

SHIKSHA CLASSES, BHANDARA

TEST-10

CHEMISTRY , PHYSICS, BIOLOGY

Time : - 3 Hours

Max. Marks:- 720

Date :

INSTRUCTIONS :

1. The test is of 3 hours duration.
2. The Test Booklet consists of 180 questions. The maximum marks are 720.
3. There are three parts in the question paper A, B, C consisting of Chemistry, Physics having 45 questions each and Biology having 90 questions of equal weightage. Each question is allotted 4 (four) marks for each correct response. $\frac{1}{4}$ (one fourth) marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.
4. There is only one correct response for each question. Filling up more than one response in each question will be treated as wrong response and marks for wrong response will be deducted accordingly.

SYLLABUS

CHEMISTRY : POLYMERS, BIOMOLECULES, CHEMISTRY IN EVERYDAY LIFE

PHYSICS : ELECTRONIC DEVICES

BIOLOGY : ECOLOGY : ORGANISMS AND POPULATIONS, ECOSYSTEM, BIODIVERSITY AND CONSERVATION, ENVIRONMENTAL ISSUES.

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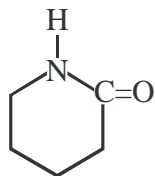
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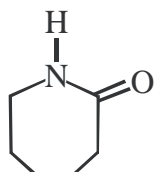
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PART A – CHEMISTRY
PART A – CHEMISTRY

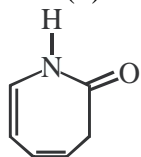
Q.1 Which of the following is monomer of Nylon-6.



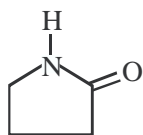
(1)



(2)



(3)



(4)

Q.2 D-glucose and L-glucose are :-

- (1) Diastereomers (2) Enantiomers
(3) Epimer (4) Anomers

Q.3 C₄-epimer of glucose is :-

- (1) Allose (2) Mannose
(3) Galactose (4) Fructose

Q.4 Glucose gives positive test with :-

- (1) Tollen reagent (2) Fehling solution
(3) Benedict solution (4) All of these

Q.5 The fibre obtained by the condensation of hexamethylene diamine and adipic acid is:

- (1) Dacron (2) Nylon 6,6
(3) Rayon (4) Teflon

Q.6 Which of the following polymer contains H-bonding?

- (1) Natural Rubber (2) Teflon
(3) Nylon - 66 (4) Polystyrene

Q.7 Which amino acid does not contain chiral centre:-

- (1) Valine (2) Leucine
(3) Glycine (4) Isoleucine

Q.8 Which is condensation polymer :-

- (1) Polythene (2) Styrene
(3) Bakelite (4) All of these

Q.9 D-glucose and D-fructose can be differentiated by

- (1) Fehling solution (2) Tollens reagent
(3) Benedict test (4) Br₂/H₂O

Q.10 Polymer Having amide linkage is :-

- (1) Nylon 6,6 (2) Terylene
(3) Teflon (4) Bakelite

Q.11 Glucose does not react with :-

- (1) Phenyl hydrazine (2) 2, 4-DNP
(3) CH₃-OH/H⁺ (4) HCN/OH

Q.12 Which one of the following is reducing sugar?

- (1) Starch (2) Cellulose
(3) Glycogen (4) Fructose

Q.13 Scurvy is caused due to deficiency of vitamin:-

- (1) B₂ (2) B₁₂
(3) C (4) D

Q.14 Benzene 4-hydroxy acetanilide belongs to which of the following ?

- (1) Antipyretic (2) Antacid
(3) Antiseptic (4) Antihistamine

Q.15 Which one of the following is not biopolymer?

- (1) Cellulose (2) Nylon-6
(3) Insulin (4) DNA

Q.16 $X \xleftarrow{HI} \text{Glucose} \xrightarrow{HNO_3} Y$, What are X and Y?

- (1) X-n-hexane, Y-Gluconic acid
(2) X-Gluconic acid, Y-Saccharic acid
(3) X-n-hexanol, Y-Saccharic acid
(4) X-n-hexane, Y-Saccharic acid

Q.17 Identify the pair of condensation polymers from the following

- (1) terylene and nylon-66
(2) PVC and polystyrene
(3) polyvinylether and polyisobutene
(4) neoprene and PVP

Q.18 α-D(+)- and β-D(+)-glucopyranoses are known as

- (1) epimers (2) anomers
(3) tautomers (4) enantiomers

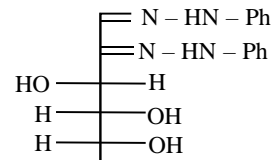
Q.19 From the following statements,

- I. Albumin is a simple protein,
II. Amino acid, alanine contains an acidic side chain,
III. Insulin is a hormone,
IV. Muscles contain the protein keratin.
Choose the wrong statements.

SPACE FOR ROUGH WORK

- (1) I, II (2) III, IV
 (3) I, III (4) II, IV
- Q.20** Which of the following may or may not be biodegradable?
 (1) Cellulose (2) Soap
 (3) Detergents (4) Sodium citrate
- Q.21** 1, 3-butadiene and styrene on polymerisation give
 (1) Bakelite (2) Terylene
 (3) Buna-S (4) Teflon
- Q.22** Choose the correct statement from the following.
 (1) All amino acids have a common isoelectric point.
 (2) All naturally occurring α -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.
- Q.23** A certain compound gives negative test with ninhydrin and positive test with Benedict's solution. The comp. is –
 (1) a protein (2) a monosaccharide
 (3) a lipid (4) an amino acid
- Q.24** Which of the following has an ester linkage?
 (1) Nylon-66 (2) Dacron
 (3) PVC (4) Bakelite
- Q.25** Which of the following pairs give positive Tollen's test?
 (1) Glucose, sucrose (2) Glucose, fructose
 (3) Hexanal, acetophenone (4) Fructose, sucrose
- Q.26** 'Natural rubber' is a polymer of
 (1) $\text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2$
 $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2 = \text{CH} - \text{C} = \text{CH}_2 \end{array}$
 $\begin{array}{c} \text{CH}_3 \text{ CH}_3 \\ | \quad | \\ \text{CH}_2 = \text{C} - \text{C} = \text{CH}_2 \end{array}$
 (2) $\text{CH}_2 = \text{CH} - \text{C} = \text{CH}_2$
 $\begin{array}{c} \text{CH}_3 \text{ CH}_3 \\ | \quad | \\ \text{CH}_2 = \text{C} - \text{C} = \text{CH}_2 \end{array}$
 (3) $\text{CH}_2 = \text{C} - \text{C} = \text{CH}_2$
 (4) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{CH}_3$

- Q.27** How many tripeptides can be prepared by linking the amino acids glycine, alanine and phenyl alanine?
 (1) One (2) Three
 (3) Six (4) Twelve
- Q.28** Hydrolysis of sucrose with dilute aq. sulphuric acid yields
 (1) 1 : 1 D-(+)-glucose; D-(-)-fructose
 (2) 1 : 2 D-(+)-glucose; D-(-)-fructose
 (3) 1 : 1 D-(-)-glucose; D-(+)-fructose
 (4) 1 : 2 D-(-)-glucose; D-(+)-fructose
- Q.29** Glycogen is –
 (1) a polymer of β -D-glucose units
 (2) a structural polysaccharide
 (3) structurally very much similar to amylopectin,
 (4) structurally similar to amylopectin but extensively branched.
- Q.30** Orlon has monomeric unit –
 (1) Acrolein (2) Glycol
 (3) Vinyl cyanide (4) Isoprene
- Q.31** Choose the correct statement –
 (i) Carbohydrates, Lipids, Proteins, Nucleic acids are the drug targets.
 (ii) 0.2% solution of phenol acts as an antiseptic while its 1% solution act as a disinfectant.
 (iii) 2-3% solution of iodine in alcohol and water is called tincture of iodine.
 (iv) Sodium lauryl sulphate is a Cationic detergents.
 (1) i, ii, iii (2) ii, iii, iv
 (3) i, iii, iv (4) i, ii, iii, iv
- Q.32** The given osazone could be obtained from.



- (1) Glucose and galactose
 (2) Glucose and mannose
 (3) Galactose and fructose
 (4) Sucrose and Galactose

SPACE FOR ROUGH WORK

Q.33 The pair of compounds in which both the compounds give positive test with Tollen's reagent is:

- (1) Glucose and Sucrose
- (2) Fructose and Sucrose
- (3) Acetophenone & Hexanal
- (4) Glucose & Fructose

Q.34 The two functional groups present in a typical carbohydrate are :

- (1) -OH and -COOH
- (2) -CHO & -COOH
- (3) >C = O and -OH
- (4) -OH and -CHO

Q.35 Glucose $\xrightarrow{\text{Br}_2 \text{ water}}$ Product is

- (1) Hexanoic acid
- (2) Gluconic acid
- (3) Saccharic acid
- (4) Bromohexane.

Q.36 Which of the following statement is correct about fructose?

- (1) It is dextrorotatory compound.
- (2) It exists in the two cyclic forms which is obtained by the addition of OH at C-5 to the >C = O group.
- (3) It exists as six membered ring.
- (4) It is named as furanose as it contain one oxygen and six carbon atom.

Q.37 Which of the following reactions of glucose can be explained only by its cyclic structure ?

- (1) Glucose forms pentaacetate.
- (2) Glucose reacts with hydroxylamine to form an oxime.
- (3) Pentaacetate of glucose does not react with hydroxylamine.
- (4) Glucose is oxidised by nitric acid to gluconic acid.

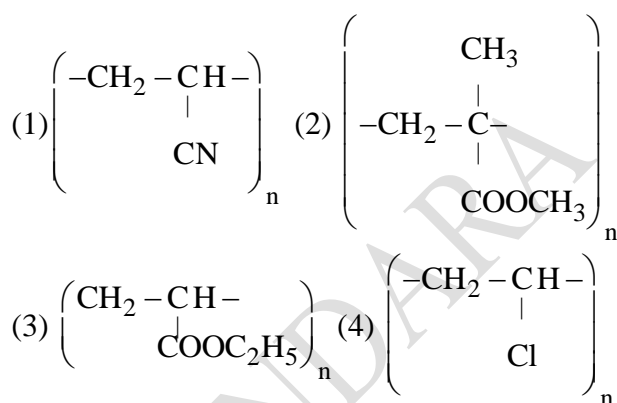
Q.38 Bakelite is obtained from phenol by reacting with

- (1) CH_3CHO
- (2) CH_3COCH_3
- (3) HCHO
- (4) $(\text{CH}_2\text{OH})_2$

Q.39 Which polymer is used in the manufacture of paints and lacquers?

- (1) Glyptal
- (2) Polypropene
- (3) Poly vinyl chloride
- (4) Bakelite

Q.40 Acrilan is a hard, horny and a high melting material. Which one of the following represents its structure?



Q.41 Nylon 6, 6 is obtained by condensation polymerisation of

- (1) Adipic acid and ethylene glycol
- (2) Adipic acid and hexamethylenediamine
- (3) Terephthalic acid and ethylene glycol
- (4) Adipic acid and phenol.

Q.42 Which of the following sets contain only addition homopolymers ?

- (1) Polythene, natural rubber, cellulose
- (2) Nylon, polyester, melamine resin
- (3) Teflon, bakelite, orlon
- (4) Neoprene, PVC, polythene

Q.43 Polyethyleneglycols are used in the preparation of which type of detergents ?

- (1) Cationic detergents
- (2) Anionic detergents
- (3) Non-ionic detergents
- (4) Soaps

Q.44 Which of the following statements is not correct about penicillin ?

- (1) Penicillin G has a narrow spectrum.
- (2) It is extracted from antibacterial fungus Penicillium.
- (3) Ampicillin and amoxycillin are synthetic modifications of penicillins.
- (4) It has bacteriostatic effect.

Q.45 What is tincture of iodine ?

- (1) 2-3% solution of iodine in alcohol-water mixture
- (2) A mixture of iodine in chloroxylenol
- (3) A mixture of 0.2% phenol and 2-3% iodine in water.
- (4) 2-3% solution of iodine in potassium iodide.

SPACE FOR ROUGH WORK

PART B – PHYSICS

Q.46 Which of the following statements is true for an N-type semiconductor :-

- (1) The donor level lies closely below the bottom of the conduction band.
- (2) The donor level lies closely above the top of the valence band.
- (3) The donor level lies at the halfway mark of the forbidden energy gap.
- (4) None of above

Q.47 Pure Si at 500 K has equal number of electron (n_e) and hole (n_h) concentrations of $1.5 \times 10^{16} \text{ m}^{-3}$. Doping by indium increases n_h to $4.5 \times 10^{22} \text{ m}^{-3}$. The doped semiconductor is of :

- (1) n-type with electron concentration $n_e = 2.5 \times 10^{23} \text{ m}^{-3}$
- (2) p-type having electron concentration $n_e = 5 \times 10^9 \text{ m}^{-3}$
- (3) n-type with electron concentration $n_e = 5 \times 10^{22} \text{ m}^{-3}$
- (4) p-type with electron concentration $n_e = 2.5 \times 10^{10} \text{ m}^{-3}$

Q.48 A transistor oscillator is (i) an amplifier with positive feedback (ii) an amplifier with reduced gain (iii) the one in which dc supply energy is converted into an output energy. Then :-

- (1) All (i), (ii) and (iii) are correct
- (2) Only (i) and (ii) are correct
- (3) Only (ii) and (iii) are correct
- (4) Only (ii) is correct

Q.49 A P-type semiconductor has acceptor levels 57meV above the valence band. The maximum wavelength of light required to create a hole is (Planck's constant $h = 6.6 \times 10^{-34} \text{ J-s}$):-

- (1) 57 \AA
- (2) $57 \times 10^{-3} \text{ \AA}$
- (3) 217100 \AA
- (4) $11.61 \times 10^{-33} \text{ \AA}$

Q.50 The dominant mechanism for motion of charge carriers in forward and reverse biased silicon P-N junction are :-

- (1) Drift in forward bias, diffusion in reverse bias

(2) Diffusion in forward bias, drift in reverse bias

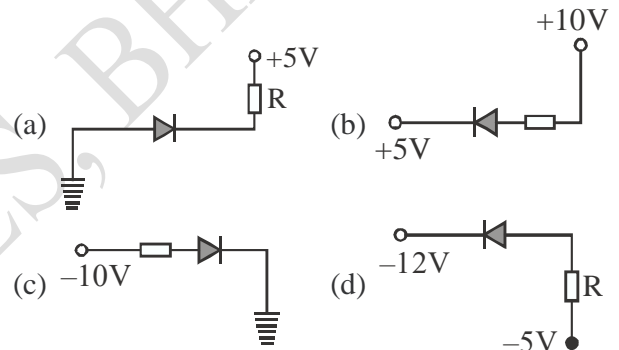
(3) Diffusion in both forward and reverse bias

(4) Drift in both forward and reverse bias

Q.51 The peak voltage in the output of a half-wave diode rectifier fed with a sinusoidal signal without filter is 10 V. The dc component of the output voltage is :-

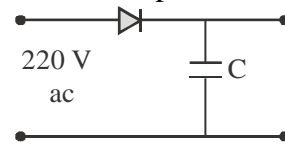
- (1) $\frac{10}{\sqrt{2}} \text{ V}$
- (2) $\frac{10}{\pi} \text{ V}$
- (3) 10 V
- (4) $\frac{20}{\pi} \text{ V}$

Q.52 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

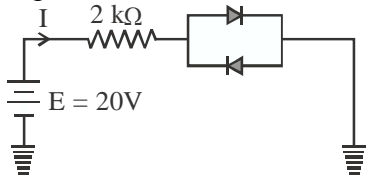
Q.53 A diode is connected to 220 V (rms) ac in series with a capacitor as shown in figure. The voltage across the capacitor is :-



- (1) 220 V
- (2) 110 V
- (3) 311.1V
- (4) $\frac{220}{\sqrt{2}} \text{ V}$

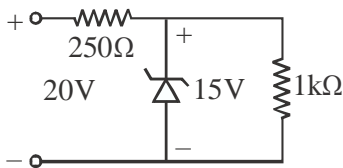
SPACE FOR ROUGH WORK

Q.54 Assuming the diodes to be of silicon with forward resistance zero, the current I in the following circuit is :-



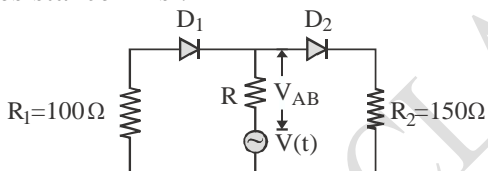
- (1) 0 (2) 9.65 mA
(3) 10 mA (4) 10.36 mA

Q.55 A zener diode, having breakdown voltage equal to 15 V, is used in a voltage regulator circuit shown in figure. The current through the diode is :-



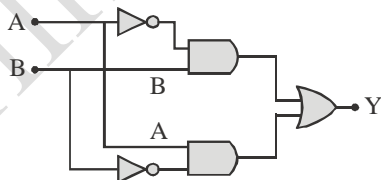
- (1) 20 mA (2) 5 mA
(3) 10 mA (4) 15 mA

Q.56 In the circuit given below, $V(t)$ is the sinusoidal voltage source, voltage drop $V_{AB}(t)$ across the resistance R is :-



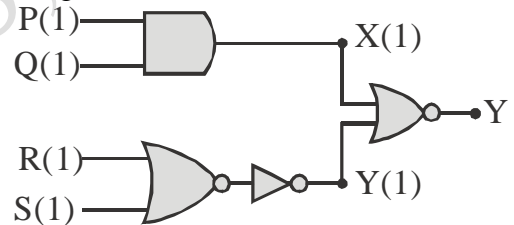
- (1) Is half wave rectified
(2) Is full wave rectified
(3) Has the same peak value in the positive and negative half cycles
(4) Has different peak values during positive and negative half cycle

Q.57 The truth table for the following logic circuit is:-



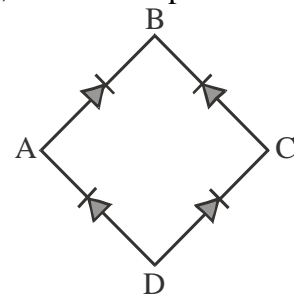
(1)	$\begin{matrix} A & B & Y \\ 0 & 0 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{matrix}$	(2)	$\begin{matrix} A & B & Y \\ 0 & 0 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 1 \end{matrix}$
(3)	$\begin{matrix} A & B & Y \\ 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{matrix}$	(4)	$\begin{matrix} A & B & Y \\ 0 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \\ 1 & 1 & 1 \end{matrix}$

Q.58 The circuit diagram shows a logic combination with the states of outputs X , Y and Z given for inputs P , Q , R and S all at state 1. When input P and R change to state 0 with inputs Q and S still at 1, the states of outputs X , Y and Z change to :-



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

Q.59 In the diagram, the input is across the terminals A and C and the output is across the terminals B and D , then the output is :



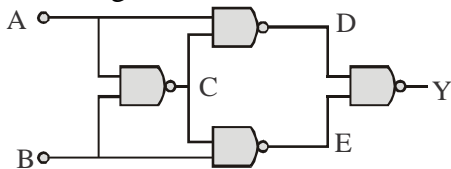
- (1) zero (2) Same as input
(3) Full wave rectifier (4) Half wave rectifier

SPACE FOR ROUGH WORK

Q.60 Avalanche breakdown in a PN junction diode is due to :-

- (1) Sudden shift to Fermi level.
- (2) Increase in the width of forbidden gap.
- (3) Sudden increase of impurity concentration.
- (4) Cumulative effect of increased electron collision and creative of added electron hole pairs.

Q.61 Truth table for system of four NAND gates as shown in figure is :-



(1)	A	B	Y
	0	0	0
	0	1	1
	1	0	1
	1	1	0

(2)	A	B	Y
	0	0	0
	0	1	1
	1	0	1
	1	1	1

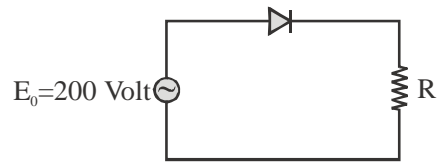
(3)	A	B	Y
	0	0	1
	0	1	1
	1	0	0
	1	1	1

(4)	A	B	Y
	0	0	1
	0	1	0
	1	0	0
	1	1	1

Q.62 The probability of electrons to be found in the conduction band of an intrinsic semiconductor at a finite temperature :-

- (1) Decreases exponentially with increasing band gap.
- (2) Increases exponentially with increasing band gap.
- (3) Decreases with increasing temperature.
- (4) Is independent of the temperature and the band gap.

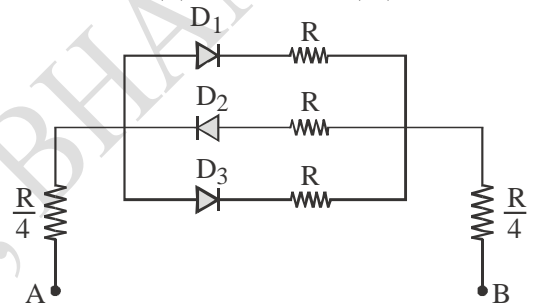
Q.63 A sinusoidal voltage of peak value 200 V is connected to a diode and resistor R in the circuit shown so that half wave rectification occurs. If the forward resistance of the diode is negligible compared to R the rms voltage across R is approximately :-



- (1) 200 V
- (2) 100 V
- (3) $\frac{200}{\sqrt{2}}$ V
- (4) 280 V

Q.64 In the following circuit PN-junction diodes D_1 , D_2 and D_3 are ideal for the following potentials of A and B.

- (i) -10V, -5V (ii) -5V, -10V (iii) -4V, -12V



The correct increasing order of resistance between A and B will be :-

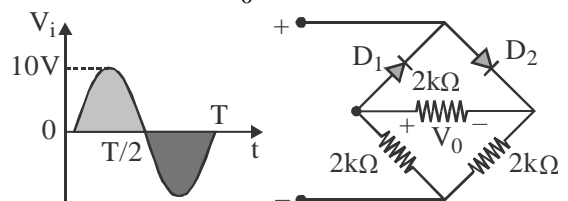
- (1) (i) < (ii) < (iii)
- (2) (iii) < (ii) < (i)
- (3) (ii) = (iii) < (i)
- (4) (i) = (iii) < (ii)

Q.65 The contribution in the total current flowing through a semiconductor due to electrons and holes are

$\frac{3}{4}$ and $\frac{1}{4}$ respectively. If the drift velocity of electrons is $\frac{5}{2}$ times that of holes at this temperature, then the ratio of concentration of electrons and holes is :-

- (1) 6 : 5
- (2) 5 : 6
- (3) 3 : 2
- (4) 2 : 3

Q.66 In the circuit shown in figure the maximum output voltage V_0 is :-



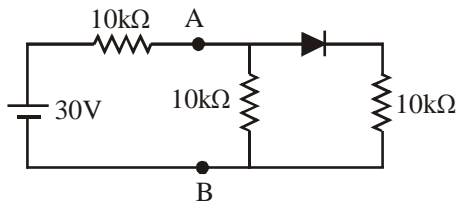
- (1) 0 V
- (2) 5 V
- (3) 2 V
- (2) 4 V

SPACE FOR ROUGH WORK

Q.67 The necessary condition in making of a junction transistor (E-emitter, B-base and C-collector)

- (1) E & B are lightly doped and C is heavily doped
- (2) E is heavily doped, B is thin and lightly doped and C is moderately doped.
- (3) E & C are lightly doped & B is thick and heavily doped.
- (4) E & B are heavily doped and C is lightly doped.

Q.68 In the given circuit, the potential difference between A and B is –



- (1) 0
- (2) 5 volt
- (3) 10 volt
- (4) 15 volt

Q.69 In a p-n junction diode, the thickness of depletion layer is 2×10^{-6} m and barrier potential is 0.3 V. The intensity of the electric field at the junction is

- (1) $0.6 \times 10^{-6} \text{ Vm}^{-1}$ from n to p side
- (2) $0.6 \times 10^{-6} \text{ Vm}^{-1}$ from p to n side
- (3) $1.5 \times 10^5 \text{ Vm}^{-1}$ from n to p side
- (4) $1.5 \times 10^5 \text{ Vm}^{-1}$ from p to n side

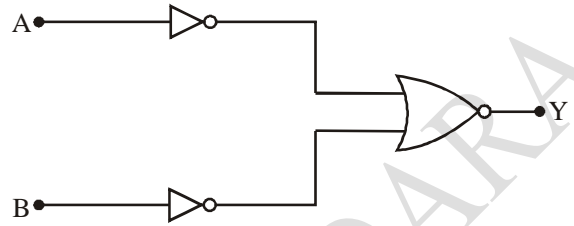
Q.70 In a transistor if $I_C/I_E = \alpha$ and $I_C/I_B = \beta$. If α varies between 20/21 and 100/101, then the value of β lies between

- (1) 1-10
- (2) 0.95-0.99
- (3) 20-100
- (4) 200-300

Q.71 An n-type semiconductor is –

- (1) neutral
- (2) positively charged
- (3) negatively charged
- (4) negatively or positively charged depending on the amount of impurity added.

Q.72 Which logic gate is represented by the following combination of logic gates?



- (1) OR
- (2) NOR
- (3) AND
- (4) NAND

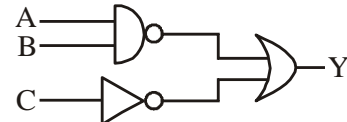
Q.73 To get an OR gate from a NAND gate, we need

- (1) Only two NAND gates
- (2) Two NOT gates obtained from NAND gates and one NAND gate.
- (3) Four NAND gates and two AND gates obtained from NAND gates.
- (4) None of the above

Q.74 A transistor circuit is used as an amplifier. When a signal is applied to the input of the transistor, the output signal is –

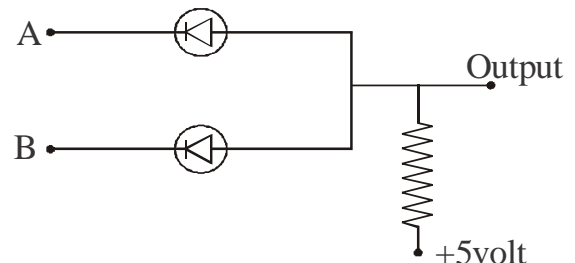
- (1) a smaller amplitude
- (2) an equal amplitude
- (3) a larger amplitude
- (4) zero amplitude

Q.75 The inputs to the digital circuit are shown. The output Y is



- (1) $A + B + \bar{C}$
- (2) $(A + B) \bar{C}$
- (3) $\bar{A} + \bar{B} + \bar{C}$
- (4) $\bar{A} + \bar{B} + C$

Q.76 In the circuit, for two inputs A and B, output is shown. The circuit will indicate



- (1) AND Gate
- (2) OR Gate
- (3) NOT Gate
- (4) NAND Gate

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Q.77 Three photo-diodes D_1 , D_2 and D_3 are made of semiconductors having band gaps of 2.8 eV, 3.3eV and 3.5 eV, respectively. Which diode will be able to detect the intensity of violet light ($\beta = 400$ nm)

- (1) D_1 (2) D_2
 (3) D_3 (4) both D_1 and D_2

Q.78 A full-wave p-n diode rectifier uses a load resistor of 1500Ω . No filter is used. The forward bias resistance of the diode is 10Ω . The efficiency of the rectifier is

- (1) 81.2% (2) 40.6%
 (3) 80.4% (4) 40.2%

Q.79 If an intrinsic semiconductor is heated, the ratio of free electrons to holes is

- (1) greater than one
 (2) less than one
 (3) equal to one
 (4) decreases and becomes zero

Q.80 For a transistor to work as an amplifier

- (1) its emitter junction is in reverse bias and collector junction is in forward bias
 (2) the transmitter must have breakdown region.
 (3) its emitter junction is in forward bias and collector junction is in reverse bias.
 (4) its emitter and collector junctions are in forward bias.

Q.81 The breakdown in a reverse biased p-n junction diode is more likely to occur due to

- I. large velocity of the minority charge carriers if the doping concentration is small.
 II. large velocity of the minority charge carriers if the doping concentration is large.
 III. strong electric field in a depletion region if the doping concentration is small.
 IV. strong electric field in the depletion region if the doping concentration is large.

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

Q.82 In P-N junction, avalanche current flows in circuit when biasing is

- (1) Forward (2) Reverse

- (3) Zero (4) Excess

Q.83 In a PN junction photo cell, the value of photo-electromotive force produced by monochromatic light is proportional to

- (1) The voltage applied at the PN junction
 (2) The barrier voltage at the PN junction
 (3) The intensity of the light falling on the cell
 (4) The frequency of the light falling on the cell

Q.84 A diode having potential difference 0.5 V across its junction which does not depend on current, is connected in series with resistance of 20Ω across source. If 0.1 A passes through resistance then what is the voltage of the source

- (1) 1.5 V (2) 2.0 V
 (3) 2.5 V (4) 5 V

Q.85 The given truth table is of

A	0	1
X	1	0

- (1) OR gate (2) AND gate
 (3) NOT gate (4) None of above

Q.86 The electrical circuit used to get smooth dc output from a rectifier circuit is called

- (1) Oscillator (2) Filter
 (3) Amplifier (4) Logic gates

Q.87 In the circuit given, the value of the current is



- (1) 0 amp (2) 10^{-2} amp
 (3) 10^2 amp (4) 10^{-3} amp

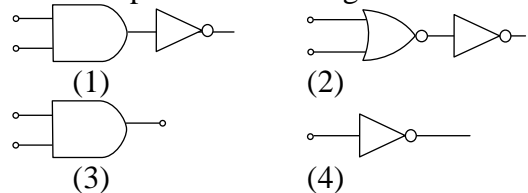
Q.88 A gate has the following truth table

P	1	1	0	0
Q	1	0	1	0
R	1	0	0	0

The gate is

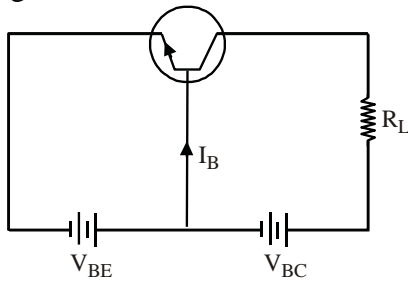
- (1) NOR (2) OR
 (3) NAND (4) AND

Q.89 Which represents NAND gate



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- Q.90** In a common-base configuration of transistor.
 $\alpha = 0.98$, $I_B = 0.02 \text{ mA}$, $R_L = 5 \text{ k}\Omega$. Output voltage across load is –



- (1) 3.2 V (2) 4.9 V
 (3) 5.2 V (4) 6.2 V

PART C – BIOLOGY

- Q.91** Which of the following is an example of Transducer:-
 (1) Phytoplanktons (2) Zooplanktons
 (3) Small Fish (4) Large Fish
- Q.92** In an ecosystem, Flow of minerals is :-
 (1) Unidirectional (2) Bidirectional
 (3) Multidirectional (4) Cyclic
- Q.93** Tree → Birds → Parasites
 The given Food chain is an example of:-
 (1) Grazing Food chain (2) Parasitic Food chain
 (3) Detritus Food chain (4) Both 2 and 3
- Q.94** Amarbel is an example of :-
 (1) Producer (2) Primary consumer
 (3) Secondary consumer (4) Top consumer
- Q.95** Which of the following pyramid shows Biotic potential of an ecosystem :-
 (1) Pyramid of Energy (2) Pyramid of Number
 (3) Pyramid of Biomass (4) Both 2 and 3 above
- Q.96** Which of the following ecosystem has all types of pyramids, upright type :-
 (1) Grassland (2) Pond
 (3) Ocean (4) Tree
- Q.97** Pyramid of Biomass shows :-
 (1) Biotic potential (2) Standing crop
 (3) Productivity (4) Standing state
- Q.98** Standing crop is expressed in terms of :-
 (1) Number (2) Dry weight
 (3) Both 1 and 2 above (4) Fresh weight

- Q.99** Amount of available biomass for consumption to Heterotrophs, is called as :-
 (1) Gross Primary Productivity
 (2) Net Primary Productivity
 (3) Net Community Productivity
 (4) Secondary Productivity
- Q.100** The reason behind low productivity of the ocean is
 (1) Nitrogen (2) Phosphorous
 (3) Magnesium (4) Both 1 and 2 above
- Q.101** Which of the following is the raw material for decomposition :
 (1) Duff (2) Humus
 (3) Detritus (4) All of the above
- Q.102** Rate of decomposition does not depends upon:
 (1) Temperature (2) Moisture
 (3) Magnesium (4) Both 1 and 2 above
- Q.103** Death of organism is the beginning of :-
 (1) Grazing Food Chain (2) Parasitic Food Chain
 (3) Detritus Food Chain (4) Both 1 and 2 above
- Q.104** Regulation is sometimes behavioural also, Example is
 (1) Kangaroo rat (2) Fish in Antarctica
 (3) Brown lizard (4) Desert lizard
- Q.105** Example of Escape in time is :-
 (1) Hibernation
 (2) Short distance migration
 (3) Long distance migration
 (4) Periodic migration
- Q.106** Which of the following statement (s) is/are correct:
 (a) Plants do not have mechanisms to maintain internal temperatures.
 (b) Very small animals are generally found in polar regions.
 (c) Mammals from colder climate generally have larger ears and limbs to minimise heat loss.
 (d) In CAM Plants, stomata remain closed during day time.
 (1) a, b and c (2) a, c and d
 (3) c and d only (4) a and d only

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Q.107 Maximum percentage of Global Carbon is contained in :-

- (1) Atmosphere (2) Ocean
(3) Fossil Fuels (4) Soil

Q.108 Match column I with column II

Column I	Column II
a. Commensalism	(i) One inhibited, other unaffected
b. Parasitism	(ii) One benefited, other unaffected
c. Mutualism	(iii) Both are benefited
d. Amensalism	(iv) One benefited, other harmed

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

Q.109 Which of the following option represents correct matching pairs :-

Ecosystem services **Percent contribution**

- (a) Soil Formation (i) 0%
(b) Nutrient cycling (ii) 50%
(c) Climate regulation (iii) 10%
(d) Dam Formation (iv) 6%
(1) a-ii, b-iii, c-iv, d-i (2) a-ii, b-iv, c-iii, d-i
(3) a-i, b-iii, c-ii, d-iv (4) a-i, b-ii, c-iii, d-iv

Q.110 Which of the following Biome are most delicate and fragile Biome :

- (1) Tropical Rain Forest
(2) Temperate deciduous Forest
(3) Tundra
(4) Taiga

Q.111 Which of the following is not the reason behind higher biodiversity in tropics :-

- (1) Long evolutionary time
(2) Less seasonal variation
(3) More fertile soil
(4) More solar availability

Q.112 Which option represents correct matching pairs

Name of Grassland	Place
(a) Prairies	(i) Russia
(b) Pampas	(ii) North America
(c) Steppes	(iii) Africa

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

Q.113 Which of the following is not the effect of Deforestation :-

- (1) Enhanced CO₂ concentration in the atmosphere
(2) Habitat destruction
(3) Prevention of soil erosion
(4) Desertification

Q.114 Concept of protecting and managing forest with the help of local communities. Introduced by Government of India, is :-

- (1) Chipko movement
(2) Social Forestry
(3) Agro Forestry
(4) Joint Forest management (JFM)

Q.115 The water prevention and control of pollution act passed in India :

- (1) 1986 (2) 1974
(3) 1968 (4) 1981

Q.116 Without green house effect the average temperature at surface of earth would be :

- (1) -18°C (2) 15°C
(3) 18°C (4) 25°C

Q.117 According to which scientist when two closely related species competing for the same resources can't co-exist long period and the competitively inferior one will be eliminated eventually ?

- (1) Mac Arthur (2) Gause
(3) Lindman (4) Connell

Q.118 Hangul or kashmir stag is being protected in :-

- (1) Kaziranga National Park
(2) Dachigam sanctuary
(3) Manas wildlife sanctuary
(4) Desert National Park

Q.119 Which of the following is not the example of in-situ conservation :-

- (1) Botanical Garden (2) Biosphere reserves
(3) Wildlife sanctuary (4) Cryopreservation

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Q.120 Rauwolfia vomitoria growing in different Himalayan ranges, are example of :-

- (1) Genetic diversity (2) Species diversity
(3) Ecological diversity (4) All of the above

Q.121 Shape of Graph showing species-area relationship on logarithmic scale is :-

- (1) Straight line (2) Rectangular hyperbola
(3) Parabola (4) Spherical

Q.122 Which of the following option represents correct matching pairs :-

Taxonomic Group	Percentage of species facing threat of extinction
-----------------	---

- | | |
|----------------|-----------|
| (a) Bird | (i) 23% |
| (b) Mammal | (ii) 31% |
| (c) Amphibia | (iii) 12% |
| (d) Gymnosperm | (iv) 32% |

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

Q.123 Succession in fresh water known as :

- (1) Hydrosere (2) Lithosere
(3) Xerosere (4) Psammosere

Q.124 Pioneer community of Lithosere is :

- (1) Phytoplankton (2) Moss
(3) Crustose lichen (4) Shrubs

Q.125 Most important cause driving Animals and Plants to extinction is :-

- (1) Habitat loss (2) Over exploitation
(3) Alien species Invasion (4) Co-Extinction

Q.126 Conservation of Biodiversity for pollination of plants, comes under :-

- (1) Narrowly utilitarian (2) Broadly utilitarian
(3) Ethical (4) All of the above

Q.127 Extinction due to catastrophs, is example of :-

- (1) Natural extinction
(2) Mass extinction
(3) Anthropogenic extinction
(4) All of the above

Q.128 In Meghalaya, last refuges for a large number of Rare and threatened plants, are :-

- (1) Biosphere reserve (2) National park
(3) Sacred groves (4) Botanical Garden

Q.129 Which of the following is not an example of Alien species :-

- (1) Carrot Grass (2) Lantana
(3) Passenger Pigeon (4) Water hyacinth

Q.130 Which of the following is not a factor that would limit the growth of a population?

- (1) Food shortage (2) Immigration
(3) Disease (4) Famine

Q.131 Which one of these is not an example of key stone species :

- (1) Mycorrhiza
(2) Fig tree in tropical forest
(3) Lion in forest
(4) Kangaroo rat in desert

Q.132 Which one is not critical link species :

- (1) Mycorrhiza
(2) Insect between plant
(3) Rabbit between grass and wolf
(4) Lion in forest

Q.133 Select incorrect statement :

- (1) Predators are not prudent in nature
(2) Predators do not over exploits their prey
(3) Predators helps in maintain species diversity
(4) Predators act as a conduit for energy flow

Q.134 Which one is not an example of echo parasite ?

- (1) Leech on cattle (2) Ticks on dog
(3) Human Lice (4) Ascaris

Q.135 Catalytic converters are fitted in to automobiles for reducing emission of poisonous gases, having expensive metals namely :

- (1) Platinum (2) Palladium
(3) Rhodium (4) 1, 2 and 3

Q.136 Which one is not an example of Endemic species :

- (1) Kiwi in New Zealand
(2) Meta sequoia in China valley
(3) Kangaroo in Australia
(4) Kangaroo rat in Desert

Q.137 Which is not a functional character of community :

- (1) Energy flow (2) Food web complexity
(3) Mineral cycle (4) Dominance

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Q.138 Which one is not a structural character of community :

- (1) Physiognomy (2) Dominance
(3) Mineral cycle (4) Organism size

Q.139 The secondary stage of lithosere is occupied by

- (1) BGA (2) Crustose lichen
(3) Moss (4) Foliose lichen

Q.140 Which of the following not causes biomagnification?

- (1) Hg (2) DDT
(3) Cd (4) SO₂

Q.141 Choose the incorrect option :

Interaction	Species-A	Species-B
(1) Mutualism	+	-
(2) Amensalism	-	0
(3) Competition	-	-
(4) Commensalism	+	0

Q.142 Which one is not an example of mutualism :

- (1) Epiphytes (2) Mycorrhiza
(3) Fig tree and wasp (4) Lichen

Q.143 In almost all Indian metropolitan cities like Delhi the major atmospheric pollutants are :

- (1) Oxides of sulphur
(2) Carbon dioxide and CO
(3) Suspended particulate matter
(4) Oxides of nitrogen

Q.144 Which of the following is an example of Partial Root Parasite ?

- (1) Santalum (2) Rafflesia
(3) Cuscuta (4) Viscum

Q.145 An association in which one organism might render the host most vulnerable to predation by making it physically weak is known as :

- (1) Parasitism (2) Predation
(3) Amensalism (4) Competition

Q.146 Climax community of hydrosere is :

- (1) Phytoplankton (2) Tree
(3) Herbs (4) Shrubs

Q.147 Select which is increase during succession ?

- (a) Species diversity
(b) Humus
(c) Net community productivity
(d) Food web complexity

- (1) only c (2) b, c
(3) c and d (4) a, b and d

Q.148 Example of secondary succession is :

- (a) Volcanic Lava (b) Fire
(c) Flood (d) Igneous rock

- (1) b, c (2) a, d
(3) a, b (4) c, d

Q.149 Select the incorrect matched :

- (i) Reiter–Father of ecology
(ii) E.Haeckel – Term ecology
(iii) A. G. Tansley–Father of ecosystem ecology
(1) i, ii and iii (2) only iii
(3) i and ii (4) only i

Q.150 Which adaptation of parasite help to sustain their life in host body ?

- (a) Loss of unnecessary sense organ
(b) High reproductive capacity
(c) Loss of digestive system
(1) a and b (2) b and c
(3) only b (4) a, b and c

Q.151 How many statement are correct ?

- (a) Brood parasitism – Social parasitism
(b) Arceuthobium – Smallest angiospermic parasite
(c) Calotropis – Cardiac glycoside secretion
(1) Only a (2) a and b
(3) b and c (4) a, b and c

Q.152 Which one is not a example of endoparasite :

- (1) Ascaris (2) Leech on cattle
(3) Liver fluke (4) Taenia

Q.153 Concentration of DDT is minimum in :

- (1) Primary consumer (2) Producers
(3) Top consumers (4) Decomposer

Q.154 Which of the following is secondary pollutant :

- (1) PAN (2) CO
(3) NO₂ (4) SO₂

Q.155 Bhopal gas tragedy is not related to ?

- (1) MIC + Water (2) EIC
(3) CO₂ (4) 2 and 3

Q.156 A scrubber in the exhaust of a chemical industrial plant removes :

- (1) Gases like SO₂
(2) Particulate matter of size 5 mm or above

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- (3) Gases like ozone and methane
 (4) Particulate matter of size 2.5 mm or less
- Q.157** Besides CH_4 and CO_2 other green house gas from agriculture are :
- (1) NO_2 (2) CFC
 (3) NH_3 (4) SO_2
- Q.158** Absence of lichen in a habitat indicates :
- (1) Zinc in soil (2) Copper in soil
 (3) CO in air (4) Air pollution
- Q.159** Study of different-different species with environment is ?
- (1) Gene ecology (2) Synecology
 (3) Physiology (4) Autecology
- Q.160** Basic unit of ecological hierarchy is ?
- (1) Organism (2) Species
 (3) Ecosystem (4) Population
- Q.161** Which is normally not an air pollutant ?
- (1) CO (2) SO_2
 (3) Hydrocarbon (4) CO_2
- Q.162** Low value of BOD (Biochemical oxygen demand) indicates
- (1) Water is highly polluted
 (2) Dissolved O_2 less
 (3) Organic matter in the water is higher
 (4) Water is pure
- Q.163** Hermit crab and sea anemone is not an example of
- (a) Proto cooperation
 (b) Non-obligatory relationship
 (c) Predation
 (d) Amensalism
- (1) Only c (2) a and b
 (3) c and d (4) b and c
- Q.164** Epizone are the example of :
- (1) Mutualism (2) Commensalism
 (3) Amensalism (4) Proto cooperation
- Q.165** Which of the following is incorrect for sewage discharge in river ?
- (1) At the discharge point BOD is high
 (2) At the discharge point DO is low
 (3) BOD decreases down stream in river
 (4) At discharge point BOD. is constant
- Q.166** During sewage treatment which biogases are not produce :
- (a) N_2 (b) O_2 (c) CH_4
 (d) H_2S (e) CO_2
- (1) a and b (2) c, d and e
 (3) only a (4) a, b and e
- Q.167** Increase in concentration of the toxicant at successive tropic levels cause :
- (1) Biomagnification
 (2) Eutrophication
 (3) Accelerated eutrophication
 (4) Algal bloom
- Q.168** Percentage land surface of world occupied by wetlands is :-
- (1) 10% (2) 6%
 (3) 18% (4) 12%
- Q.169** Which of the following statement(s) is/are correct
- (a) Among Animals, insects are the most species rich taxonomic group.
 (b) Conventional taxonomic methods are suitable for Identification of microbial species.
 (c) Speciation is generally a function of time.
 (d) The last twenty years alone have witnessed the disappearance of 27 species.
- (1) a, c and d (2) a, b and c
 (3) a, b, c and d (4) b, c and d
- Q.170** World summit on sustainable development held in Johannesburg, south Africa, in :-
- (1) 2010 (2) 1992
 (3) 1987 (4) 2002
- Q.171** Which is not related with acid rain ?
- (a) SO_2 (b) NO_2
 (c) O_3 (d) CH_4
- (1) Only a (2) Only b
 (3) c & d (4) a, b, c & d
- Q.172** For many taxonomic group, species inventories are more complete in :
- (1) Tropical region (2) Temperate region
 (3) Arctic region (4) Antarctic region

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Q.173 Contribution of India in global species diversity is :

- (1) 1.8 % (2) 2.4 %
(3) 8.1 % (4) 4.2 %

Q.174 Which of the following statement(s) is/are incorrect among the options given below :

- (a) Conventional taxonomic methods are more suitable for identifying microbial species.
(b) Species diversity increases as we move from equator towards pole.
(c) Amphibians appear to be more vulnerable to extinction.
(d) Hotspots are also regions of accelerated habitat loss.

- (1) a, b and d (2) b, c and d
(3) b and d (4) a and b

Q.175 Obligatory relationship between two organism in which both are benefited is called :-

- (1) Proto-cooperation (2) Amensalism
(3) Commensalism (4) Mutualism

Q.176 In the given list below how many areas represent the examples of secondary succession burned or cut forest, newly cooled lava, bare rock, abandoned farm land, lands that have been flooded.

- (1) Three (2) Six
(3) Two (4) Four

Q.177 What type of ecological succession would operate on newly created pond and burned or cut forest :-

- (1) Primary and secondary succession
(2) Primary succession
(3) Secondary succession
(4) Secondary and primary succession

Q.178 Mycorrhiza is an example of :-

- (1) Key-stone species
(2) Endermic species
(3) Critical link species
(4) Rare species

Q.179 Ozone layer of upper atmosphere is being destroyed by :-

- (1) Sulphurdioxide
(2) Carbondioxide
(3) Chlorofluorocarbon
(4) Smog

Q.180 Which of the following is an example of climax community during hydrosere :-

- (1) Azolla (2) Cyanobacteria
(3) Vallisneria (4) Oak

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