\epsilon_0} \\ &= \frac{0.15 \times 5 \times 10^{-3}}{3.14 \times 144 \times 10^{-4} \times 8.85 \times 10^{-12}} \\ &= \frac{7.5}{4} \times 10^9 \\ &= 1.87 \times 10^9 V/s \end{aligned}$$

Q38

The ozone layer absorbs:

- 1) Infrared radiations 2) ultraviolet radiations 3) X-rays 4) γ -rays

ANSWER

Ozone layer absorbs ultraviolet radiations.

Q39

Which of the following is incorrect?

- | | | | |
|--|---|--|--|
| 1) In solar cell, diode operated in forward bias | 2) Zener diode used as voltage regulator in reverse bias under breakdown region | 3) For Si diode minimum required forward voltage so that current can flow is 0.7 V | 4) p – type, n – type and P – N junction diodes all are electrically neutral |
|--|---|--|--|

ANSWER

The correct option is (1) because solar cell is operated not in any bias means unbiased.

Q40

The frequencies of X-rays, γ – rays and ultraviolet rays are respectively a, b and c. Then:

- 1) $a < b, b > c$ 2) $a > b, b > c$ 3) $a > b, b < c$ 4) $a < b, b < c$

ANSWER

$$\nu_{\gamma\text{-rays}} > \nu_{X\text{-rays}} > \nu_{UV\text{-rays}}$$

Q41

A Germanium specimen is doped with Aluminium. The concentration of acceptor atoms is $\sim 10^{21} / \text{m}^3$. Given that the intrinsic concentration of electron hole pairs is $\sim 10^{19} / \text{m}^3$. The concentration of electrons in the specimen is

- a) $10^{17} / \text{m}^3$ b) $10^{15} / \text{m}^3$ c) $10^4 / \text{m}^3$ d) $10^2 / \text{m}^3$

ANSWER

a) $10^{17} / \text{m}^3$

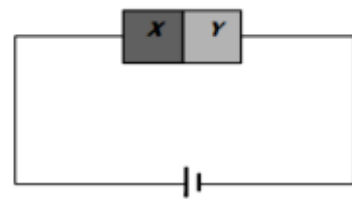
$$\begin{aligned} n_i^2 &= n_e n_h \\ \Rightarrow (10^{19})^2 &= n_e (10^{21}) \\ \Rightarrow n_e &= \underline{\underline{10^{17}}} \end{aligned}$$

Q42

A semiconductor X is made by doping a germanium crystal with arsenic ($Z=33$). A second semiconductor Y is made by doping germanium with indium ($Z=49$).

The two are joined end to end and connected to a battery as shown. Which of the following statements is correct

- a) X is P-type, Y is N-type and the junction is forward biased
b) X is N-type, Y is P-type and the junction is forward biased
c) X is P-type, Y is N-type and the junction is reverse biased
d) X is N-type, Y is P-type and the junction is reverse biased



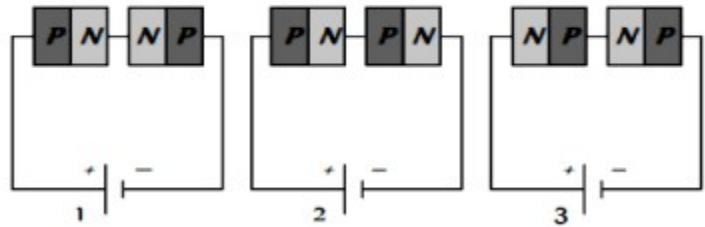
ANSWER

d) X is N-type, Y is P-type and the junction is reverse biased.

Q43

Two PN junctions can be connected in series by three different methods as shown in the figure. If the potential difference in the junctions is the same, then the correct connections will be

- a) In the circuit (1) and (2)
- b) In the circuit (2) and (3)
- c) In the circuit (1) and (3)
- d) Only in the circuit (1)



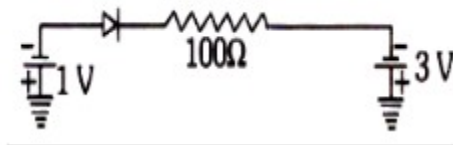
ANSWER

b) In the circuit (2) and (3)

Q44

The current through an ideal p-n junction diode shown in the figure is

- a) 20mA
- b) 10mA
- c) 0mA
- d) 50mA



ANSWER

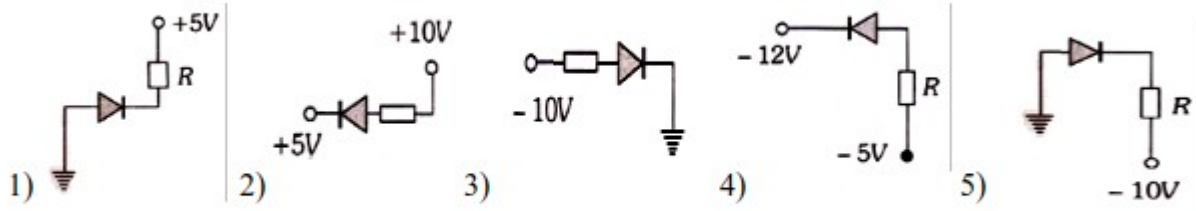
a) 20mA

Diode is forward biased.

$$\therefore I = \frac{V}{R} = \frac{2}{100} = \underline{\underline{20mA}}$$

Q45

In the given figure, which of the diodes are forward biased



a) 1, 2, 3

b) 2, 4, 5

c) 1, 3, 4

d) 2, 3, 4

ANSWER

b) 2, 4, 5

Q46

Each polypeptide in a protein has amino acids linked with each other in a specific sequence. This sequence of amino acids is said to be

- 1) Primary structure of proteins 2) Secondary structure of proteins 3) Tertiary structure of proteins 4) Quaternary structure of proteins

ANSWER

The arrangement of the sequence of amino acids linked to each other through peptide bonds is called the primary structure of a protein polymeric chain. This structure is unaffected even after denaturation of the protein.

Q47

Which one given below is a non-reducing sugar ?

- 1) Sucrose 2) Maltose 3) Lactose 4) Glucose

ANSWER

Reducing groups of glucose and fructose are involved in glycosidic linkage.

Q48

The vitamin which plays an important role in coagulating blood is

- 1) vitamin E 2) vitamin K 3) vitamin B_6 4) vitamin B_{12}

ANSWER

Deficiency of vitamin K causes increases blood clotting time.

Q49

0.7 g of $Na_2CO_3 \cdot xH_2O$ is dissolved in 100 ml, 20 ml of which required 19.8 ml of 0.1 N HCl. The value of x is

- 1) 4 2) 3 3) 2 4) 1

ANSWER

$$N = \frac{0.7}{\left(\frac{106+x \cdot 18}{2}\right)} \times \frac{1000}{100}$$

$$N = \frac{14}{106 + 18x}$$

$$N_1 V_1 = N_2 V_2$$

$$\frac{14}{106 + 18x} \times 20 = 0.1 \times 19.8$$

$$x = 2$$

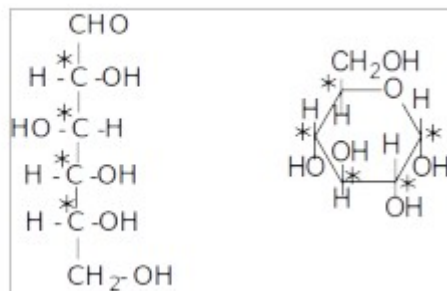
Q50

Number of stereo centers present in linear and cyclic structures of glucose are respectively:

- 1) 4 & 4 2) 4 & 5 3) 5 & 4 4) 5 & 5

ANSWER

Ans: 2



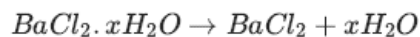
Q51

A sample of a hydrate of barium chloride weighing 61 g was heated until all the water of hydration is removed. The dried sample weighed 52 g. The formula of the hydrated salt is: (atomic mass, Ba=137 amu, Cl=35.5 amu)

- 1) $BaCl_2 \cdot H_2O$ 2) $BaCl_2 \cdot 2H_2O$ 3) $BaCl_2 \cdot 3H_2O$ 4) $BaCl_2 \cdot 4H_2O$

ANSWER

The chemical equation for heating of hydrated barium chloride is



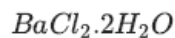
weight of water removed = 61 - 52 = 9 gr

$$nH_2O = \frac{9}{18} = \frac{1}{2}$$

Molecular weight of $BaCl_2$ = 208

$$nBaCl_2 = \frac{52}{208} = \frac{1}{4}$$

simplest formula : $\frac{1}{4} : \frac{1}{2} = 1 : 2$



Q52

Choose the correct statement from the following

- | | | | |
|--|--|---|--|
| 1) All amino acids have common isoelectric point | 2) All naturally occurring - amino acids are optically active except glycine | 3) At pH= 0 all amino acids are present as their anions | 4) In strongly basic solutions, all amino acids are present as their cations |
|--|--|---|--|

ANSWER

Except glycine all amino acids are optically active.

Q53

The hormone that helps in the conversion of glucose to glycogen is

- 1) Adrenaline 2) Insulin 3) Cortisone 4) Bile acids

ANSWER

Insulin is a hormone secreted by the pancreas that lowers blood glucose level by promoting the uptake of glucose by cells and the conversion of glucose to glycogen by the liver and skeletal muscle.

Q54

Which of the following proteins acts as a messenger in living system?

- 1) Hormone 2) Enzyme 3) Protective protein 4) Transport protein

ANSWER

Hormones are chemical messengers that are directly into blood from endocrine or ductless glands. Blood carries them into organs and tissues to carry out specific functions.

Q55

The sequence in which the α -amino acids are linked to one another in a protein molecule is called its

- 1) Primary structure 2) secondary structure 3) Tertiary structure 4) quaternary structure

ANSWER

The primary structure of a protein is the arrangement of linear sequence of amino acids that makes up a protein.

Q56

Trans-form of polyisoprene is

- 1) Guttapercha 2) Hydrochloride rubber 3) Buna-N 4) Synthetic rubber

ANSWER

Guttapercha rubber is very hard horny material consisting of trans 1, 4 - polyisoprene polymer

Q57

Complete hydrolysis of cellulose gives

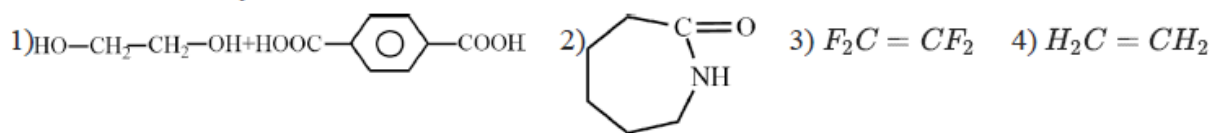
- 1) α -D-fructose 2) α -D-ribose 3) β -D-glucose 4) L-glucose

ANSWER

β -D-glucose is the monomer of cellulose.

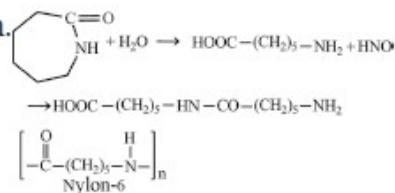
Q58

The monomer of Nylon-6 is/are



ANSWER

The monomer used in the preparation of Nylon-6 is caprolactam.



Q59

Which of the following statements is not true about sucrose?

- 1) The Glycosidic linkage is present between C_1 of α -Glucose and C_1 of β -fructose.
- 2) It is also named as invert sugar
- 3) It is a non reducing sugar
- 4) On hydrolysis, it produces glucose and fructose

ANSWER

Ans : 1, Glycosidic linkage is between C_1 of α -Glucose and C_2 of β -fructose.

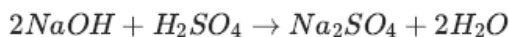
Q60

In the titration of a certain H_2SO_4 solution, 60 mL of 5.0 M NaOH solution was used to completely neutralize 75 ml of the acid. The molarity of the acid solution may be expressed as:

1) $\frac{5M \times 50mL}{2 \times 75mL}$ 2) $\frac{5M \times 75mL \times 2}{60mL}$ 3) $\frac{75mL \times 2}{5.0M \times 60mL}$ 4) $\frac{60mL \times 75mL \times 2}{5.0M}$

ANSWER

From Question data; NaOH (vs) H_2SO_4



$$\frac{M_1 V_1}{n_1} = \frac{M_2 V_2}{n_2}$$

$$M_1 = \text{NaOH molarity} = 5M$$

$$M_2 = \text{H}_2\text{SO}_4 \text{ molarity}$$

$$V_1 = \text{NaOH volume} = 60 \text{ ml}$$

$$V_2 = \text{H}_2\text{SO}_4 \text{ volume} = 75$$

$$n_1 = \text{mole number of NaOH} = 2$$

$$n_2 = \text{mole number of H}_2\text{SO}_4 = 1$$

$$\Rightarrow \frac{5 \times 60}{2} = \frac{75 \times M_2}{1}$$

$$M_2 = \frac{2 \times 75}{5 \times 60}$$

Q61

Starch is composed of two polysaccharides namely

- | | | | |
|-----------------------------|-------------------------|----------------------------|--------------------------------------|
| 1) Amylopectin and glycogen | 2) Amylose and glycogen | 3) Amylose and amylopectin | 4) Amylose, amylopectin and glycogen |
|-----------------------------|-------------------------|----------------------------|--------------------------------------|

ANSWER

Natural starch is composed of about 10 - 20% amylose and 90 - 80% of amylopectin

Q62

The secondary structure of a protein refers to

- | | | | |
|--------------------------------|-----------------------------|---------------------------------------|---|
| 1) α -helical back bone | 2) hydrophobic interactions | 3) sequence of α - amino acids | 4) Fixed configuration of the polypeptide back bone |
|--------------------------------|-----------------------------|---------------------------------------|---|

ANSWER

Secondary structures of proteins involve α - helical back-bonding and β -sheet structures. These are formed as a result of hydrogen bonding between different peptide groups.

(or)

The secondary structure is the three dimensional form of small areas of a protein. They are commonly helixes formed by peptide bond formation involving α -amino acids.

Q63

In elastomer, intermolecular forces are:

- 1) Nil 2) Weak 3) Strong 4) Very strong

ANSWER

Elastomer are having weak intermolecular forces.

Q64

Intermolecular forces are strongest in

- 1) rubber 2) Orlon 3) polypropylene 4) Nylon 6

ANSWER

Nylon-6 is polyamide and it belongs to Fibre. So, inter molecular forces are strong.

Q65

74.5 g of a metallic chloride contains 35.5 g of chlorine. The equivalent weight of the metal is

- 1) 19.5 2) 35.5 3) 39.0 4) 78.0

ANSWER

$$\text{eq.wt of metal} = \frac{\text{wt. of metal}}{\text{wt. of chloride}} \times 35.5$$

$$\text{wt. of metal chloride} = 74.5$$

$$\text{wt of chlorine} = 35.5$$

$$\text{wt. of metal} = 39, (74.5 - 35.5 = 39)$$

$$\text{eq.wt of metal} = \frac{39}{35.5} \times 35.5 = 39$$

Q66

A codon has a sequence of A and specifies a particular B that is to be incorporated into a C. What are?

A, B, C

- | | | | |
|--|---|---|---|
| 1) A - 3 bases B - Amino acid C - Carbohydrate | 2) A - 3 acids B - Carbohydrate C - Protein | 3) A - 3 bases B - Protein C - Amino acid | 4) A - 3 bases B - Amino acid C - Protein |
|--|---|---|---|

ANSWER

Codon has sequence of 3 bases + aminoacid + protein

3 DNA or RNA bases + Amino acid derivative + protein

Q67

Terylene is the polymer of

- | | | | |
|--|------------------------------|------------------------------------|--|
| 1) Ethylene glycol and terephthalic acid | 2) Melamine and formaldehyde | 3) Vinyl chloride and formaldehyde | 4) Hexamethylene diamine and adipic acid |
|--|------------------------------|------------------------------------|--|

ANSWER

Terylene is the polymer of

Q68

The enzyme which hydrolyses triglycerides to fatty acids and glycerol is called

- 1) maltose 2) zymase 3) lipase 4) pepsin

ANSWER

Fats and oils are important constituents of diet and are collectively called lipids. The termination ase is used to indicate an enzyme catalyst causing break down of lipids. Glycerides are esters which are hydrolyzed to acid and glycerol by a lipase.

Q69

PVC is used for

- | | | | |
|-----------------------------|-------------------------|---------------------------------|---------------------------------|
| 1) Manufacture of cosmetics | 2) Manufacture of tyres | 3) Manufacture of nonstick pans | 4) Manufacture of plastic pipes |
|-----------------------------|-------------------------|---------------------------------|---------------------------------|

ANSWER

PVC is polyvinyl chloride, which is used in manufacture of plastic pipes

Q70

The term anomers of glucose refers to

- 1) Isomers of glucose that differ in configurations at carbons one and four (C-1 and C-4)
- 2) A mixture of (D)-glucose and (L)-glucose
- 3) Enantiomers of glucose
- 4) Isomers of glucose that differ in configuration at carbon one (C-1)

ANSWER

Ans : 4.

Q71

Chargaff's rule states that in an organism

- | | | | |
|-----------------------------------|---|---|---|
| 1) Amounts of all bases are equal | 2) Amount of adenine (A) is equal to that of thymine (T) and the amount of guanine (G) is equal to that of cytosine | 3) Amount of adenine (A) is equal to that of guanine (G) and the amount of thymine (T) is equal to that of cytosine (C) | 4) Amount of adenine (A) is equal to that of cytosine (C) and the amount of thymine (T) is equal to guanine (G) |
|-----------------------------------|---|---|---|

ANSWER

According to Chargaff's rule amount of adenine(A) is equal to that of thymine(T) and the amount of guanine(G) is equal to that of cytosine(C).

Q72

Volume of 0.6 M NaOH required to neutralize 30 cm³ of 0.4 M HCl is

- 1) 30 cm³ 2) 20 cm³ 3) 50 cm³ 4) 45 cm³

ANSWER

NaOH HCl

$$N_1 V_1 = N_2 V_2; 0.6 \times V_1 = 0.4 \times 30; V_1 = 20ml$$

Q73

RNA and DNA are chiral molecules, their chirality is due to

- 1) D-sugar component 2) L-sugar component 3) chiral bases 4) chiral phosphate ester unit

ANSWER

DNA has a phosphate unit, a sugar unit called deoxyribose and four nitrogenous bases. It is sugar component that brings chirality to the DNA species.

Q74

A carbohydrate which can not be hydrolysed to simpler compounds is called

- 1) Monosaccharides 2) Disaccharide 3) Polysaccharide 4) Oligosaccharide

ANSWER

Monosaccharides are the simplest sugars which cannot be hydrolysed further.

Q75

Which of the following is a carbohydrate

- 1) Leucine 2) Albumin 3) Inulin 4) Maltase

ANSWER

Inulin is a carbohydrate which is stored in “Roots of Dahliya”.

Q76

Vegetable oils like wheat germ oil, sunflower oil, etc, are the good source of

- 1) Vitamin K 2) Vitamin E 3) Vitamin D 4) Vitamin A

ANSWER

Wheat germ oil is an oil obtained from the germ of wheat kernel. It is rich in vitamin E.

Q77

Glucose will show mutarotation when solvent is

- 1) Acidic 2) Basic 3) Neutral 4) Amphoteric

ANSWER

In neutral solvent, glucose shows mutarotation.

Q78

Which of the following is not a polyamide?

- 1) Nylon-66 2) Protein 3) Glyptal 4) Nylon-6

ANSWER

Glyptal is an alkyd resin of ethylene glycol ($HO - CH_2 - CH_2 - OH$) and phthalic acid, it is polyester

Q79

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

proteins $\xrightarrow{\text{enzyme (A)}}$ polypeptide $\xrightarrow{\text{enzyme (B)}}$ amino acids

- 1) invertase and zymase 2) amylase and maltase 3) diastase and lipase 4) pepsin and trypsin

ANSWER

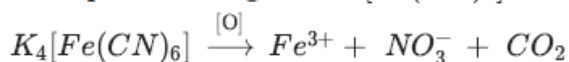
proteins $\xrightarrow{\text{enzyme (A)}}$ polypeptide $\xrightarrow{\text{enzyme (B)}}$ amino acids

proteins $\xrightarrow{\text{pep sin}}$ polypeptide

polypeptide $\xrightarrow{\text{tryp sin}}$ amino acids

Q80

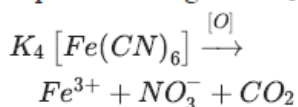
The equivalent weight of $K_4[Fe(CN)_6]$ in the given reaction is :



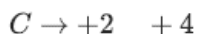
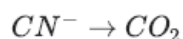
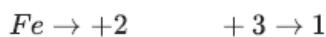
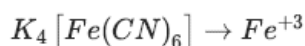
- 1) M/20 2) M/1 3) M/60 4) M/61

ANSWER

Equivalent weight of $K_4[Fe(CN)_6]$ in the given reaction is

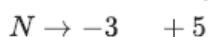
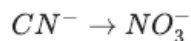


Equivalent weight of $K_4[Fe(CN)_6]$ = (Molecular weight of $K_4[Fe(CN)_6]$) / (difference between oxidation states)



difference between 1C atom = 2

difference between 6 carbon atoms = 12



difference between 1N atom = 8

difference between 6N atom = 48

∴ Total difference = 48 + 12 + 1 = 61

Equivalent weight of

$$K_4[Fe(CN)_6] = \frac{M}{61}$$

Q81

The number of essential amino acids in man is

- 1) 8 2) 10 3) 18 4) 20

ANSWER

The amino acids which can't be synthesised by human body so they are essential to take from diet. They are 10 in number.

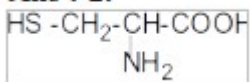
Q82

Thiol group is present in

- 1) Cystine 2) Cysteine 3) Methionine 4) Cytosine

ANSWER

Ans : 2.



Q83

During estimation of nitrogen in the organic compound evolved from 0.5 g of the compound in Kjeldahl's estimation of nitrogen, neutralised 10 mL of 1M H_2SO_4 . Find out the percentage of nitrogen in the compound.

- 1) 14% 2) 28% 3) 56% 4) 68%

ANSWER

1 M of 10 mL H_2SO_4 = 1 M of 20 mL NH_3

1000 mL of 1 M ammonia contains = 14 g nitrogen

20 mL of 1 M NH_3 contains = $\frac{14 \times 20}{1000}$ g nitrogen

% age of nitrogen = $\frac{14 \times 20 \times 100}{1000 \times 0.5} = 56.0\%$

Q84

3.6 g of an oxide of metal on reduction with hydrogen formed 3.2 g of metal. If the vapour density of metal is 32, the simplest formula of the oxide would be

- 1) MO 2) M_2O_3 3) M_2O 4) M_2O_5

ANSWER

As we know that

$$\text{Equivalent weight of metal} = \frac{\text{weight of metal}}{\text{weight of oxygen}} \times 8$$

$$= \frac{32}{0.4} \times 8 = 64$$

$$\text{Vapour density} = \frac{\text{mol. wt}}{2}$$

$$\text{Mol. wt} = 2 \times V.D = 2 \times 32 = 64$$

$$\text{As we know that } n = \frac{\text{mol. wt}}{\text{eq. wt}} = \frac{64}{64} = 1$$

Suppose, the formula of metal oxide be M_2O_n . Hence the formula of metal oxide = M_2O .

Q85

4 g of copper was dissolved in concentrated nitric acid. The copper nitrate solution on strong heating gave 5 g of its oxide. The equivalent weight of copper is

- 1) 23.0 2) 32.0 3) 12.0 4) 20.0

ANSWER

wt. of oxygen = wt. of oxide - wt. of copper

$$= 5 - 4$$

$$= 1$$

$$\frac{W_{Cu}}{W_O} = \frac{E_{Cu}}{E_O}$$

$$\frac{4}{1} = \frac{E_{Cu}}{8} \Rightarrow E_{Cu} = 32$$

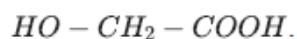
Q86

Monomer present in PGA is

- 1) $HO - CH_2 - COOH$ 2) $HOCH_2 - CH_2OH$ 3) $HOOC - CH_2 - COOH$ 4) $NH_2 - CH_2 - COOH$

ANSWER

PGA is polyglycolic acid whose monomer is glycolic acid which is α -hydroxyacetic acid



Q87

The polymer used for making contact lenses is

- 1) Polymethylmethacrylate 2) Polyethelene 3) Polyethylacrylate 4) Nylon-6

ANSWER

Also known as PMMA. It is a transparent, excellent light transmitter and its optical clarity better than glass so it is used in the preparation of lenses for eyes.

Q88

The optically inactive amino acid is

- 1) Lysine 2) Glycine 3) Arginine 4) Alanine

ANSWER

Glycine H_2NCH_2COOH is the only optically inactive amino acid

Q89

Of the following statements about enzymes which ones are true

- (i) Enzymes lack in nucleophilic groups
(ii) Enzymes are highly specific both in binding chiral substrates and in catalyzing their reactions
(iii) Enzymes catalyse chemical reactions by lowering the activation energy
(iv) Pepsin is a proteolytic enzyme

- 1) (i) and (iv) 2) (i) and (iii) 3) (ii), (iii) and (iv) 4) (i)

ANSWER

Of the following statements about enzymes are true

Conceptual : - ii, iii, iv statements are correct

Q90

Starch is converted into maltose by the

- 1) Maltase 2) Invertase 3) Zymase 4) Diastase

ANSWER

Diastase enzyme converts starch into maltose.

Q91

The first antibiotic discovered was

- | | | | |
|---------------|------------------|------------------|-----------------|
| 1. Penicillin | 2. Chloromycetin | 3. Cephalosporin | 4. Streptomycin |
|---------------|------------------|------------------|-----------------|

Q92

Which one of the following enzyme is secreted by yeast fermentation to produce alcohol?

- | | | | |
|------------|--------------|-----------|------------------|
| 1. Enolase | 2. Invertase | 3. Zymase | 4. Dehydrogenase |
|------------|--------------|-----------|------------------|

Q93

Following is used in the production of leavened bread

- | | | | |
|-----------------------|--------------------|-------------------------|----------------------|
| 1. <i>Aspergillus</i> | 2. <i>Rhizopus</i> | 3. <i>Saccharomyces</i> | 4. None of the above |
|-----------------------|--------------------|-------------------------|----------------------|

Q94

Ganga and Yamuna action plan is initiated by

- | | |
|---------------------------------------|----------------------------|
| 1. Ministry of Environment and Forest | 2. Ministry of Agriculture |
| 3. Ministry of Wild-life Conservation | 4. None of the above |

Q95

Integrated Pest Management (IPM) discourages the excessive use of

- | | | | |
|-----------------------|------------------------|----------------------|------------------|
| 1. Biological methods | 2. Chemical pesticides | 3. Mechanical method | 4. None of these |
|-----------------------|------------------------|----------------------|------------------|

Q96

Which form grows symbiotically in the leaves of biofertilizer water fern?

- | | | | |
|---------------------|----------------------|-----------------------|--------------------|
| 1. <i>Rhizobium</i> | 2. <i>Klebsiella</i> | 3. <i>Clostridium</i> | 4. <i>Anabaena</i> |
|---------------------|----------------------|-----------------------|--------------------|

Q97

Maximum alcohol will be obtained from

- | | | | |
|---------|--------------|------------|----------|
| 1. Wood | 2. Sugarcane | 3. Tapioca | 4. Maize |
|---------|--------------|------------|----------|

Q98

Biogas contains

- | | | | |
|---------------------------|------------------------------|---------------------------|----------------------------------|
| 1. 50-70% CH ₄ | 2. Traces of CH ₄ | 3. 30- 40%CH ₄ | 4. C ₂ H ₆ |
|---------------------------|------------------------------|---------------------------|----------------------------------|

Q99

Streptokinase which is used as 'clot buster' obtained from

- | | | | |
|-------------------------|--------------------------|-------------------------|-------------------------|
| 1. <i>Streptococcus</i> | 2. <i>Staphylococcus</i> | 3. <i>Lactobacillus</i> | 4. <i>Saccharomyces</i> |
|-------------------------|--------------------------|-------------------------|-------------------------|

Q100

LAB are useful in

- | | |
|-----------------------|---------------------------------------|
| 1. Biocontrol | 2. Production of biogas from cow dung |
| 3. Recycling elements | 4. Production of curd from milk |

Q101

Which of the following is/ are useful as single cell proteins?

- | | |
|-------------------------|--|
| 1. <i>Pinnularia</i> | 2. <i>Spirulina</i> |
| 3. <i>Methylophilus</i> | 4. <i>Spirulina</i> and <i>Methylophilus</i> |

Q102

Which of the following is correctly matched?

- | | |
|-------------------------------------|-------------------------------------|
| 1. <i>Streptomyces</i> - antibiotic | 2. <i>Rhizobium</i> - biofertilizer |
| 3. <i>Spirulina</i> -SCP | 4. All of these |

Q103

Root nodules for nitrogen fixation of a non leguminous plant possess

- | | | | |
|-------------------|---------------------|-----------------------|------------------------|
| 1. <i>Frankia</i> | 2. <i>Rhizobium</i> | 3. <i>Azotobacter</i> | 4. <i>Thiobacillus</i> |
|-------------------|---------------------|-----------------------|------------------------|

Q104

Enzyme required for nitrogen fixation is

- | | |
|-----------------|----------------------------|
| 1. Nitrogenase | 2. Glutamate dehydrogenase |
| 3. Transaminase | 4. Transferase |

Q105

A toxic protein delta endotoxin is insecticidal and is produced by

- | | | | |
|-------------------------|-------------------|----------------------------------|----------------------|
| 1. <i>Agrobacterium</i> | 2. <i>Frankia</i> | 3. <i>Bacillus thuringiensis</i> | 4. <i>Salmonella</i> |
|-------------------------|-------------------|----------------------------------|----------------------|

Q106

In rice fields, which of the following increases soil fertility?

- | | | | |
|--------------------|--------------------------|---------------------|-----------------------|
| 1. <i>Anabaena</i> | 2. <i>Ferrobacterium</i> | 3. <i>Rhizobium</i> | 4. <i>Clostridium</i> |
|--------------------|--------------------------|---------------------|-----------------------|

Q107

When a natural predator (living being) is applied on the other pathogen organism to control them, process is called

- | | | | |
|-----------------------|------------------------|-----------------------|-----------------------|
| 1. Biological control | 2. Genetic engineering | 3. Artificial control | 4. Chemical technique |
|-----------------------|------------------------|-----------------------|-----------------------|

Q108

The use of pesticides is generally not recommended now-a-days because, pesticides

- | | |
|-------------------------------------|---------------------------------------|
| 1. Damage plant leaves | 2. Damage plant roots |
| 3. Kill insects that feed on plants | 4. Kill insects that pollinate plants |

Q109

Bacillus thuringiensis (Bt) strains have been used for designing novel

- | | |
|--------------------------------|----------------------------------|
| 1. Biofertilizer | 2. Bio- metallurgical techniques |
| 3. Bio- mineralisation process | 4. Bio- insecticidal plants |

Q110

Integrated pest management programme (IPM) emphasizes on

- | | |
|-----------------------|------------------------|
| 1. Biological control | 2. Confusion technique |
| 3. Pesticides | 4. None of these |

Q111

Blue-green algae are chiefly used as fertilizer in

- | | | | |
|----------|----------|------------|---------|
| 1. Wheat | 2. Paddy | 3. Mustard | 4. Gram |
|----------|----------|------------|---------|

Q112

Find the odd one out- streptomycin, penicillin, tetracycline, lipase

- | | | | |
|-----------------|---------------|-----------------|-----------|
| 1. Streptomycin | 2. Penicillin | 3. Tetracycline | 4. Lipase |
|-----------------|---------------|-----------------|-----------|

Q113

. Microbes, a diverse group that includes all the following except

- | | | | |
|-------------|---------------|----------|-----------|
| 1. Bacteria | 2. Protozoans | 3. Fungi | 4. Mosses |
|-------------|---------------|----------|-----------|

Q114

. The large vessels used for growing microbes in large scale, for obtaining products on industrial scale are

- | | | | |
|---------------|---------------|------------------|--------------|
| 1. Fermenters | 2. Fermentors | 3. Biogas vessel | 4. Petridish |
|---------------|---------------|------------------|--------------|

Q115

. Bacterium commonly found in human intestine

- | | | | |
|------------------------------|----------------------------|-------------------------------|---------------------------|
| 1. <i>Bacillus anthracis</i> | 2. <i>Escherichia coli</i> | 3. <i>Helicobacter pylori</i> | 4. <i>Corynebacterium</i> |
|------------------------------|----------------------------|-------------------------------|---------------------------|

Q116

. *Saccharomyces cerevisiae* is employed in the production of

- | | | | |
|---------------|----------|-----------|--------------|
| 1. Antibiotic | 2. Bread | 3. Cheese | 4. All these |
|---------------|----------|-----------|--------------|

Q117

. Microbes which digest cellulose anaerobically, release

- | | | | |
|-----------|------------|-----------|-----------------|
| 1. Oxygen | 2. Methane | 3. Oxygen | 4. Both 1 and 2 |
|-----------|------------|-----------|-----------------|

Q118

. The primary treatment of waste water treatment involves the removal of

- | | | | |
|--------------------|---------|-----------------|---------------------|
| 1. Floating debris | 2. Grit | 3. Both 1 and 2 | 4. Harmful bacteria |
|--------------------|---------|-----------------|---------------------|

Q119

. Which one of the following alcoholic drinks is produced without distillation?

- | | | | |
|---------|-----------|--------|-----------|
| 1. Wine | 2. Whisky | 3. Rum | 4. Brandy |
|---------|-----------|--------|-----------|

Q120

. The vitamin whose content increases following conversion of milk into curd by lactic acid bacteria?

- | | | | |
|--------------|--------------|----------------------------|--------------|
| 1. Vitamin C | 2. Vitamin D | 3. Vitamin B ₁₂ | 4. Vitamin E |
|--------------|--------------|----------------------------|--------------|

Q121

. Exploring the molecular, genetic and species level diversity for obtaining products of economic importance is called

- | | | | |
|-------------------|----------------|-------------------|--------------|
| 1. Bioinformatics | 2. Biopharming | 3. Bioprospecting | 4. Bioethics |
|-------------------|----------------|-------------------|--------------|

Q122

. Loss of species forever from the Earth surface is :

- | | | | |
|-------------|---------------|-------------|-------------|
| 1. Deletion | 2. Extinction | 3. Invasion | 4. Endemism |
|-------------|---------------|-------------|-------------|

Q123

. Which of the following statement is correct :

1. *Parthenium* is an endemic species of our country
2. Lantana is popularly known as Carrot grass
3. African catfish is not a threat to indigenous catfishes
4. Stellar's sea cow is an extinct animal.

Q124

. Spot out the zone of our country considered as the Hot spot of biodiversity and regarded as the 'cradle of speciation'.

- | | | | |
|---------------|------------------|-------------------|-----------------------|
| 1. North east | 2. Western Ghats | 3. Deccan Plateau | 4. Eastern Himalayas. |
|---------------|------------------|-------------------|-----------------------|

Q125

. 'Rivet popper' hypothesis was given by :

1. Paul Ehrlich
2. Darwin
3. E. Wilson
4. A. Humboldt

Q126

. Which of the following forests is known as 'the lungs of the planet Earth'?

1. Taiga forests
2. Tundra forest
3. Amazon rain forest
4. Rain forests of north east India

Q127

. Which of the following is not a cause for loss of biodiversity?

1. Destruction of habitat
2. Invasion by alien species
3. Keeping animals in zoological parks
4. Over exploitation

Q128

. The term Biodiversity is related to :

1. All living animals
2. All living plants and animals
3. Living plants, animals and microbes found in natural habitats
4. All living plant

Q129

. The concept of 'hot spots' for in situ conservation is based on

1. The number of endemic and rare species
2. The number of extinct and vulnerable species
3. The habitat loss and the number of extinct species
4. The number of endemic species and habitat loss

Q130

. The active chemical drug reserpine is obtained from :

1. *Datura*
2. *Rauwolfia*
3. *Atropa*
4. *Santalum*

Q131

. Which one of the following is not a wildlife conservation project?

1. Project tiger
2. Project Elephant
3. Project dodo
4. Project Great Indian Bustard

Q132

. Which of the following is not a narrow utilitarian feature for conservation of a species?

1. Food
2. Firewood
3. Fibre
4. Pollination

Q133

. What is common to the techniques?

- i. In vitro fertilization
 - ii. Cryopreservation
 - iii. Tissue culture
 - iv. Seed bank
1. All are in situ conservation methods
 2. All are ex situ conservation methods
 3. These techniques are not used in India
 4. All are methods for conservation of extinct organisms

Q134

. What is common to *Lantana*, *Eichornia* and African catfish?

1. All are endangered species of India
2. All are extinct species
3. All are mammals found in India
4. All the species are neither threatened nor indigenous species of India

Q135

. The 'Increased diversity contributes to higher productivity' was the idea of

1. Robert May 2. David Tilman 3. Edward Wilson 4. Endemic

Q136

. India has 2.4% of world's land area but its share of the global species diversity is

1. 1.8% 2. 3.1% 3. 5.1% 4. 8.1%

Q137

. Gemplasm conservation in liquid Nitrogen is :

1. Stratification 2. Cryoprevention 3. Germification 4. Cryopreservation

Q138

. The extinction of Passenger pigeon was due to :

1. Increased number of predatory birds 2. Over exploitation by humans
3. Bird flu virus infection 4. Habitat loss

Q139

. IUCN Red List (2004) recorded the extinction of _____ species.

1. 524 2. 784 3. 500 4. 338

Q140

. Which of the following pairs of geographical areas shows maximum biodiversity in our country?

1. Sunderbans and Rann of Kutch 2. Kerala and Punjab
3. Eastern Ghats and west Bengal. 4. Eastern Himalayas and Western Ghats

Q141

. The wildlife protection act was introduction in :

1. 1972 2. 1981 3. 1986 4. 1991

Q142

. The term biodiversity was coined by :

1. Walter Rosen 2. Edward Wilson 3. Linnaeus 4. Bentham

Q143

. The only floating National Park in the world is :

1. Keibul Lamjao National Park 2. Keoladeo Ghana National Park
3. Bhitarkanika Wildlife Sanctuary 4. Yellowstone National Park

Q144

. Find the odd one

1. Wild life safari park 2. Biosphere reserves 3. National parks 4. Wild life sanctuaries

Q145

. The relationship between species richness and area is described on a Logarithmic scale by the equation:

1. $\log S = \log C - Z \log A$ 2. $\log S = \log C + Z \log A$
3. $\log C = \log S + Z \log A$ 4. $\log S = Z \log A$

Q146

. MAB stands for

1. Mammals and Birds 2. Man and Biosphere 3. Man and Biology 4. Man and Biodiversity

Q147

1. Which of the following is incorrectly matched?

- | | |
|------------------------------------|---|
| 1. Asiatic lion –Gir National Park | 2. Rhinoceros – Kaziranga National Park |
| 3. Hangul- Corbett National Park | 4. Lion tailed macaque –Western Ghats |

Q148

1. Species richness of tropics is because of

- | | |
|--|--|
| 1. Tropics have more evolutionary time | 2. Tropics relatively constant environment |
| 3. Tropics receive more solar energy | 4. All of the above |

Q149

1. Species – area relationship was provided by

- | | |
|---------------------------|------------------|
| 1. Alexander Van Humboldt | 2. Robert May |
| 3. Paul Ehrlich | 4. Edward Wilson |

Q150

1. Following are the features of a stable community

- | | |
|---|---------------------|
| 1. Resistant or resilient to occasional disturbances (Natural or Anthropogenic) | |
| 2. Not show much variation in productivity | |
| 3. Resistant to invasion by alien species | 4. All of the above |

Q151

1. In stratosphere, which of the following elements acts as a catalyst in degradation of ozone and release of molecular oxygen?

- | | | | |
|-------|-------|-----------|-----------|
| 1. Fe | 2. Cl | 3. Carbon | 4. Oxygen |
|-------|-------|-----------|-----------|

Q152

1. Which statement is incorrect about electrostatic precipitator?

- | |
|--|
| 1. Electrode wires that are maintained at several thousand volts produce corona |
| 2. Corona releases electrons |
| 3. Velocity of air between the plates must be very high |
| 4. Collecting plates are grounded, so it is used to attract the charged dust particles |

Q153

1. Pollution is any undesirable change in physical, chemical or biological characteristics of

- | | | | |
|--------|---------|------------------|-----------------|
| 1. Air | 2. Land | 3. Water or soil | 4. All of these |
|--------|---------|------------------|-----------------|

Q154

1. The problem with the use of nuclear energy is

- | | |
|-----------------------|---------------------------------------|
| 1. Accidental leakage | 2. Safe disposal of radioactive waste |
| 3. Both 1 and 2 | 4. None of these |

Q155

Which of these is incorrect about ozone depletion?

1. CFCs release 'Cl' atom which causes degradation of O_3 .
2. 'Cl' atoms act as catalyst
3. 'Cl' atoms are not consumed in the reaction
4. Ozone depletion is minimum over Antarctic region

Q156

What are the effects of air pollution on plants?

1. Growth retardation
2. Decrease in yield
3. Premature death
4. All of these

Q157

The most widely used and effective device for removing particulate matter is

1. Arrestor
2. Scrubber
3. Electrostatic precipitator
4. Converters

Q158

Catalytic converters are fitted into automobiles to reduce emission of harmful gases. Catalytic converters change unburnt hydrocarbons into;

1. Carbon dioxide and water
2. Carbon monoxide
3. Methane
4. Carbon dioxide and methane

Q159

Greenhouse gases absorb _____ radiation from the earth and emit it again towards the earth. The cycle continues till the earth's surface has no _____ radiation to emit.

1. Long wave (infrared), long wave
2. Short wave (UV), long wave
3. Long wave (infrared), short wave (UV)
4. Short wave (UV), short wave (UV)

Q160

Which one of the following pairs of gases are the major causes of 'Greenhouse effect'?

1. CO_2 and CO
2. CFCs and SO_2
3. CO_2 and N_2O
4. CO_2 and O_3

Q161

Match the items given in **Column I** with those in **Column II** and select the correct option given below:

	COLUMN I		COLUMN II
A	Eutrophication	I	UV-B radiation
B	Sanitary landfill	II	Deforestation
C	Snow blindness	III	Nutrient enrichment
D	Jhum cultivation	IV	Waste disposal

	A	B	C	D
1	III	IV	I	II
2	I	III	IV	II
3	II	I	III	IV
4	I	II	IV	III

Q162

Soil erosion occurs because of

1. Over-cultivation
2. Unrestricted grazing
3. Deforestation and poor irrigation practices
4. All of these

Q163

. World Ozone Day is celebrated on

1. 16th September 2. 21st April 3. 5th June 4. 22nd April

Q164

. According to CPCB which particulate size causes greatest harm to human health?

1. 2.5µm or less 2. 3.5µm 3. 4.5µm 4. 5.2µm or more

Q165

. According to an estimate, almost _____ per cent forests have been lost in the tropics, compared to only _____ per cent in the temperate region.

1. 40, 10 2. 60, 20 3. 40, 1 4. 20, 1

Q166

. Which one of the following is a wrong statement?

1. Most of the forests have been lost in tropical areas
2. Ozone in upper part of atmosphere is harmful to animals
3. Green house effect is a natural phenomenon
4. Eutrophication is a natural phenomenon in freshwater bodies

Q167

. The green scum seen in the freshwater bodies is

1. Blue green algae 2. Red algae 3. Green algae 4. Both 1 and 3

Q168

. As the organic matter increases in a water body, the BOD:

1. Increases 2. Decreases 3. Remains unchanged 4. Not a parameter

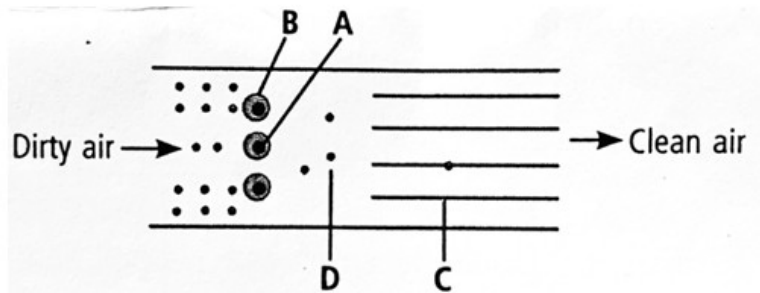
Q169

. Global warming can be controlled by

1. Increasing deforestation, reducing efficiency of energy usage
2. Reducing reforestation, increasing the use of fossil fuel
3. Increasing deforestation, slowing down the growth of human population
4. Reducing deforestation, cutting down use of fossil fuel

Q170

. Given below is a diagram of electrostatic precipitator. Identify A,B,C and D and select the correct option.



	A	B	C	D
1	Negatively charged wire	Negatively charged dust particles	Discharge corona	Collection plate
2	Negatively charged wire	Discharge corona	Collection plate	Negatively charged dust particles
3	Positively charged wire	Positively charged dust particles	Discharge corona	Collection plate
4	Positively charged wire	Discharge corona	Collection plate	Positively charged dust particles

Q171

. Which of the following statements is not true regarding algal blooms? □

1. Algal blooms are formed by excessive growth of planktonic algae
2. Growth of *Eichornia crassipes* causes coloration of water during algal blooms
3. Increased growth of algae causes depletion of O_2 in water
4. Algal blooms cause deterioration of water quality and fish mortality

Q172

. Polyblend is

1. A mixture of two different types of plastics.
2. A blend of plastic and bitumen
3. A fine powder of recycled modified plastic.
4. None of these

Q173

. Which international treaty was signed in 1987 (effective in 1989) to control the emission of ozone depleting substances?

1. Kyoto protocol
2. Earth summit
3. Montreal Protocol
4. All of these

Q174

. _____ is a major cause for atmospheric pollution in metro cities.

1. Factory
2. Automobiles
3. Smoking
4. Thermal power plant

Q175

. Read the given statements and select the correct option.

Statement 1: Average temperature of Earth has increased by 0.6°C during past century

Statement 2: There has been a progressive increase in the use of fossil fuels generating more greenhouse gases

1. Both statements 1 and 2 are correct.
2. Statement 1 is correct but statement 2 is incorrect
3. Statement 1 is incorrect but statement 2 is correct
4. Both statements 1 and 2 are incorrect

Q176

. Which of the following statements are incorrect regarding the Euro III norms?

1. It stipulates that sulphur be controlled at 350 ppm in diesel
2. It stipulates that sulphur be controlled at 150 ppm in petrol
3. Aromatic hydrocarbons are to be contained at 42% of the concerned fuel
4. None of these

Q177

The highest DDT concentration in aquatic food chain shall occur in;

1. Crab
2. Eel
3. Phytoplankton
4. Seagull

Q178

. Natural aging of lake depends on

1. Climatic factors
2. Size of lake
3. Nutrient content of lake
4. All of these

Q179

. Internationally, it has been recognized that desertification is a major problem nowadays, particularly due to;

1. Over grazing
2. Over cultivation
3. Increased urbanisation
4. Water logging

Q180

. Which of the following actions can be taken to control noise pollution?

1. Delimitation of horn-free zone around hospitals and schools
2. Permissible sound levels of crackers and of loudspeakers
3. Set the timings after which loudspeakers cannot be played
4. All of these

ANSWERS

UNIT NO: B-18 ANSWER KEY



Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
91	1	92	3	93	3	94	1	95	2
96	4	97	2	98	1	99	1	100	4
101	4	102	4	103	1	104	1	105	3
106	1	107	1	108	4	109	4	110	1
111	2	112	4	113	4	114	2	115	2
116	2	117	2	118	3	119	1	120	3
121	3	122	2	123	4	124	4	125	1
126	3	127	3	128	3	129	4	130	2
131	3	132	4	133	2	134	4	135	2
136	4	137	4	138	2	139	2	140	4
141	1	142	1	143	1	144	1	145	2
146	2	147	3	148	4	149	1	150	4
151	2	152	3	153	4	154	3	155	4
156	4	157	3	158	1	159	1	160	3
161	1	162	4	163	1	164	1	165	3
166	2	167	4	168	1	169	4	170	2
171	2	172	3	173	3	174	2	175	1
176	4	177	4	178	4	179	3	180	4