



Study Material Based on the
Latest **CBSE** Syllabus and **NCERT** Textbooks

Together with[®]

OBJECTIVE TYPE QUESTIONS (SCIENCE)

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CLASS
10
TERM 2

**RACHNA
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Part-I

[Multiple Choice Questions, Assertion-Reason Questions, Case-based Questions]

4

CARBON AND ITS COMPOUNDS

Multiple Choice Questions

1. The percentage of carbon dioxide in the atmosphere is
(a) 0.01% (b) 0.02% (c) 0.03% (d) 0.3%

Ans. (c)

2. The compounds which are made up of carbon are called
(a) Organic compounds (b) Inorganic compounds
(c) Metals (d) None of these

Ans. (a)

3. In free state, carbon is found in nature in the form of
(a) diamond, graphite and buckminsterfullerene
(b) coal and petroleum
(c) fats and proteins
(d) limestone, marble and chalk

Ans. (a)

4. In combined state, carbon is found in the form of
(a) carbonates, such as limestone and chalk
(b) fossil fuels, such as coal and petroleum
(c) organic compounds, such as carbohydrates
(d) All of the above

Ans. (d)

5. Which of the following is the hardest natural substance known?
(a) Coal (b) Petroleum (c) Diamond (d) Graphite

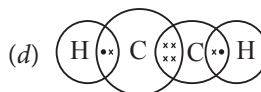
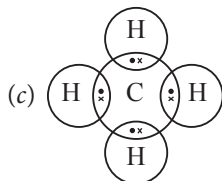
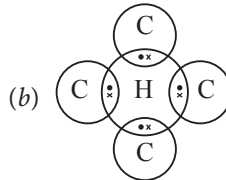
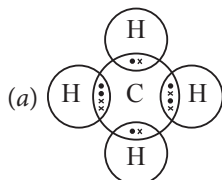
Ans. (c)

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6. The bond formed by transfer of electrons is called
 (a) Covalent bond (b) Electrovalent or ionic bond
 (c) Double bond (d) None of these

Ans. (b)

7. Which of the following is the correct electron dot structure for methane?



Ans. (c)

8. The electron dot structure for hydrogen molecule is



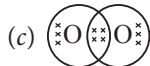
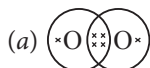
Ans. (b)

9. Which of the following is correct electron dot structure for nitrogen molecule?



Ans. (a)

10. Which of the following is correct electron dot structure for oxygen molecule?



Ans. (d)

11. Which of the following is the correct formula of ammonia?



Ans. (c)

12. The element which is found in nature in two or more forms is called a/an
 (a) isotope (b) allotrope (c) isotone (d) all of these

Ans. (b)

13. The name of the element carbon is derived from the Latin word _____ .
 (a) fossil (b) petra (c) carbo (d) none of these

Ans. (c)

14. When a piece of electrode used in a dry cell is heated strongly, it forms a gas which turns lime water milky. The electrode is made up of
 (a) diamond (b) metal (c) graphite (d) copper

Ans. (c)

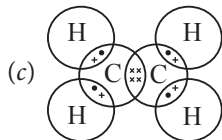
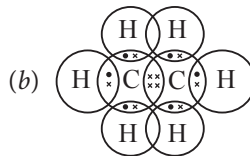
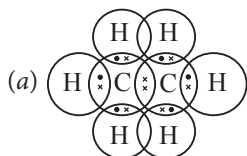
15. The hydrocarbon in which there is double bond between carbon atoms is called
 (a) alkane (b) alkene (c) alkyne (d) alkyl group

Ans. (b)

16. The hydrocarbon in which there is triple bonds between carbon atoms is called
 (a) alkane (b) alkene (c) alkyne (d) alkyl group

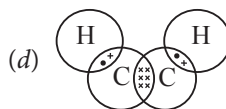
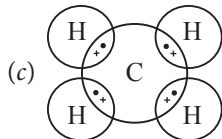
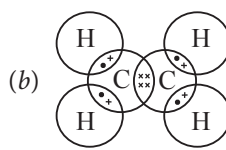
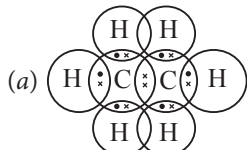
Ans. (c)

17. Which of the following is the correct electron dot structure of ethane?



Ans. (a)

18. Which of the following is the correct electron dot structure of ethene?



Ans. (b)

6 Objective Type Questions—10

19. The simplest hydrocarbon compound is

- (a) methane (b) ethane (c) propane (d) butane

Ans. (a)

20. The group formed by the removal of one hydrogen atom from an alkane molecule is called

- (a) alkene (b) alkyl (c) alkyne (d) alcohol

Ans. (b)

21. Which of the following compounds is unsaturated?

- (a) C_2H_4 (b) C_3H_8 (c) C_5H_{12} (d) CH_4

Ans. (a)

22. Which of the following compounds have double bond?

- (a) C_2H_6 (b) C_3H_4 (c) C_3H_4 (d) C_4H_{10}

Ans. (b)

23. Which of the following has triple bond?

- (a) C_2H_4 (b) C_3H_6 (c) C_3H_4 (d) CH_4

Ans. (c)

24. The hydrocarbon which is an alkyne has three carbon atoms. The molecular formula of this compound will be

- (a) C_3H_6 (b) C_3H_8 (c) C_3H_4 (d) C_3H_3

Ans. (c)

25. The unsaturated cyclic compounds are called _____ compounds.

- (a) aliphatic (b) aromatic (c) both (a) and (b) (d) None of these

Ans. (b)

26. A saturated hydrocarbon containing single bonds is called.

- (a) alkane (b) alkene (c) alkyne (d) All of these

Ans. (a)

27. A group of organic compounds having similar structures and similar chemical properties in which the successive compounds differ by CH_2 group is called

- (a) isobars (b) functional group
(c) homologous series (d) isomerism

Ans. (c)

28. An atom or a group of atoms that makes an organic compound reactive and decides its properties is called

- (a) homologous series (b) functional group
(c) heteroatom (d) isomerism

Ans. (b)

29. The group present in ethanol is

- (a) $-\text{OH}$ (b) $-\text{CHO}$ (c) $-\text{COOH}$ (d) $-\text{Cl}$

Ans. (a)

30. The homologous series of alkynes is

- (a) $\text{CH}_4, \text{C}_2\text{H}_6, \text{C}_3\text{H}_8, \text{C}_4\text{H}_{10}$ (b) $\text{C}_2\text{H}_4, \text{C}_3\text{H}_6, \text{C}_4\text{H}_8, \text{C}_5\text{H}_{10}$
 (c) $\text{C}_2\text{H}_2, \text{C}_3\text{H}_4, \text{C}_4\text{H}_6, \text{C}_5\text{H}_8$ (d) $\text{CH}_3\text{OH}, \text{C}_2\text{H}_5\text{OH}, \text{C}_3\text{H}_7\text{OH}$

Ans. (c)

31. Which of the following is not an example of a homologous series?

- (a) $\text{CH}_3\text{OH}, \text{CH}_3\text{CHO}, \text{CH}_3\text{COOH}$ (b) $\text{HCHO}, \text{CH}_3\text{CHO}, \text{C}_2\text{H}_5\text{CHO}$
 (c) $\text{HCOOH}, \text{CH}_3\text{COOH}, \text{C}_2\text{H}_5\text{COOH}$ (d) $\text{CH}_3\text{OH}, \text{C}_2\text{H}_5\text{OH}, \text{C}_3\text{H}_7\text{OH}$

Ans. (a)

32. The simplest ketone is

- (a) propanone (b) acetone (c) both (a) and (b) (d) none of these

Ans. (c)

33. The simplest carboxylic acid is

- (a) formic acid (b) acetic acid (c) ethanoic acid (d) none of these

Ans. (a)

34. The general formula of the homologous series of alcohols is

- (a) $\text{C}_n\text{H}_{2n}-\text{OH}$ (b) $\text{C}_n\text{H}_{2n+2}-\text{OH}$
 (c) $\text{C}_n\text{H}_{2n+1}-\text{OH}$ (d) $\text{C}_n\text{H}_{2n-2}-\text{OH}$

Ans. (c)

35. The general formula of the homologous series of carboxylic acids is (R = alkyl group)

- (a) $\text{R}-\text{CHO}$ (b) $\text{R}-\text{OH}$ (c) $\text{R}-\text{X}$ (d) $\text{R}-\text{COOH}$

Ans. (d)

Assertion-Reason Questions

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Assertion (A) and Reason (R) are true and R is the correct explanation of Assertion (A)
 (b) Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
 (c) Assertion (A) is true but Reason (R) is false
 (d) Assertion (A) is false but Reason (R) is true.

36. **Assertion (A):** Carbon (${}^{12}_6\text{C}$) shows tetravalency.

Reason (R): Carbon atom has four valence electrons. It can neither form C^{4-} or C^{4+} , and can only share valence electrons.

Ans. (a)

8 Objective Type Questions—10

37. Assertion (A): In N_2 , there is triple covalent bond between two nitrogen atoms.

Reason (R): Triple covalent bond is formed by sharing of six electron pairs between two bonded atoms.

Ans. (c)

38. Assertion (A): Fullerene is an isotope of carbon.

Reason (R): C-60, fullerene has carbon atoms arranged in the shape of football and this looks like the geodesic dome.

Ans. (d)

39. Assertion (A): Cyclopentane has molecular formula C_5H_{12} , with pentagonal shape.

Reason (R): Cyclopentane is an isomer of pentene.

Ans. (d)

40. Assertion (A): Butanol is the higher homologue of propane.

Reason (R): The difference in the molecular mass of two adjacent homologous is 14-u

Ans. (c)

Case-based Questions

41. Hydrocarbons are the organic compounds of carbon and hydrogen, which are obtained from coal, petroleum and natural gas. Hydrocarbons and their derivatives may be saturated, unsaturated, cyclic and aromatic. Due to their large number, in order to correlate and have a systematic study of organic compounds they have been further classified into a number of series or families known as homologous series.

(i) Which of the following is a hydrocarbon?

(a) Ethanol

(b) Ethanal

(c) Ethanoic acid

(d) Ethane

(ii) Identify unsaturated hydrocarbons amongst following.

(a) C_4H_8

(b) C_8H_{18}

(c) CH_3OH

(d) CH_3-CH_2-COOH

(iii) The formula of cyclohexane is

(a) C_6H_{14}

(b) C_6H_{12}

(c) C_6H_{10}

(d) C_6H_6

(iv) Homologous series of ketones can be represented by general formula as:

(a) $(C_nH_{2n})_2O$

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

(c) $C_nH_{2n}O$

(d) $C_nH_{2n}O_2$

(v) General formula of alkyl group is

(a) $-C_nH_{2n}$

(b) $-C_nH_{2n-2}$

(c) $-C_nH_{2n+2}$

(d) $-C_nH_{2n+1}$

Ans. (i) (d)

(ii) (a)

(iii) (b)

(iv) (c)

(v) (d)

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- (iii) Diamond, graphite and fullerene are
- (a) Isomers (b) Hydrocarbons
(c) Allotropes (d) Isosteres
- (iv) Carbon can form straight or, branches chains and rings. This property is due to
- (a) Catenation (b) Small size of carbon
(c) Tetravalency of carbon (d) Large size of carbon
- (v) Valency of carbon in Ethyne is
- (a) 1 (b) 2
(c) 3 (d) 4

Ans. (i) (b) (ii) (b) (iii) (c)
(iv) (c) (v) (d)

5

PERIODIC CLASSIFICATION OF ELEMENTS

Multiple Choice Questions

1. Matter around us are present in the form of
(a) elements (b) compounds (c) mixtures (d) All of these

Ans. (d)

2. The number of elements known to us today's is
(a) 115 (b) 110 (c) 118 (d) 100

Ans. (c)

3. Which of the following constitutes Dobereiner's triads?
(a) Hydrogen (H), Oxygen (O) and Sodium (Na)
(b) Lithium (Li), Sodium (Na) and Potassium (K)
(c) Hydrogen (H), Lithium (Li) and Magnesium (Mg)
(d) Oxygen (O), Sulphur (S) and Iron (Fe)

Ans. (b)

4. A chart of elements prepared in such a way that the elements with similar properties come in the same group is called
(a) column (b) period (c) periodic table (d) triads

Ans. (c)

5. The present basis for the classification of elements is
(a) atomic mass (b) atomic number (c) density (d) atomic radius

Ans. (b)

6. In the modern periodic table, the second periods contain
(a) 2 elements (b) 6 elements (c) 8 elements (d) 18 elements

Ans. (c)

7. There are _____ groups in the modern periodic table.
(a) 8 (b) 9 (c) 16 (d) 18

Ans. (d)

8. The first three elements of group 1 in the periodic table are
(a) Li, Na and K (b) H, Li and K (c) Li, H and Na (d) H, Li and Na

Ans. (d)

12 Objective Type Questions—10

9. The number of valence electrons in group I elements is

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

Ans. (a)

10. Which of the following is the correct electronic configuration of sodium (Na)?

- (a) 2, 8 (b) 2, 8, 1 (c) 2, 8, 2 (d) 2, 8, 7

Ans. (b)

11. The electronic configuration of lithium (Li) is

- (a) 2, 1 (b) 2, 5 (c) 2, 8, 1 (d) 2, 6

Ans. (a)

12. The number of electrons present in the outermost shell of an element or the number of electrons required to complete eight electrons in the outermost shell of an element is known as

- (a) valence electrons (b) valency (c) Both (a) & (b) (d) None of these

Ans. (b)

13. On which side of the periodic table, do you find metals?

- (a) Left side (b) Right side (c) In the middle (d) All of these

Ans. (a)

14. On which side of the periodic table, do you find non-metals?

- (a) Left side (b) Right side (c) In the middle (d) Extreme right

Ans. (b)

15. Which of the following has largest atomic size?

- (a) Li (b) Na (c) K (d) Rb

Ans. (d)

16. On moving from left to right in a period, the tendency of atoms to gain electrons

- (a) increases (b) decreases
(c) remains the same (d) None of these

Ans. (a)

17. Which of the following elements has the biggest size?

- (a) F (b) Cl (c) Br (d) I

Ans. (d)

18. Newlands' law of Octaves worked well with

- (a) Lighter elements only
(b) heavier elements only
(c) transition elements only
(d) isotopes only

Ans. (a)

19. Which of the following exists as diatomic molecules?

- (a) hydrogen (b) halogen
(c) Both (a) and (b) (d) None of these

Ans. (c)

20. The failure of Mendeleev's periodic law was

- (a) to explain the position of isotopes
(b) wrong order of the atomic masses of some elements
(c) position of hydrogen in the periodic table
(d) All of the above

Ans. (d)

21. Which of the following is/are metalloid(s)?

- (a) Arsenic (As) (b) Antimony (Sb) (c) Polonium (Po) (d) All of these

Ans. (d)

22. Which of the following is not included while discussing alkali metals?

- (a) Sodium (b) Potassium (c) Hydrogen (d) Lithium

Ans. (c)

23. For which of the following elements gaps were not left in Mendeleev's periodic table?

- (a) Sc (b) Ge (c) Ga (d) Si

Ans. (d)

24. Which of the following elements are group of metalloids?

- (a) Mg, Be, Ca (b) Si, B, Ge (c) Li, Na, K (d) F, Cl, Br

Ans. (b)

25. Consider A, B and C represent a Dobereiner's triad. If the atomic mass of element A is 40 and that of element B is 88.5, then the atomic mass of element C will be

- (a) 60 (b) 137 (c) 117 (d) 107

Ans. (b)

26. Which of the following is the correct order of increasing atomic radius?

- (a) Na < Mg < Al (b) Li < Be < B (c) F < O < N (d) P < S < Cl

Ans. (c)

27. Which of the following is the correct order of increasing metallic character?

- (a) Na < Mg < Al (b) Al < Mg < Na (c) K < Ca < Sc (d) Li < Be < B

Ans. (b)

28. Which of the following is incorrect regarding increasing order of chemical reactivity?

- (a) Na < Mg < Al (b) P < S < Cl (c) Li < Be < B (d) F < O < N

Ans. (b)

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29. Which of the following is a noble gas?

- (a) Helium (b) Argon (c) Xenon (d) All of these

Ans. (d)

30. Which of the following is not a non-metal?

- (a) Fluorine (b) Sulphur (c) Potassium (d) Phosphorus

Ans. (c)

31. An element X has atomic number 20. It belongs to

- (a) group 1 (b) group 2 (c) group 17 (d) group 18

Ans. (b)

32. Five elements A, B, C, D and E have atomic numbers 2, 4, 8, 10 and 12. The pair of inert gases are

- (a) A and B (b) B and D (c) C and D (d) A and D

Ans. (d)

33. Which of the following elements have completely filled outermost shell?

- (a) Neon (b) Krypton (c) Argon (d) All of these

Ans. (d)

34. Which of the following elements does not have eight electrons in its outermost orbit?

- (a) Neon (b) Argon (c) Helium (d) Xenon

Ans. (c)

35. Which of the following statements is incorrect?

- (a) The valency of magnesium as well as sulphur is 2.
(b) Out of Be, B, C, Li, N and O, Li is the biggest in size.
(c) Among Na, Li, Rb, Cs and K, Rb is the biggest, whereas Na is the smallest in size.
(d) Metals are electropositive elements, whereas non-metals are electronegative elements.

Ans. (c)

Assertion-Reason Questions

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Assertion (A) and Reason (R) are true and R is the correct explanation of Assertion (A).
(b) Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true.

36. **Assertion (A):** Li, Na and K constitute Dobereiners triad.

Reason (R): Triad is a group of three elements in such a manner that the average atomic mass of an element is the average of rest of the two elements.

Ans. (c)

37. Assertion (A): Mendeleev classified elements on the basis of their atomic masses.

Reason (R): Only 56 elements were known at the time of Mendeleev.

Ans. (c)

38. Assertion (A): Hydrogen occupies unique position in modern periodic table.

Reason (R): Hydrogen resembles with alkaline earth metals as well with halogens in its properties.

Ans. (c)

39. Assertion (A): Third period has eighteen elements.

Reason (R): Third shell can accommodate eighteen electrons.

Ans. (d)

40. Assertion (A): The size of noble gases is the smallest in their respective period.

Reason (R): Atomic size decreases across the period as nuclear charge increases, along the period.

Ans. (d)

Case-based Questions

41. The various properties of elements may be divided into two categories,

(i) Properties of individual atoms like valency, atomic and ionic radii and are related to their electronic configuration. (ii) Properties of the group of atoms like melting point, boiling point, heat of fusion etc and are indirectly related to their electronic configuration. All these properties which are directly or indirectly related to their electronic configuration and show a regular gradation in moving down the group or across the period are called periodic properties.

(i) Which of the following gives the correct increasing order of atomic radii of O, F and N.

(a) O, F, N

(b) N, F, O

(c) O, N, F

(d) F, O, N

(ii) Which of the following is the outer most shell for the elements of period 2.

(a) K shell

(b) L shell

(c) M shell

(d) N shell

(iii) Which of the following elements can show covalency greater than 4.

(a) Be

(b) C

(c) S

(d) B

(iv) Which of the following sets contain only isoelectronic ions.

(a) Zn^{2+} , Ca^{2+} , Ca^{3+} , Al^{3+}

(b) K^+ , Ca^{2+} , Sc^{3+} , Cl^-

(c) P^{3-} , S^{2-} , Cl^- , Na^+

(d) Ti^{4+} , Ar, Cr^{3+} , V^{5+}

(v) Valency of Boron family is

(a) 1

(b) 2

(c) 3

(d) 4

Ans. (i) (d)

(ii) (b)

(iii) (c)

(iv) (b)

(v) (c)

- (iv) Which is not the property of a period?
- (a) The physical properties of the elements are not similar.
 - (b) The chemical properties of the elements are not similar.
 - (c) The elements present do not have same atomic size.
 - (d) The elements present have same valence shell electronic configuration of atoms.
- (v) Where Would you locate the element with electronic configuration 2, 8 in modern periodic table?
- (a) Group 8
 - (b) Group 2
 - (c) Group 18
 - (d) Group 10

Ans. (i) (b) (ii) (b) (iii) (b)
(iv) (d) (v) (c)

7. The inbuilt tendency for variation during reproduction is the basis for
 (a) heredity (b) evolution
 (c) sexual reproduction (d) microbiology

Ans. (b)

8. During the process of copying the DNA, some variations are so drastic that
 (a) a new born cell divides to give rise to two cells.
 (b) a new born cell will survive and start multiplying.
 (c) the new DNA copy will work with the cellular apparatus it inherits.
 (d) the new DNA copy will not work with the cellular apparatus it inherits.

Ans. (d)

9. Yeast is a type of
 (a) bacterium (b) virus (c) protozoan (d) fungus

Ans. (d)

10. Which of the following condition is not required for the growth of bread mould on the slice of bread?
 (a) moisture (b) Dark place (c) Heat (d) cold

Ans. (c)

11. Fission is a type of
 (a) asexual reproduction (b) sexual reproduction
 (c) vegetative propagation (d) mitosis

Ans. (a)

12. Out of the following which statements are correct?
 (i) Cytokinesis is division of cytoplasm
 (ii) Cytokinesis is division of nucleus
 (iii) Karyokinesis is division of cytoplasm
 (iv) Karyokinesis is division of nucleus
 (a) (i) and (iii) (b) (i) and (iv) (c) (ii) and (iii) (d) (ii) and (iv)

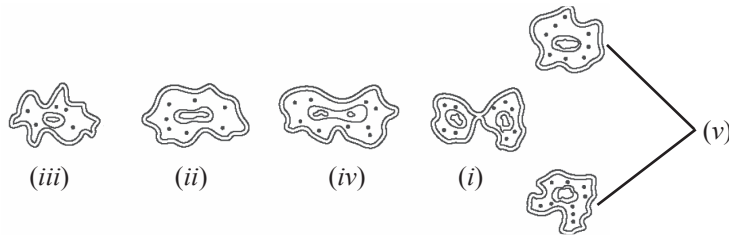
Ans. (b)

13. While studying binary fission in amoeba from a permanent slide under a microscope,
 (i) unicellular and uninucleate organisms showing irregular outline and is observed under low power.
 (ii) unicellular and uninucleate organisms showing irregular outline and is observed under high power.
 (iii) division of cells of amoeba are observed under high power.
 (iv) division of cells of amoeba are observed under low power.
 (a) (i) and (iii) (b) (i) and (iv) (c) (ii) and (iii) (d) (ii) and (iv)

Ans. (a)

20 Objective Type Questions—10

- 14.** Given below are the stages of binary fission in amoeba. Which one of the following would you select are the correct sequence?



- (a) (ii), (iii), (iv), (i), (v) (b) (iii), (iv), (i), (ii), (v)
 (c) (iii), (ii), (iv), (i), (v) (d) (iii), (iv), (ii), (i), (v)

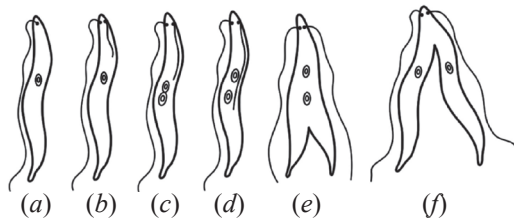
Ans. (c)

- 15.** Which of the following organism causes Kala-azar?

- (a) Amoeba (b) Planaria (c) Leishmania (d) Bacteria

Ans. (c)

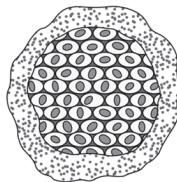
- 16.** Observe the given diagrams and identify the organism with the type of reproduction.



- (a) Binary fission in Paramecium (b) Binary fission in Leishmania
 (c) Binary fission in Planaria (d) Binary fission in Euglena

Ans. (b)

- 17.** The figure shows that a single celled organism divides into many daughter cells simultaneously by multiple fission. Identify the organism.



- (a) Paramecium (b) Amoeba (c) Plasmodium (d) Leishmania

Ans. (c)

- 18.** The water collected from a Lake or Pond that appears dark green contains

- (a) Cells of amoeba (b) Spirogyra filaments
 (c) Yeast cells (d) Hydra organism

Ans. (b)

- 19.** Most of the multicellular organisms cannot divide cell by cell. They need a complex method of reproduction as
- (a) multicellular organisms have specialized cells.
 - (b) specialised cells are organised as tissues.
 - (c) tissues are organised into organ systems which are placed at definite positions in the body.
 - (d) tissues are organised into organs which are placed at definite positions in the body.

Ans. (c)

- 20.** Which one of the following strategy is used by multicellular organisms?
- (a) Different cell types perform similar specialised functions.
 - (b) Different cell types perform different specialised functions.
 - (c) Similar cell types perform similar specialised functions.
 - (d) Similar cell types perform different specialised functions.

Ans. (b)

- 21.** The organism which does not reproduce by binary fission is
- (a) Leishmania
 - (b) Amoeba
 - (c) Paramecium
 - (d) Planaria

Ans. (d)

- 22.** The steps of the process of regeneration are given in a random order. Which of the following is the correct sequence of steps
- (i) Regeneration is carried out by specialised cells.
 - (ii) From the mass of cells, different cells undergo changes to become various cell types and tissues.
 - (iii) The specialised cells proliferate and make large number of cells.
 - (iv) The changes take place in an organised sequence referred to as development.

(a) *i, ii, iii, iv* (b) *i, iii, ii, iv* (c) *i, iv, ii, iii* (d) *i, iii, iv, ii*

Ans. (b)

- 23.** Regeneration is carried out in
- (a) hydra and yeast
 - (b) planaria and yeast
 - (c) hydra and planaria
 - (d) hydra and spirogyra

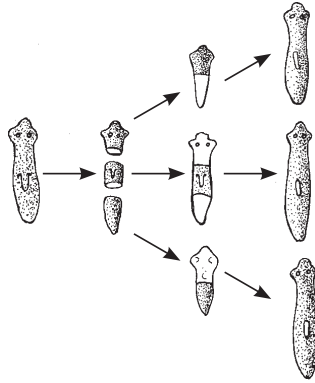
Ans. (c)

- 24.** Hydra, a multicellular organism reproduces by
- (i) budding
 - (ii) spore formation
 - (iii) fragmentation
 - (iv) regeneration
- (a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)

Ans. (d)

22 Objective Type Questions—10

25. The image of regeneration in planaria is given below:



Select the correct statement/s.

- (i) planaria reproduces sexually (ii) planaria reproduces asexually
 (iii) planaria is a unicellular organism (iv) planaria is a multicellular organism
 (a) (ii) only (b) (iv) only (c) (i) and (iii) (d) (ii) and (iv)

Ans. (d)

26. Which of the following plant does not reproduce with the help of roots?

- (a) Papaya (b) Dahlia (c) Asparagus (d) Sweet potato

Ans. (a)

27. Which of the plant do not produce viable seeds?

- (a) Banana, Pineapple, Pomegranate (b) Banana, Rose, Pomegranate
 (c) Banana, Rose, Pineapple (d) Rose, Pineapple, Lemon

Ans. (c)

28. A plant where adventitious buds on the leaves develop into new plants is

- (a) money plant (b) rose (c) bryophyllum (d) jasmine

Ans. (c)

29. Young shoots arise from the stem cuttings of

- (a) money plant, sugarcane, neem (b) rose, bougainvilla, grape
 (c) money plant, rose, peepal (d) money plant, sugarcane, rose

Ans. (d)

30. Tissue culture technique is used for

- (a) Rabi crops (b) Cash crops (c) Ornamental plants (d) Fruit trees

Ans. (c)

31. Rhizopus is a

- (a) Simple multicellular organism (b) Complex unicellular organism
 (c) Complex multicellular organism (d) Simple unicellular organism

Ans. (a)

32. Vegetative propagation is practiced for growing plants which
- | | |
|----------------------------|-------------------------------|
| (i) produce seeds | (ii) do not produce seed |
| (iii) produce viable seeds | (iv) produce non-viable seeds |
- (a) (i) and (iii) (b) (ii) and (iii) (c) (ii) and (iv) (d) (i) and (iv)

Ans. (c)

33. Amoeba and yeast are
- | | |
|---------------------------|---------------------------|
| (a) Prokaryotic organisms | (b) Fungi |
| (c) Protozoans | (d) Unicellular organisms |

Ans. (d)

Assertion-Reason Questions

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Assertion (A) and Reason (R) are true and R is the correct explanation of Assertion (A).
 (b) Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
 (c) Assertion (A) is true but Reason (R) is false.
 (d) Assertion (A) is false but Reason (R) is true.

34. **Assertion (A):** Sperm is genetically different from egg.

Reason (R): A sperm has either X or Y chromosome whereas an egg has only X chromosome.

Ans. (a)

35. **Assertion (A):** Fallen leaves of rose produce new plants.

Reason (R): In rose, vegetative propagation occurs through stem cutting.

Ans. (d)

36. **Assertion (A):** The organisms formed by asexual reproduction are considered as clones.

Reason (R): Clones grow from a single body cell of its parent and are genetically identical to the parents.

Ans. (a)

37. **Assertion (A):** Plants raised by vegetative propagation can bear flowers and fruits earlier than those raised from seeds.

Reason (R): The plants which have lost the capacity to produce seeds can be grown by vegetative propagation.

Ans. (b)

38. **Assertion (A):** The sperms enter through the vaginal passage during sexual intercourse.

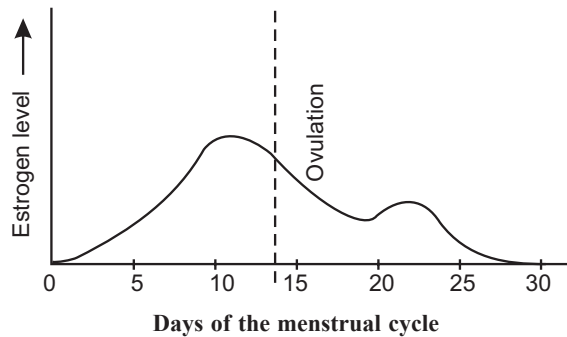
Reason (R): The sperms travel upwards and reach the uterus where they may encounter the egg and fertilization may take place.

Ans. (c)

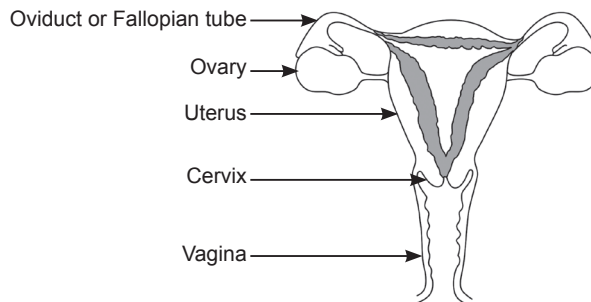
Case-based Questions

39. The female germ cells or eggs are made in the ovaries. When a girl is born, the ovaries already contains thousands of immature eggs. On reaching puberty, some of these eggs start maturing. The fertility period of human female begins at the age of puberty when one of the two ovaries starts releasing ovum. The two ovaries do not release their ova at one time. They alternatively release their ova one after the other and the period between the release of ova is generally 28-30 days. The cycle of events taking place in female reproductive organs under the control of sex hormones in every 28 days is marked by bleeding or menstrual flow. The menstrual cycle can be generally divided into three phases for understanding. The first phase in menstruation period (1st to 5th day), second phase is proliferative phase (6th to 14th day) and the third phase is secretory phase (15th to 28th day).

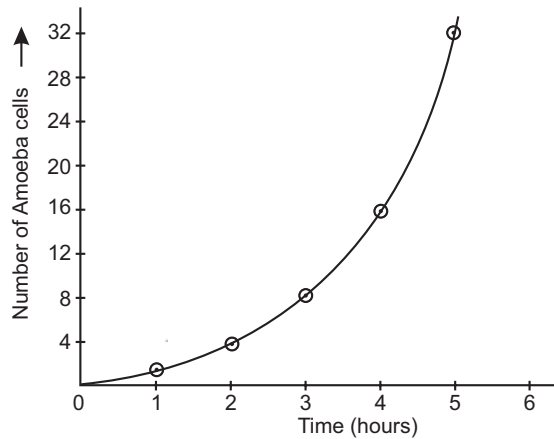
- (i) A student studies the given graph and makes some observations. Select the incorrect observation.



- (a) Release of ovum is controlled by a hormone estrogen, which is secreted in cycles.
 (b) Release of ovum is controlled by a hormone, estrogen which is secreted constantly.
 (c) Estrogen regulates maturation of only one follicle to release one ovum at a time.
 (d) Estrogen stimulates repair and development of the lining of the uterus and fallopian tube.
- (ii) Refer to the diagram of female reproductive system and find out the incorrect row.



26 Objective Type Questions—10



The number of daughter amoeba formed after 8 hours will be

- (a) 64 (b) 128
(c) 256 (d) 512
- (ii) Which of the following is the correct diagram showing an amoeba undergoing binary fission.



- (a) I (b) II
(c) III (d) IV
- (iii) Select the row which contains incorrect information.

	Name of organism	Mode of asexual reproduction
(a)	Leishmania	Multiple fission
(b)	Hydra	Budding
(c)	Planaria	Regeneration
(d)	Spirogyra	Fragmentation

- (iv) Select the incorrect statement about asexual reproduction.
- (a) Asexual reproduction involves the participation of single individual parent.
(b) In asexual reproduction new individuals are formed by the fusion of sex gametes.
(c) In asexual reproduction, all the offsprings formed are genetically identical.
(d) In asexual reproduction, the young one receives all its genes from one parent.
- (v) Which of the following unicellular organism reproduces by budding?
- (a) Ameoba (b) Hydra
(c) Yeast (d) Planaria

Ans. (i) (b) (ii) (d) (iii) (a)
(iv) (b) (v) (b)

28 Objective Type Questions—10

(III) The two copies of DNA may be identical and similar to the original.

(IV) The two copies of DNA may be similar but not identical to the original.

(a) (I) and (II)

(b) (I) and (III)

(c) only (II)

(d) (I) and (IV)

(iv) In asexual reproduction, minor variations are produced due to errors in DNA copying, but greater variations are introduced during sexual reproduction. Some reasons for a larger number of variations during sexual reproduction are given below. Select the reason which is not true for these variations during sexual reproduction?

(a) Errors in DNA copying

(b) Mitosis, during gamete formation

(c) Meiosis, during gamete formation

(d) Bringing about different characters of male and females through fusion of gametes to form zygote.

(v) DNA is present in the

(a) mitochondria

(b) cytoplasm

(c) nucleus

(d) nucleolus

Ans. (i) (c)

(ii) (a)

(iii) (d)

(iv) (b)

(v) (d)

9

HEREDITY AND EVOLUTION

Multiple Choice Questions

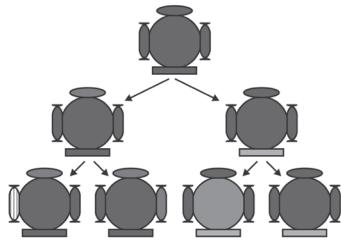
1. What do you find when you observe a sugarcane field?

- (i) Very little variations in various sugarcane plants.
- (ii) A lot of variations in various sugarcane plants.
- (iii) No variations in various sugarcane plants.
- (iv) Sugarcane plants almost look alike.

(a) (i) and (iv) (b) (ii) and (iv) (c) (iii) and (iv) (d) Only (ii)

Ans. (a)

2.



What do/does the above figure represent?

- (i) Organisms produced have similar body design.
- (ii) Organisms produced have different body design.
- (iii) Creation of diversity over succeeding generations.
- (iv) Accumulation of variations over succeeding generations.

(a) Only (iii) (b) (i) and (iii) (c) (i) and (iv) (d) (ii), (iii) and (iv)

Ans. (c)

3. Variations appear during sexual reproduction. A student arranges the following steps in a sequence. Which of the following sequence is correct?

- (i) Errors during DNA replication at the time of cell division.
- (ii) Random union of male and female gametes at the time of fertilization.
- (iii) Exchange of material between paternal and maternal chromosome during fertilization.
- (iv) Crossing over during meiosis at the time of formation of haploid gametes.

(a) i, ii, iii, iv

(b) i, iv, ii, iii

(c) i, iii, ii, iv

(d) i, iii, iv, ii

Ans. (b)

10. The first scientist who studied the inheritance of traits from one generation to the next.

- (a) Gregor Johann Mendel (b) William Bateson
(c) Charles Robert Darwin (d) August Weismann

Ans. (a)

11. Which of the following represent pure dwarf pea plants?

- (a) Tt (b) tT (c) tt (d) TT

Ans. (c)

12. A cross between two pea plants results in a genotypic ratio of 1 : 2 : 1. This is an example of a

- (a) test cross (b) reverse cross
(c) monohybrid cross (d) dihybrid cross

Ans. (c)

13. Mendel crossed a pure tall plant (TT) with a pure dwarf plant (tt). He found all the plants

- (a) tall (b) dwarf
(c) middle height (d) average height

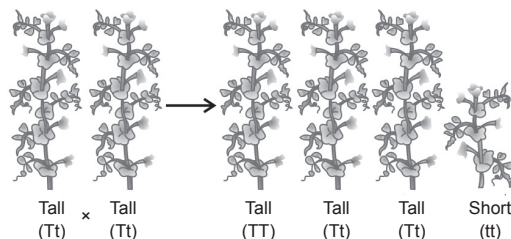
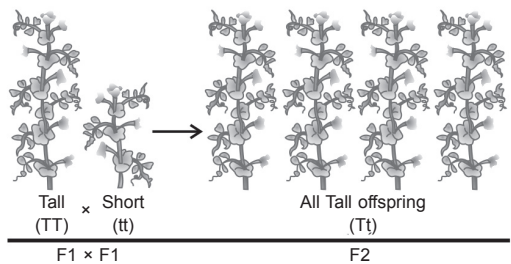
Ans. (a)

14. A cross between a tall (TT) and dwarf plant (tt) resulted in progeny that were all tall plants as

- (a) tallness is a recessive trait
(b) tallness is a dominant trait
(c) dwarfness is a dominant trait
(d) height of plant is not dependent on gene tort

Ans. (b)

15.



32 Objective Type Questions—10

Mendel crossed tall and short plants, he found all tall plants in F_1 generation. He reproduced F_1 tall plants by self pollination and found some short plants. What percentage of the plants were short?

- (a) 25% (b) 50%
(c) 75% (d) 100%

Ans. (a)

16. Mendel confirmed that the F_2 generation have a 1 : 2 : 1 ratio of TT, Tt and tt trait combinations, what would be the phenotypes of the parents at the first place?

- (a) TT and Tt (b) Tt and Tt
(c) TT and tt (d) Tt and tt

Ans. (c)

17. Mendel's experiments with tall and dwarf pea plants showed that traits may be dominant or recessive. To make the plant tall

- (a) a single copy of 't' is enough to make plant tall.
(b) a single copy of 'T' is enough to make plant tall.
(c) both copies of 'TT' have to be there for plant to be tall.
(d) both copies of tt have to be their for the plant to be tall

Ans. (b)

18. Gregor Mendel worked on pea plant and discovered the fundamental laws of inheritance. He deduced that

- (a) genes come in pairs.
(b) genes are inherited as distinct unit.
(c) genes are inherited one from each parents.
(d) the recessive gene expresses itself in the first generation.

Ans. (d)

19. In garden pea, a pure plant having round (RR) seeds is crossed with a pure plant having wrinkled seed (rr). The ratio of pure plant having round seeds to pure plant having wrinkled seeds in F_2 generation is

- (a) 1 : 1 (b) 1 : 3
(c) 3 : 1 (d) 2 : 2

Ans. (c)

20. Which of the following is not true regarding variation in species?

- (a) Variation is the basis of evolution.
(b) Selection of variants depend on environmental factors.
(c) All variation in species have equal chances of survival in the environment.
(d) Depending on the nature of variation, different individual have different kind of advantages.

Ans. (c)

21. The genotype of violet flowered plant is (WW) and that of white flowered plant is (ww). Hybrids of a cross between these two were self pollinated and obtained F₂ progeny. What will be the ratio of WW, Ww, ww plants in this progeny.

(a) WW : Ww : ww 1 : 1 : 2	(b) WW : Ww : ww 1 : 2 : 2
(c) WW : Ww : ww 1 : 2 : 1	(d) WW : Ww : ww 2 : 1 : 1

Ans. (c)

22. Which of the following is the correct name of the scientific plant on which Mendel did his experiments?

- | | |
|--------------------------|--------------------------|
| (a) <i>Pisum Sativum</i> | (b) <i>Pisum sativum</i> |
| (c) Pisum Sativum | (d) Pisum sativum |

Ans. (b)

23. The gene for blue eyes (b) is recessive to gene for brown eyes (B). The mother has blue eyes (bb) and father has brown eyes (Bb). The percentage of brown and blue eyed children will be

- | | |
|-------------|-------------|
| (a) 25 : 75 | (b) 75 : 25 |
| (c) 40 : 60 | (d) 50 : 50 |

Ans. (d)

24. A Mendelian experiment consisted of breeding tall pea plants bearing violet flowers with short pea plants bearing white flowers. The progeny all bore violet flowers, but almost half of them were short. What would be the genetic make up of the tall parent.

- | | |
|----------|----------|
| (a) TTWW | (b) ttww |
| (c) TTww | (d) TtWW |

Ans. (d)

25. If yellow and round seeded pea plant (YYRR) is cross with green and wrinkled seeded plant (yyrr), the seeds produced in F₁ generation are

- | | |
|-------------------------|----------------------|
| (a) yellow and wrinkled | (b) yellow and round |
| (c) green and wrinkled | (d) green and round |

Ans. (b)

26. Emasculation process in bisexual plants is

- (a) removal of anthers to prevent self pollination.
- (b) removal of anthers to prevent cross pollination.
- (c) removal of pistil to prevent self pollination.
- (d) removal of pistil to prevent cross pollination.

Ans. (a)

Assertion-Reason Questions

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Assertion (A) and Reason (R) are true and R is the correct explanation of Assertion (A).
- (b) Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
- (c) Assertion (A) is true but Reason (R) is false.
- (d) Assertion (A) is false but Reason (R) is true.

27. Assertion (A): Each and every child has two versions of DNA—both paternal and maternal.

Reason (R): Both the father and the mother contribute equal amounts of genetic materials to their child.

Ans. (a)

28. Assertion (A): The sex of a new born individual is always genetically determined.

Reason (R): Snails can change their sex depending on the temperature at which the fertilized eggs are kept.

Ans. (d)

29. Assertion (A): Homozygous plants whether for dominant or recessive trait have both identical genes for that trait.

Reason (R): Homozygous plants always produce similar gametes resulting in pure breeding plants.

Ans. (a)

30. Assertion (A): In human beings, males produce similar gametes.

Reason (R): Males have a pair of sex chromosomes XY and 22 pairs of autosomes.

Ans. (d)

Case-based Questions

31. It has been established that in human beings, sex is genetically determined, mothers should not be blamed for giving birth to a girl child. Also both male and female babies have equal right to live and illegal absorption of female foetus is a crime. But in some of the animals, sex determination is also controlled by the environmental factors. For examples in a turtle (*Chrysema picta*), high incubation temperature leads to the development of female offsprings. On the other hand lizard (*Agama agama*), high incubation temperature results in male progeny.

(i) Select the correct statements

- (I) In human beings, female is heterogametic as it produces two types of gametes.
- (II) In human beings, male is heterogametic as it produces two types of gametes.
- (III) In human beings, male is heterogametic whereas female is homogametic.
- (IV) In human beings female is homogametic as it produces only one type of gametes.

(a) (I) and (II)

(b) (I) and (III)

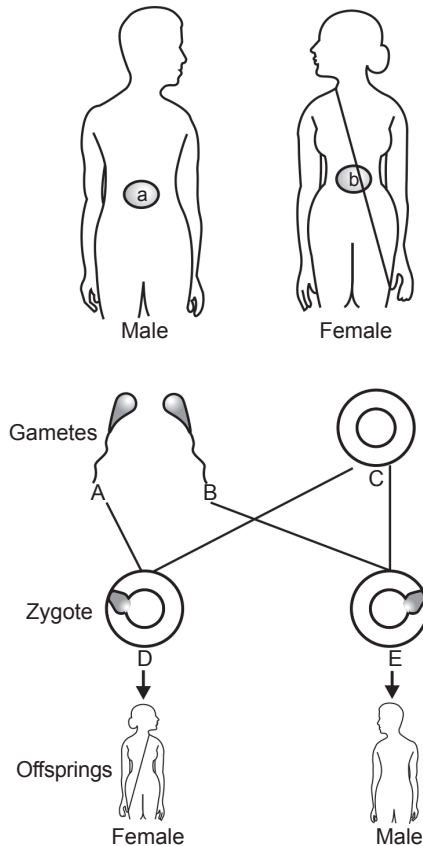
(c) (III) and (IV)

(d) (II) and (IV)

(ii) Select the incorrect statements

- (a) In human beings, sex is genetically determined.
- (b) Some animals rely entirely on environmental cues so the sex of a new born is not genetically determined.
- (c) The genes inherited from our parents decide whether we will be girls or boys.
- (d) Sex of children will be decided what they inherit from their mother.

(iii) Four students P, Q, R and S observed the given diagram, which student has identified A, B, C, D, & E correctly?



		A	B	C	D	E
(a)	P	X	X	Y	XY	XX
(b)	Q	X	Y	X	XX	XY
(c)	R	Y	Y	X	XY	XX
(d)	S	X	Y	Y	XX	XX

(iv) Human beings have 23 pairs of chromosomes. Out of which 22 pairs are autosomes and one pair is sex chromosomes. Gametes have half the number of chromosomes. Which of the following are the correct options for gametes?

12

ELECTRICITY

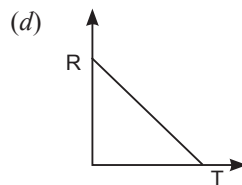
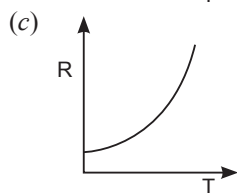
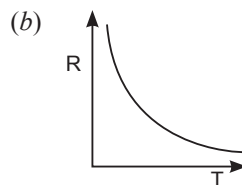
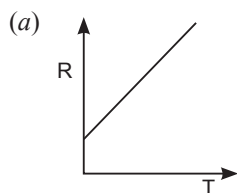
Multiple Choice Questions

1. A wire of length l , made of material with resistivity ρ is cut into two equal parts. The resistivity of the two parts are equal to

- (a) ρ (b) $\frac{\rho}{2}$ (c) 2ρ (d) 4ρ

Ans. (a)

2. The temperature of a conductor is increased. The graph best showing the variation of its resistance is



Ans. (a)

3. Two resistors are connected in series gives an equivalent resistance of $10\ \Omega$. When connected in parallel, gives $2.4\ \Omega$. Then the individual resistance are

- (a) each of $5\ \Omega$ (b) $6\ \Omega$ and $4\ \Omega$
(c) $7\ \Omega$ and $4\ \Omega$ (d) $8\ \Omega$ and $2\ \Omega$

Ans. (b)

4. At the time of short circuit, the electric current in the circuit:

[CBSE 2020]

- (a) vary continuously
(b) does not change
(c) reduces substantially
(d) increases heavily

Ans. (d)

23. When two or more resistances are connected end to end, then they are said to be connected in
 (a) series (b) parallel
 (c) both (a) and (b) (d) None of these

Ans. (a)

24. Which of the following is correct?

(a) $P = W \times t$ (b) $W = P \times t$ (c) $t = W \times P$ (d) $W = t/P$

Ans. (b)

25. The commercial unit of electrical energy used is

(a) watt (b) kilowatt (c) joule-hour (d) kilowatt-hour

Ans. (d)

26. Joule is the SI unit of

(a) power (b) energy (c) resistance (d) charge

Ans. (b)

27. Which of the following formula is not correct?

(a) $P = IR^2$ (b) $P = I^2R$ (c) $P = V^2/R$ (d) $P = V \times I$

Ans. (a)

28. Which of the following formulae is incorrect?

(a) $E = P \times t$ (b) $1 \text{ watt} = \frac{1 \text{ joule}}{1 \text{ second}}$
 (c) $1 \text{ kWh} = 3.6 \times 10^6 \text{ J}$ (d) $H = IRt$

Ans. (d)

Assertion-Reason Questions

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 (b) Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
 (c) Assertion (A) is true but Reason (R) is false.
 (d) Assertion (A) is false but Reason (R) is true.

29. **Assertion (A):** Conductors allow the current to flow through themselves.

Reason (R): They have free charge carriers.

Ans. (a)

30. **Assertion (A):** A cell converts chemical energy into electrical energy.

Reason (R): A cell maintains a potential difference across its terminals due to chemical reactions.

[KVS]

Ans. (b)

42 Objective Type Questions—10

31. Assertion (A): Alloys are preferred over metals to make electrical heating devices.

Reason (R): Metals have high resistivity as compared to their alloys.

Ans. (c)

32. Assertion (A): A change in ammeter reading occurs when we use a wire of different length and thickness between two points in a circuit.

Reason (R): When the length and thickness of a wire is changed, its resistivity changes.

Ans. (c)

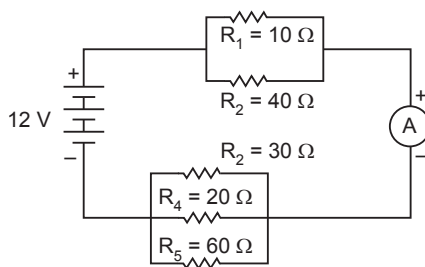
33. Assertion (A): In devices such as electric heater, iron etc., the source energy gets dissipated entirely in the form of heat.

Reason (R): A purely resistive circuit consists of a configuration of resistors only, connected to a battery.

Ans. (a)

Case-based Questions

34. In the figure, Resistors R_1 , R_2 , R_3 , R_4 and R_5 are connected in combination as shown. A 12 V battery is connected to the arrangement.



(i) If $R_1 = 10\ \Omega$, $R_2 = 40\ \Omega$, then equivalent resistance of R_1 and R_2 is

- (a) $5\ \Omega$ (b) $6\ \Omega$
(c) $8\ \Omega$ (d) $10\ \Omega$

(ii) If $R_3 = 30\ \Omega$, $R_4 = 20\ \Omega$, $R_5 = 60\ \Omega$, then overall circuit resistance is

- (a) $9\ \Omega$ (b) $18\ \Omega$
(c) $27\ \Omega$ (d) $36\ \Omega$

(iii) Total current flowing through the circuit is

- (a) $0.34\ \text{A}$ (b) $0.67\ \text{A}$
(c) $1.08\ \text{A}$ (d) $2.02\ \text{A}$

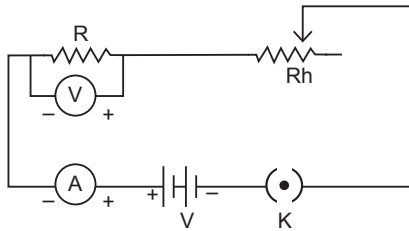
(iv) If current through R_1 and R_2 combination is I_A and current through R_3 , R_4 and R_5 combination is I_B , then

- (a) $I_A > I_B$ (b) $I_A < I_B$
(c) $I_A \leq I_B$ (d) $I_A = I_B$

- (v) When resistors are connected in parallel, the overall resistance
 (a) decreases (b) increases
 (c) first increases then decreases (d) first decreases then increases

Ans. (i) (c) (ii) (b) (iii) (b)
 (iv) (d) (v) (a)

35. Observe the following circuit diagram and answer the questions which follow:



(i) The device connected wrongly in the circuit is

- (a) (b)
 (c) (d)

(ii) The symbol '' is for a/an

- (a) rheostat (b) switch
 (c) ammeter (d) connecting wire

(iii) Symbol for device which helps to maintain potential difference in this circuit is

- (a) (b)
 (c) (d)

(iv) How does the reading on change if potential difference is increased, keeping all other factors constant?

- (a) it increases (b) it decreases
 (c) it remains unchanged (d) its' unpredictable

(v) The circuit set above should not be kept switched on for a long time if used for verification of Ohm's Law. Why.

- (a) It consumes a lot of electricity.
 (b) The resistance decreases and experiment does not give true result.
 (c) Resistance wire heats up and its resistance changes.
 (d) None of the above

Ans. (i) (b) (ii) (a) (iii) (d)
 (iv) (a) (v) (c)

13

MAGNETIC EFFECTS OF ELECTRIC CURRENT

Multiple Choice Questions

1. Magnetic effect of current was discovered by
(a) Oersted (b) Faraday (c) Bohr (d) Ampere

Ans. (a)

2. Inside the magnet, the field lines moves
(a) from north to south (b) from south to north
(c) away from south pole (d) away from north pole

Ans. (b)

3. By which instrument, the presence of magnetic field be determined?
(a) Magnetic Needle (b) Ammeter
(c) Galvanometer (d) Voltmeter

Ans. (a)

4. The factors on which one magnetic field strength produced by current carrying solenoids depends are
(a) Magnitude of current (b) Number of turns
(c) Nature of core material (d) All of the above

Ans. (d)

5. A soft iron bar is introduced inside the current carrying solenoid. The magnetic field inside the solenoid
(a) will decrease (b) will remains same
(c) will increase (d) will become zero

Ans. (c)

6. Which of the following factors affect the strength of force experience by a current carrying conductor in a uniform magnetic field?
(a) magnetic field strength
(b) magnitude of current in a conductor
(c) length of the conductor within magnetic field
(d) All of above.

Ans. (d)

7. Direction of rotation of a coil in electric motor is determined by
- fleming's right hand rule.
 - fleming's left hand rule.
 - faraday law of electromagnetic inductors.
 - None of above

Ans. (b)

8. We can induce the current in a coil by
- changing the area of the coil in a magnetic field.
 - changing the magnetic field around it.
 - changing the orientation of the coil in the magnetic field.
 - All of above

Ans. (d)

9. A magnet is moved towards a coil (i) quickly (ii) slowly. The induced potential difference
- more in (i) than in (ii) case
 - more in (ii) than in (i) case
 - same in both
 - can't say

Ans. (a)

10. Fleming's left hand and Right hand rules are used in
- Generator and electric motor
 - Electric motor and generator
 - any rule can be used for any device
 - both are not applied for generator and motor.

Ans. (b)

11. The strength of magnetic field inside a long current carrying straight solenoid is
- more at the ends than at the centre
 - minimum in the middle
 - same at all points
 - found to increase from one end to the other

[KVS]

Ans. (c)

12. Who has stated the Right hand Thumb Rule?

(a) Orsted (b) Fleming (c) Einstein (d) Maxwell

Ans. (d)

13. According to Right-hand thumb rule, the thumb indicates the direction of
- magnetic field
 - electric current
 - magnetic force
 - motion of the conductor

Ans. (b)

46 Objective Type Questions—10

14. Identify the incorrect statement : Magnetic field lines due to a current carrying circular coil is
(a) circular near the wire (b) straight along the axis
(c) in opposite direction within the loop (d) perpendicular to the plane

Ans. (d)

15. The space surrounding a magnet in which magnetic force is exerted is called a
(a) magnet (b) magnetic field
(c) magnetic compass (d) magnetic pole

Ans. (b)

16. The magnitude of magnetic field produced by a straight wire carrying current at a point is
(a) directly proportional to the current passing in the wire.
(b) inversely proportional to the current passing in the wire.
(c) directly proportional to the distance from the wire.
(d) All of the above

Ans. (a)

17. When current in a wire flows in upward direction, then magnetic field lines are in the
(a) clockwise direction (b) anticlockwise direction
(c) both directions (d) same directions always

Ans. (b)

18. The magnitude of magnetic field lines produced by a straight conductor carrying current are
(a) directly proportional to the distance of that point from the wire.
(b) inversely proportional to the distance of that point from the wire.
(c) inversely proportional to the current passing in wire.
(d) All of the above

Ans. (b)

19. When electric current flows vertically downwards, then the direction of magnetic field is
(a) clockwise
(b) anticlockwise
(c) sometime clockwise and sometime anticlockwise
(d) remains the same always

Ans. (a)

20. The magnetic field lines
(a) cross each other at 60° (b) do not cross each other
(c) cross each other at 45°
(d) sometimes cross and sometime not, as it depends on nature of magnet.

Ans. (b)

21. Observe the figure given below:



- (a) Fleming's right-hand thumb rule (b) Maxwell's left hand thumb rule
 (c) Maxwell's corkscrew rule (d) Fleming's left-hand rule

Ans. (d)

22. The strength of an electromagnet depends on

- (a) current flowing in the coil
 (b) number of turns in the coil
 (c) length of air gaps between the poles
 (d) All of the above

Ans. (d)

23. The core of an electromagnet is made of

- (a) steel (b) soft iron (c) bar magnet (d) chromium

Ans. (b)

24. If the direction of current flowing is towards west and direction of force is towards the north, then the direction of magnetic field will be

- (a) towards west (b) towards east (c) towards south (d) upwards

Ans. (d)

25. The magnitude of current induced in the coil can be increased by

- (a) winding the coil on a soft iron core. (b) increasing the number of turns.
 (c) increasing the strength of magnet. (d) All of the above.

Ans. (d)

26. Which of the following scientists, discovered the magnetic effect of current?

- (a) Fleming (b) Oersted (c) Faraday (d) Maxwell

Ans. (b)

27. Which of the following is not attracted by a magnet?

- (a) Steel (b) Nickel (c) Cobalt (d) None of these

Ans. (d)

48 Objective Type Questions—10

28. A freely suspended magnet always point in the
(a) east-west direction (b) south-east direction
(c) north-east direction (d) north-south direction

Ans. (d)

Assertion-Reason Questions

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Assertion (A) and Reason (R) are true and R is the correct explanation of Assertion (A).
(b) Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true.

29. **Assertion (A):** Strength of an electromagnet depends on the magnitude of current flowing through them.

Reason (R): Electromagnets are majorly used for lifting heavy weights.

Ans. (b)

30. **Assertion (A):** It is easier to bring North pole of a magnet to South pole of other magnet.

Reason (R): There is a force of attraction between unlike poles of magnet.

Ans. (a)

31. **Assertion (A):** The magnetic field inside a solenoid is uniform.

Reason (R): The magnetic field lines inside a solenoid are parallel.

[KVS]

Ans. (a)

32. **Assertion (A):** A magnet exerts force on a current carrying conductor kept in its field.

Reason (R): No Force acts on the magnet itself due to the conductor as its field much stronger as compared to that produced by current carrying conductor.

Ans. (c)

33. **Assertion (A):** The displacement of a current carrying rod kept in external magnetic field will be maximum when the direction of current is opposite to that of magnetic field

Reason (R): The direction of displacement is best explained through Fleming's right hand rule.

Ans. (d)

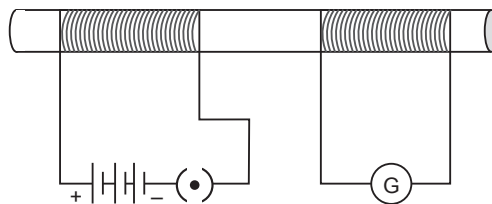
Case-based Questions

34. The space around a magnet is which the magnetic influence of the magnet can be experienced is called magnetic field. The SI unit of magnetic field is tesla (T). At any point of a current carrying circular loop, the magnetic field is given in the form of concentric circles around the loop. The circles are formed in a plane, perpendicular to the loop and become larger and larger as we move away from the loop. The direction of this magnetic field at any point is given by Right Hand Thumb Rule.

- (i) If current is flowing clockwise in a circular loop, the direction of field lines inside the loop will be
- perpendicularly out of the plane of loop
 - perpendicularly into of the plane of loop
 - directed towards north direction
 - directed towards south direction
- (ii) How does the strength of magnetic field (β) due to a current carrying circular loop of radius (r) vary with r ?
- $\beta \propto r$
 - $\beta \propto \frac{1}{r}$
 - $\beta \propto \frac{1}{r^2}$
 - $\beta \propto r^2$
- (iii) How does the strength of magnetic field (β) due to current (I) along a circular loop vary with strength of current?
- $\beta \propto I$
 - $\beta \propto \frac{1}{I}$
 - $\beta \propto \frac{1}{I^2}$
 - $\beta \propto I^2$
- (iv) Which of the following is not a property of magnetic field lines?
- These are closed continuous curves.
 - These lines move from north pole to south pole.
 - They intersect each other and perpendicular to each other.
 - Direction of field lines represents the direction of magnetic field at any point.
- (v) The field lines due to a current carrying solenoid are
- parallel inside solenoid
 - parallel outside solenoid
 - strongest at the centre of solenoid
 - weakest at the end of solenoid

Ans. (i) (b) (ii) (b) (iii) (a)
 (iv) (c) (v) (a)

35. A student set up a circuit using two coils round around a non conducting cylindrical rod. The key was inserted and later removed. The deflection produced in the galvanometer was observed and he tried to analyse the phenomenon which occurred in this process.



- (i) The phenomenon observed by the child is known as
- coil induction
 - galvanometer induction
 - electromagnetic induction
 - magnetic effect of current

Multiple Choice Questions

1. Which of the following is biodegradable?

- (a) Plastic mugs (b) Leather belts
(c) Silver foil (d) Iron nails

Ans. (b)

2. Which of the following is non-biodegradable?

- (a) Wool (b) Nylon
(c) Animal bones (d) Tea leaves

Ans. (b)

3. In an ecosystem, herbivores represent

- (a) producers (b) primary consumers
(c) secondary consumers (d) decomposers

Ans. (b)

4. A food chain comprising birds, green plants, fish and man.

The concentration of harmful chemical entering the food chain will be maximum in

- (a) green plants (b) man
(c) birds (d) fish

Ans. (b)

5. In the garden ecosystem, which of the following are producers?

- (a) Insects (b) Snakes (c) Grasses (d) Rabbits

Ans. (c)

6. Which one of the following is an artificial ecosystem?

- (a) Pond (b) Crop field (c) Lake (d) Forest

Ans. (b)

7. An ecosystem includes

- (a) all living organisms
(b) non-living objects
(c) both living organisms and non-living objects
(d) sometimes living organisms and sometimes non-living objects

Ans. (c)

14. Which one of the following microorganisms are not decomposers?

- (i) Viruses
- (ii) Bacteria
- (iii) Protozoa
- (iv) Fungi

- (a) (i) and (ii) (b) (i) and (iii) (c) (ii) and (iii) (d) (iii) and (iv)

Ans. (b)

15. Which one of the following is not a herbivore?

- (a) Cow (b) Deer (c) Giraffe (d) Dog

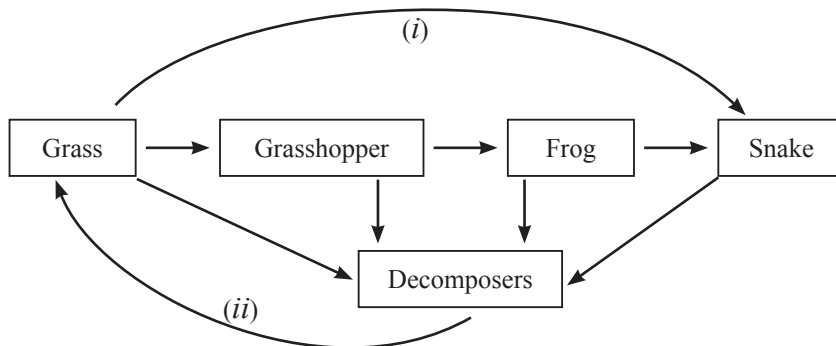
Ans. (d)

16. Which one of the following is not a consumer?

- (a) Deer (b) Raccoons (c) Mango plant (d) Fungi

Ans. (c)

17. Study the given flow diagram of food chain which depicts flow of energy and flow of matter. Select the correct option.



- (a) (i) and (ii) represent flow of energy.
- (b) (i) and (ii) represent flow of matter.
- (c) (i) represents flow of matter and (ii) represents flow of energy.
- (d) (i) represents flow of energy and (ii) represents flow of matter.

Ans. (d)

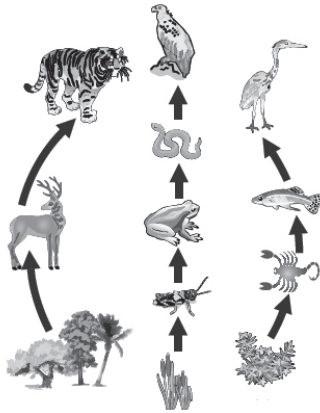
18. In an aquatic ecosystem, all the organisms are dependent on each other. Which of the following order of organisms are correct in terms of who eats whom and form a chain

- (a) Aquatic plants → Aquatic insects → Small fish → Big fish
- (b) Aquatic insects → Small fish → Big fish → Aquatic plants
- (c) Big fish → Small fish → Aquatic insects → Aquatic plants
- (d) Aquatic plants → Small fish → Aquatic insects → Big fish

Ans. (a)

54 Objective Type Questions—10

19.

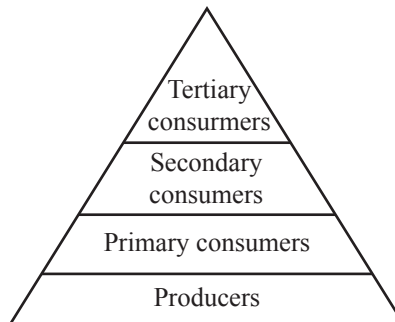


What will happen if deer is missing in the above food chain?

- (a) The population of grass decreases.
- (b) The population of tiger increases.
- (c) Tiger will start eating grass.
- (d) The population of tiger decreases and the population of grass increases.

Ans. (d)

20.



In the above food chain of frog, grass, insect, plants and snake, what would be the trophic level of frog?

- (a) First trophic level
- (b) Second trophic level
- (c) Third trophic level
- (d) Forth trophic level

Ans. (c)

21. In an ecosystem, the 10% of energy available for transfer from one trophic level to the next in the form of

- (a) physical energy
- (b) heat energy
- (c) light energy
- (d) chemical energy

Ans. (d)

22. What is the direction of flow of energy in an ecosystem?

- (a) Bidirectional
- (b) Unidirectional
- (c) Multi directional
- (d) First unidirectional then bidirectional

Ans. (b)

23. Which of the following limits the number of trophic levels?

- (a) Polluted air
- (b) Polluted water
- (c) Deficiency of food supply
- (d) Decrease in energy at higher trophic levels

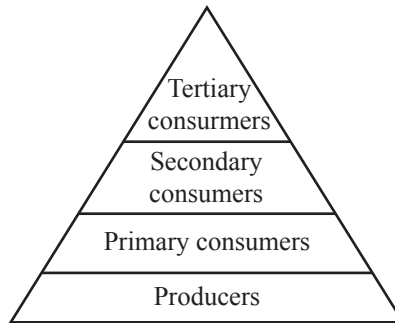
Ans. (d)

24. Various steps in a food chain are termed as

- (a) energy levels
- (b) food levels
- (c) trophic levels
- (d) matter levels

Ans. (c)

25.



Column A	Column B
(A) Producers	(i) Second trophic level
(B) Primary consumers	(ii) First trophic level
(C) Secondary consumers	(iii) Forth trophic level
(D) Tertiary consumers	(iv) Third trophic level

- (a) (A) – (ii), (B) – (i), (C) – (iv), (D) – (iii)
- (b) (A) – (i), (B) – (ii), (C) – (iii), (D) – (iv)
- (c) (A) – (ii), (B) – (iii), (C) – (i), (D) – (iv)
- (d) (A) – (iii), (B) – (ii), (C) – (i), (D) – (iv)

Ans. (a)

26. Which of the following would have the maximum concentration of chemicals?

- (a) Green plants
- (b) Deer
- (c) Cows
- (d) Human beings

Ans. (d)

56 Objective Type Questions—10

27. Ozone layer shields the surface of the earth from
(a) infrared radiations (b) light rays
(c) ultraviolet radiations (d) both infrared and ultraviolet radiation

Ans. (c)

28. Select the incorrect statement about ozone.
(a) Ozone is a triatomic molecule.
(b) Ozone is a form of oxygen.
(c) Ozone is highly poisonous.
(d) A great quantity of ozone is present in the lower part of atmosphere called troposphere.

Ans. (d)

Assertion-Reason Questions

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

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(b) Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true.

29. **Assertion (A):** All organisms such as plants, animals, microorganisms and human beings interact with the physical surroundings and maintain a balance in the nature.

Reason (R): The interaction between living components (biotic components) and non-living components (abiotic components) form an ecosystem.

Ans. (a)

30. **Assertion (A):** The number of producers are always maximum in a food chain.

Reason (R): The number of organisms in subsequent trophic levels goes on decreasing progressively.

Ans. (b)

31. **Assertion (A):** Decomposers break down the complex organic substances into simple inorganic substances that go into the soil and are used again by the plants.

Reason (R): Natural replenishment of the soil cannot take place in the absence of decomposers.

Ans. (a)

32. **Assertion (A):** Some time back, *kulhads*, disposal cups made of clay were used in the trains.

Reason (R): The usage of *kulhads* were stopped as a lot of soil is needed for making *kulhads* and results in large scale depletion of top fertile soil.

Ans. (b)

33. **Assertion (A):** We find lots of garbage around us in the towns and cities.

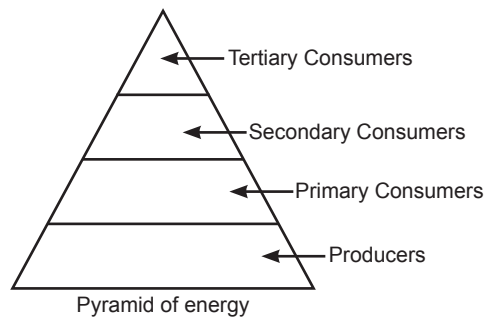
Reason (R): Improvement in our life style and changes in packaging have resulted in greater amount of waste material generation.

Ans. (a)

Case-based Questions

34. Sir Arthur G. Tansley coined the term ecosystem in 1935. Ecosystem ecology is the integrated study of biotic (living) and abiotic (non-living) components of ecosystem and their interactions. The science of ecosystem examines how the living and non-living components interact with each other. Ecosystems are parts of biomes which are climatic systems of life and organisms. There are four types of ecosystems: artificial, terrestrial, lentic and lotic. Ecosystem functioning reflects the life activities of plants, animals and microbes and their impact on the physical and chemical conditions of their environment. An ecosystem must contain producers, consumers, decomposers, dead and inorganic matter. All ecosystems require energy from an external source—the sun.

- (i) Most of the ecosystems in the world are natural ecosystems but some of them are man-made ecosystems or artificial ecosystems. Select which one of the following is true for man-made ecosystems.
- Crop-field, garden, grassland, forest
 - Crop-field, pond, aquarium, mountain
 - Aquarium, park, garden, aquarium
 - Grassland, forest, pond, desert
- (ii) Bacteria and fungi are decomposers. Select the function performed by bacteria and fungi in an ecosystem.
- Decomposers convert organic material to inorganic form.
 - Decomposers convert inorganic material to organic form.
 - Decomposers convert inorganic material to simpler form.
 - Decomposers do not convert organic material to inorganic forms.
- (iii) An ecological pyramid is a graphic representation of the numbers or the amount of accumulated energy at different trophic levels in a food chain in an ecosystem. Observe the ecological pyramid of energy and select which trophic level would have the maximum energy?



- Producers
- Primary consumers
- Tertiary consumers
- Decomposers

16

SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Multiple based Questions

1. Which one of the following is an example of renewable resource ?

- (a) Coal
- (b) Petroleum
- (c) Wildlife
- (d) Natural gas

Ans. (c)

2. Which one of the following is an example of nonrenewable resource ?

- (a) Water
- (b) Vegetation
- (c) Wind
- (d) Coal and minerals

Ans. (d)

3. Which of the following are to be managed for sustainable development ?

- (a) Industries
- (b) Forests
- (c) Crops
- (d) Resources

Ans. (d)

4. When we destroy a forest, we destroy

- (a) the trees
- (b) population of wildlife
- (c) the environment
- (d) food and shelter of wild animals

Ans. (c)

5. Which of the following is not an use of forest ?

- (a) Controls flood
- (b) Used to make paper
- (c) Causes soil erosion
- (d) Resin, gum and drugs are obtained

Ans. (c)

6. Ground water will not be depleted due to

- (a) afforestation
- (b) thermal power plants
- (c) loss of forest and decrease rainfall
- (d) cropping of high water demanding crops

Ans. (a)

7. Which of the following does not help in protecting our environment ?

- (a) Deforestation
- (b) Intensive cropping
- (c) Rotation of crops
- (d) Treatment of sewage

Ans. (a)

8. The main aim of conservation and preservation is to

- (a) preserve the wildlife (b) preserve the fuels
(c) preserve the biodiversity (d) preserve the plants

Ans. (c)

9. Which one of the following is not a fossil fuel ?

- (a) Coal (b) Petrol
(c) Uranium (d) Natural gas

Ans. (c)

10. Van Mahotsava is meant for

- (a) Deforestation (b) Afforestation
(c) Commercial forestry (d) Starting grazing season

Ans. (b)

11. Which of the following is the most dwindling natural resource?

- (a) water (b) soil
(c) forests (d) solar radiations

Ans. (c)

12. 'Vasudhaiv Kutumbakam' means

- (a) one family is our earth (b) the entire earth is one family
(c) we all belong to the earth (d) we must respect our mother earth

Ans. (b)

13. Which of the natural resources can not be recycled over and over again?

- (i) Coal (ii) petroleum (iii) soil (iv) air
(a) (i) and (ii) (b) (iii) and (iv)
(c) (iv) (d) (iii)

Ans. (a)

14. Which of the following is a natural resource?

- (a) Wooden house (b) Aluminum can
(c) Battery (d) Mango tree

Ans. (d)

15. Which of the following are the causes of CO₂ emission in the atmosphere?

- (i) Burning of fossil fuels
(ii) Decomposition of organic matter
(iii) Afforestation
(iv) Deforestation

62 Multiple Based Questions—10

(a) *i, ii and iii*

(b) *i, ii and iv*

(c) *ii and iii*

(d) *i and iv*

Ans. (b)

16. Which of the following NGO is not working for the environment protection and conservation?

(a) Friends of the earth

(b) Child care organisation

(c) Earth justice

(d) Green Peace Fund

Ans. (b)

17. When did multi-crore project come in, to clean the quality of water in the Ganga?

(a) 1982

(b) 1984

(c) 1985

(d) 1986

Ans. (c)

18. Which of the following is/are dumped into the river Ganga which make it a drain?

(i) Human excreta

(ii) Garbage

(iii) Water from other sacred rivers

(iv) Unrested sewage

(a) *i, ii and iii*

(b) *i, ii and iv*

(c) *only iii*

(d) *only iv*

Ans. (b)

19. Coliform is a group of bacteria found in human _____?

(a) liver

(b) lungs

(c) intestine

(d) stomach

Ans. (c)

20. Presence of which group of bacteria is considered as an indicator of water?

(a) *E. coli*

(b) coliform

(c) clostridium

(d) *vibrio cholera*

Ans. (b)

21. Which of the following material is not used for making roads?

(a) Bricks

(b) Concrete

(c) Bitumen

(d) Asphalt

Ans. (a)

22. Which of the following resource is not obtained from the earth?

(a) soil

(b) sunlight

(c) water

(d) wind

Ans. (b)

23. Which of the following cannot be used again and again?

- (a) Bottles and cans of Jams and pickles (b) used envelopes
(c) old books (d) old newspapers

Ans. (d)

24. Which of the following things are not taken by the people who live in a forest?

- (a) Tendu leaves to make bidis (b) Large quantities of fire wood
(c) Nuts and medicines from the forests (d) Implements for agriculture, fishing and hunting.

Ans. (a)

25. There is five R's mantra to save the environment. Which of the following is used for the given statement—cups with broken handles can be used to grow small plants and as feeding vessels for birds.

- (a) Reuse (b) Recycle
(c) Re-purpose (d) Reduce

Ans. (c)

26. The main reason for the abundant coliform bacteria in the water of river Ganga is

- (a) washing of clothes on the banks of river.
(b) disposal of unburnt corpses into river water.
(c) discharge of industrial water into river water.
(d) immersion of ashes of the dead into the river.

Ans. (b)

27. Which one of the following is not the cause of damage to forests?

- (a) Deforestation for growing herbs
(b) Deforestation by local people to fulfil their needs
(c) Deforestation for development projects
(d) Deforestation for industrial needs

Ans. (a)

28. Which one of the following is not the stakeholders of forests?

- (a) People living in and around the forest
(b) Forest department of the government and industrialists
(c) People living in urban areas
(d) Wildlife and nature enthusiasts

Ans. (c)

29. Mono-culture plantations provide a regular source of raw materials to industries and an important source of revenue to this forest department. Which of the following cannot be grown as mono-culture plantation?

- (a) Mango (b) Pine
(c) Teak (d) Eucalyptus

Ans. (a)

64 Multiple Based Questions—10

30. Wild life is to be preserved in its present form as
- (i) Wild life increases population and maintains food chain.
 - (ii) It balances population and maintains food chain.
 - (iii) It does not control pollution but contributes to the source of gene bank.
 - (iv) It controls pollution and provides source of gene bank.
- (a) *i and iii* (b) *i and iv*
(c) *ii and iii* (d) *ii and iv*

Ans. (d)

Assertion-Reason Questions

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Assertion (A) and Reason (R) are true and R is the correct explanation of Assertion (A).
- (b) Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
- (c) Assertion (A) is true but Reason (R) is false.
- (d) Assertion (A) is false but Reason (R) is true.

31. **Assertion (A):** One must follow 5 R's to conserve the environment.

Reason (R): One conserves natural resources not only for future generations also because economic development is linked with it.

Ans. (a)

32. **Assertion (A):** Forests are biodiversity hot spots which means the number of species found there.

Reason (R): Forests maintain ecological balance by providing oxygen and carbon dioxide and maintain water cycle and nutrient cycles.

Ans. (b)

33. **Assertion (A):** It is important to make small check dams across the flooded gullies.

Reason (R): Small check-dams claims across flooded gullies hold water, prevent soil erosion and recharge ground water.

Ans. (a)

34. **Assertion (A):** Damage to the environment takes place when all natural resources are exploited.

Reason (R): Mining causes pollution due to the production of large amount of slag which is discarded for every tonne of metal extracted.

Ans. (b)

35. **Assertion (A):** Our choices affect the environment, these effect may be immediate or long term or long rang of.

Reason (R): We must make environment friendly choice to conserve, preserve and protect our environment.

Ans. (a)

Case-based Questions

36. The Ganga Action plan was launched in India on 14th January 1986 by Rajiv Gandhi. Its main objective was to project the river, improve the quality of its water and prevent further pollution. River Ganga, along with its tributaries is the largest river system of India and covers over 2500 km from Gangotri to Ganga Sagar in the Bay of Bengal and is the main river system used for irrigation of fertile northern plains. Over the years, this sacred river has become dumping source for untreated sewage and untreated effluents of thousands of industries set up along its bank bathing, washing of clothes, immersion of ashes, intro wing of unburnt corpses in the river has increased the levels of pollution in the river and resulted in killing of aquatic life including fishes.

(i) Which of the following factors help us to find out the contamination of river water?

(I) Total amoeba count (II) Total coliform count

(III) pH of water (IV) Turbidity of water

(a) (I) and (IV) (b) (II) and (III)

(c) (II) and (IV) (d) (II) and (I)

(ii) The fresh water plants and animals enlive in the pH range of

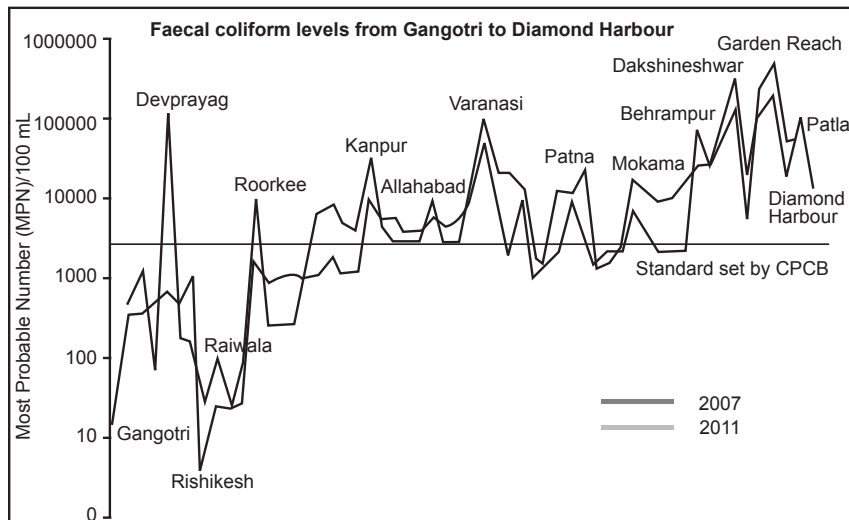
(a) 2.5 – 3.5 (b) 3.5 – 4.5

(c) 6.5 – 7.5 (d) 9.5 – 10.5

(iii) The effluents of some of the factories lower the pH of river water to the range of 2.5 – 3.5 in which the aquatic organisms do not survive. Which of the following factories is the most likely cause for bringing down the large of 2.5 – 3.5?

(a) alcohol distillery (b) soap and detergent factory

(c) textile industry (d) lead battery manufacturing factory



(iv) Observe the fig. and select the city which has the maximum total coliform (MPN/100 ml).

(a) Haridwar (b) Kanpur

(c) Patna (d) Narora

66 Multiple Based Questions—10

(v) Sustainable development encourages development for current generation and conservation of resources for future generations. Select the correct statements related to sustainable development.

(I) Stopping economic development to conserve the environment is sustainable development.

(II) Sustainable development is a short term planning and its gains are not permanent.

(III) Sustainable development considers the view points of all stake holders.

(IV) Economic development and environment conservation should go hand in hand.

(a) (I) and (II)

(b) (II) and (III)

(c) only (III)

(d) (III) and (IV)

Ans. (i) (b) (ii) (c) (iii) (d)
(iv) (b) (v) (d)

37. Forests are important renewable natural resource dominated by trees. Nearly one third of the earth's land area comes under forest cover. Over the years, the forest have been cleared for fuel, timber agriculture, housing, factories, roads, dams, canal etc. Any disturbance in the basic structure of forest damages the biodiversity and lose of biodiversity leading to ecological imbalance. Various NGO and principals of schools are organizing campaigns like debates slogan writeup, poster making etc to create awareness amongst the student to conserve, preserve and protect the forests.



(i) All the naturally occurring plants, animals and microorganisms excluding domesticate and tamed are collectively known as

(a) flora

(b) faluria

(c) wild life

(d) forest

Part-II

[Practice Papers]

1

PRACTICE PAPER

[Time Allowed: 90 Minutes]

[Maximum Marks: 40]

General Instructions:

1. The Question Paper contains three sections.
2. **Section A** has **24** questions. Attempt any **20** questions.
3. **Section B** has **24** questions. Attempt any **20** questions.
4. **Section C** has **12** questions. Attempt any **10** questions.
5. All questions carry equal marks.
6. There is **no** negative marking.

SECTION – A

Section – A consists of 24 questions. Attempt any 20 questions from this section.

The first attempted 20 questions would be evaluated.

1. Which of the following contains covalent bond?

(a) MgCl_2 (b) CaF_2 (c) Al_2O_3 (d) HCl

Ans. (d)

2. The number of covalent bonds in C_4H_{10} is

(a) 10 (b) 8 (c) 13 (d) 12

Ans. (c)

3. The self linkage property (catenation) is maximum in

(a) carbon (b) silicon (c) sulphur (d) phosphorus

Ans. (a)

4. Carbon exists in the atmosphere in the form of

(a) carbon monoxide only
(b) carbon monoxide in traces and carbon dioxide
(c) carbon dioxide only
(d) coal

Ans. (c)

5. Which of the following statements are usually correct for carbon compounds? These
- (i) are good conductors of electricity
 - (ii) are poor conductors of electricity
 - (iii) have strong forces of attraction between their molecules
 - (iv) do not have strong forces of attraction between their molecules
- (a) (i) and (iii) (b) (ii) and (iii) (c) (i) and (iv) (d) (ii) and (iv)

Ans. (d)

6. The metal which is hard and has high melting point and used in filaments of electrical bulbs is

(a) Ni (b) Fe (c) Pt (d) W(Tungsten)

Ans. (d)

7. There is a greater possibility for the evolution of a new species in organisms which reproduce by

(a) binary fission (b) budding (c) fertilisation (d) regeneration

Ans. (c)

8. Which of the following is not an artificial method of vegetative propagation?

(a) Cutting (b) Layering (c) Budding (d) Grafting

Ans. (c)

9. The ability of an organism to develop whole body from a broken piece or fragment is called

(a) binary fission (b) budding (c) multiple fission (d) regeneration

Ans. (d)

10. The fertilisation of human egg by the sperm takes place in

(a) vagina (b) uterus (c) ovary (d) oviduct

Ans. (d)

11. When a sperm is deposited into the vagina which route does it travel?

(a) Vagina → Oviduct → Uterus → Cervix

(b) Vagina → Ovary → Uterus → Oviduct

(c) Vagina → Cervix → Uterus → Oviduct

(d) Vagina → Uterus → Cervix → Oviduct

Ans. (c)

12. Mendelian experiment consisted of breeding tall pea plants bearing violet flowers with short pea plants bearing white flowers. In the progeny all bore violet flowers, but almost half of them are short. This suggests that the genetic make-up of the tall parent can be depicted as

(a) TTWW

(b) TTww

(c) TtWW

(d) TtWw

Ans. (c)

70 Objective Type Questions—10

13. Which of the following is an example of genetic variation?

- (a) One person has a scar, but his friend does not.
- (b) One person is older than another.
- (c) Reeta eats meat, but her sister Geeta is a vegetarian.
- (d) Two children have different eye colours.

Ans. (d)

14. Human offspring's sex is determined

- (a) through father's sex chromosomes.
- (b) through mother's sex chromosomes.
- (c) by hormones.
- (d) by enzymes.

Ans. (a)

15. The maleness of a child is determined by

- (a) the X chromosome in the zygote
- (b) the Y chromosome in zygote
- (c) the cytoplasm of germ cell which determines the sex
- (d) sex is determined by chance

Ans. (b)

16. Two pink coloured flowers on crossing resulted in 1 red, 2 pink and 1 white flower progeny. The nature of the cross will be

- (a) double fertilisation
- (b) self-pollination
- (c) cross-fertilisation
- (d) no fertilisation

Ans. (c)

17. A piece of wire of resistance R is cut into five equal parts. These parts are then connected in parallel. If the equivalent resistance of this combination is R' , then the ratio R/R' is

- (a) $\frac{1}{25}$
- (b) $\frac{1}{5}$
- (c) 5
- (d) 25

Ans. (d)

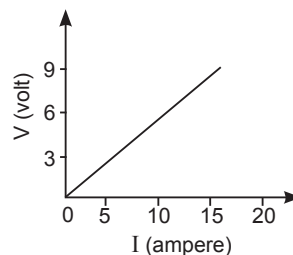
18. A wire of length l , made of material resistivity ρ is cut into two equal parts. The resistivity of the two parts are equal to,

- (a) ρ
- (b) $\frac{\rho}{2}$
- (c) 2ρ
- (d) 4ρ

Ans. (a)

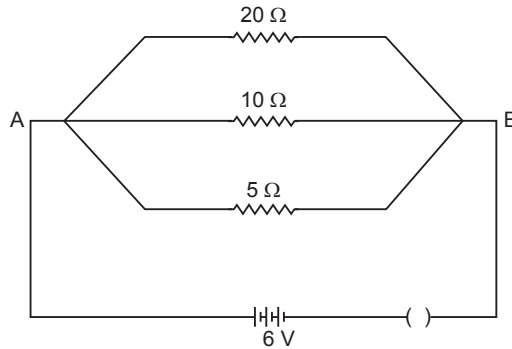
19. The resistance whose $V - I$ graph is given below is

- (a) $\frac{5}{3} \Omega$
- (b) $\frac{3}{5} \Omega$
- (c) $\frac{5}{2} \Omega$
- (d) $\frac{2}{5} \Omega$



Ans. (b)

20. Calculate the current flows through the $10\ \Omega$ resistor in the following circuit.



- (a) 1.2 A (b) 0.6 A (c) 0.2 A (d) 2.0 A

Ans. (b)

21. If R_1 and R_2 be the resistance of the filament of 40 W and 60 W respectively operating 220 V, then

- (a) $R_1 < R_2$ (b) $R_2 < R_1$ (c) $R_1 = R_2$ (d) $R_1 \geq R_2$

Ans. (b)

22. Which of the following correctly describes the magnetic field near a long straight wire?

- (a) The field consists of straight lines perpendicular to the wire.
 (b) The field consists of straight lines parallel to the wire.
 (c) The field consists of radial lines originating from the wire.
 (d) The field consists of concentric circles centred on the wire.

Ans. (d)

23. A current through a horizontal power line flows from south to North direction. The direction of magnetic field line 0.5m above it is towards

- (a) North (b) South (c) West (d) East

Ans. (d)

24. The nature of magnetic field line passing through the centre of current carrying circular loop is

- (a) circular (b) ellipse (c) parabolic (d) straight line

Ans. (d)

SECTION – B

Section – B consists of 24 questions (Sr. No.25 to 48). Attempt any 20 questions from this section.

The first attempted 20 questions would be evaluated.

25. Which of the following is correct order of size ?

- (a) $\Gamma^+ > I > \Gamma^-$ (b) $\Gamma^- > I > \Gamma^+$ (c) $I > \Gamma^+ > \Gamma^-$ (d) $I > \Gamma^- > \Gamma^+$

Ans. (b)

72 Objective Type Questions—10

26. Which of the following hydroxides is most basic?
(a) $\text{Be}(\text{OH})_2$ (b) $\text{Ba}(\text{OH})_2$ (c) $\text{Ca}(\text{OH})_2$ (d) $\text{Mg}(\text{OH})_2$

Ans. (b)

27. Which of the following is correct order of atomic size ?
(a) $\text{Cl} < \text{F} < \text{Br} < \text{I}$ (b) $\text{F} < \text{Cl} < \text{Br} < \text{I}$
(c) $\text{I} < \text{Br} < \text{Cl} < \text{F}$ (d) $\text{Br} < \text{I} < \text{Cl} < \text{F}$

Ans. (b)

28. Which of the following is most reactive?
(a) Li (b) H (c) Na (d) K

Ans. (d)

29. Which of the following is non-metal and to which group does it belong?
(a) Lead (b) Gallium (c) Bromine (d) Cadmium

Ans. (c)

30. Chlorine (17) belongs to which group and period
(a) 7, 3 (b) 17, 3 (c) 1, 3 (d) 16, 3

Ans. (b)

Question No. 31 to 35 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true and R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

31. **Assertion:** Methane is simplest saturated hydrocarbon which is a major component of natural gas.

Reason: Methane belongs to alkene.

Ans. (c)

32. **Assertion:** Group 1 and 2 element all are metals.

Reason: Group 1 and 2 elements can lose electrons easily to form cations (positive ions)

Ans. (a)

33. **Assertion:** *Amoeba* reproduced by fission

Reason: All unicellular organisms reproduced by asexual method.

Ans. (a)

34. **Assertion:** Ozone layer is getting depleted at upper atmosphere which is a cause of concern.

Reason: CFC reacts with ozone and breaks it.

Ans. (a)

35. **Assertion:** The statement of Ohm's law is $V = IR$

Reason: $V = IR$ is the equation which defines resistance.

Ans. (c)

36. Where does fertilisation take place?

- (a) Uterus (b) Vagina (c) Fallopian tube (d) Cervix

Ans. (c)

37. The two versions of a trait (character) which are brought in by the male and female gametes are situated on

- (a) copies of the same chromosome (b) two different chromosomes
(c) sex chromosomes (d) any chromosome

Ans. (a)

38. The genetic constitution of an organism is called.

- (a) Genotype (b) Phenotype (c) Variation (d) Gene

Ans. (a)

39. If the current I through a resistor is increased by 100 % (assume that temperature remains unchanged), the increase in power dissipated will be

- (a) 100 % (b) 200 % (c) 300 % (d) 400 %

Ans. (c)

40. A piece of wire of resistance R is drawn to double its length.

The new resistance is

- (a) R (b) $2R$ (c) $4R$ (d) $\frac{R}{4}$

Ans. (c)

41. Two wires of equal length made of materials of resistivity ratio 1 : 2 and area of cross-section 3 : 2 have the potential drop across them in the ratio $X : Y$ when connected in series. The ratio $X : Y$ is

- (a) 3 : 1 (b) 2 : 5
(c) 5 : 2 (d) 1 : 3

Ans. (d)

42. One kilowatt hour is equal to

- (a) $36 \times 10^6 \text{ J}$ (b) $36 \times 10^{-5} \text{ J}$
(c) $3.6 \times 10^6 \text{ J}$ (d) $0.36 \times 10^6 \text{ J}$

Ans. (c)

43. A soft iron bar is introduced inside the current carrying solenoid. The magnetic field inside the solenoid

- (a) will decrease (b) will remain same
(c) will increase (d) will become zero

Ans. (c)

44. A positive charge is moving upwards in a magnetic field directed towards north. The particle will be deflected towards

- (a) west (b) north (c) south (d) east

Ans. (a)

74 Objective Type Questions—10

45. In electric motor, to make the coil rotating continuously in the same direction, current is reversed in the coil after every half rotation by a device called

- (a) carbon brush (b) commutator
(c) slip ring (d) armature

Ans. (b)

46. What marks the beginning of the reproductive life of a woman?

- (a) Menopause (b) Menarche (c) Fertilisation (d) Ovulation

Ans. (b)

47. A pair of duct arising from testis, which carry sperms are

- (a) fallopian tube (b) vas deferens (c) oviduct (d) urethra

Ans. (b)

48. In the list of organisms given below, those that reproduce by the asexual method are

- (i) banana (ii) dog (iii) yeast (iv) *Amoeba*
(a) (ii) and (iv) (b) (i), (iii) and (iv)
(c) (i) and (iv) (d) (ii), (iii) and (iv)

Ans. (b)

SECTION – C

Section – C consists of three Cases followed by questions. There are a total of 12 questions in this section. Attempt any 10 questions from this section.

The first attempted 10 questions would be evaluated.

Case:

Homologous series is series of organic compound with same functional group and similar chemical properties. Each successive member differs by $-\text{CH}_2$ and 14 u in terms of mass. They have gradation in physical properties as shown in the table given below:

S. No.	Hydrocarbon	Relative Molar mass	Boiling points
1	Methane (CH_4)	16	-162°C
2	Ethane (C_2H_6)	30	-89°C
3	Propane (C_3H_8)	44	-42°C
4	Butane (C_4H_{10})	58	-0.5°C
5	<i>n</i> -Pentane (C_5H_{12})	72	36°C
6	Isopentane (2-methyl butane)	72	24°C
7	Neopentane (2, 2-dimethyl propane)	72	9.5°C

49. Which of the following alkane has highest calorific value?

- (a) CH_4 (b) C_2H_6 (c) C_3H_8 (d) C_4H_{10}

Ans. (a)

50. Which of the following has highest melting point?

- (a) Methane (b) Ethane (c) Propane (d) Butane

Ans. (d)

51. Which of the following has lowest boiling point?

- (a) *n*-Hexane (b) Isopentane
(c) Pentane (d) Neopentane

Ans. (d)

52. The number of isomers of hexane are:

- (a) 2 (b) 3
(c) 4 (d) 5

Ans. (d)

Case :

There are more than 1000 pesticides used around the world to ensure food is not damaged or destroyed by pests. Each pesticide has different properties and toxicological effects. Many of the older, cheaper pesticides, such as dichlorodiphenyltrichloroethane (DDT) and lindane, can remain for years in soil and water. These chemicals have been banned by countries who signed the 2001 Stockholm Convention – an international treaty that aims to eliminate or restrict the production and use of persistent organic pollutants. The toxicity of a pesticide depends on its function and other factors. None of the pesticides that are authorized for use on food in international trade today are genotoxic. Adverse effects from these pesticides occur only above a certain safe level of exposure. When people come into contact with large quantities of pesticide, this may cause acute poisoning or long-term health effects, including cancer and adverse effects on reproduction. Nobody should be exposed to unsafe amounts of pesticide. People spreading pesticide on crops should be adequately protected. People not directly involved in the spread of pesticides should stay away from the area during and just after a spread. Food that is sold should comply with pesticide regulations, in particular with maximum residue limits. Consumers can further limit their intake of pesticide residues by peeling or washing fruit and vegetables, which also reduces other foodborne hazards, such as harmful bacteria.

53. Which of the following pesticides are banned by countries who signed Stockholm Convntion?

- (a) Malathion and 2,4 D
(b) Malathion and DDT
(c) DDT and Lindane
(d) Lindane and 2,4 D

Ans. (c)

54. Consumers can restrict intake of pesticide residue by:

- (a) Washing fruits and vegetables.
(b) Peeling fruits and vegetables.
(c) Both (a) and (b).
(d) None of the above

Ans. (c)

76 Objective Type Questions—10

- 55.** Biomagnification is defined as:
- (a) increase in number in a species.
 - (b) increase in number of species.
 - (c) increased use of harmful chemicals.
 - (d) increase in concentration of toxic chemicals with increase in trophic level.

Ans. (d)

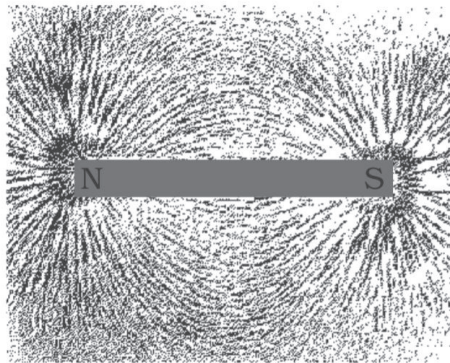
- 56.** Oxygen molecules in upper atmosphere gets converted into ozone molecules by the action of:

- (a) heat
- (b) UV rays
- (c) moisture
- (d) All of the above

Ans. (b)

Case :

Michael Faraday was an experimental physicist. He introduces the concept of the magnetic line of force to represent a magnetic field visually. According to his experiment, when bar magnet is surrounded by little bits of iron filings, each a little magnet of its own. By tapping the surface, the iron filings arrange themselves in a particular pattern. They respond to an unseen presence—what Faraday called it “lines of force.” The following sketch shows the lines of force due to a bar magnet on the accumulated action on little iron filings.



- 57.** A piece of material that has both attractive and directive properties is called _____.
- (a) magnet
 - (b) iron filings
 - (c) resistor
 - (d) coil (inductor)

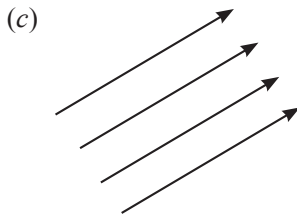
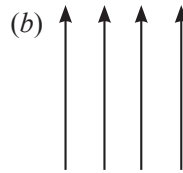
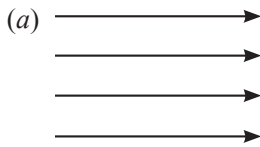
Ans. (a)

- 58.** A bar magnet is cut into two pieces along its length. Which of the following statement is true?

- (a) Two new bar magnets are created with half of pole strength.
- (b) Two new bar magnets are created with double pole strength.
- (c) Bar magnet is demagnetized.
- (d) The one part created magnetic field while other created electric field.

Ans. (a)

59. Which of the following diagram indicating an uniform magnetic field?



(d) All of the above

Ans. (d)

60. The direction of magnetic field lines out side the bar magnet is

- (a) from South pole to North pole
- (b) from North pole to South pole
- (c) towards East from both the poles
- (d) towards West from both the poles

Ans. (b)

5. The correct electron dot structure of a water molecule is

- (a) $\text{H} \cdot \ddot{\text{O}} \cdot \text{O}$ (b) $\text{H} : \ddot{\text{O}} : \text{O}$ (c) $\text{H} : \ddot{\text{O}} : \text{H}$ (d) $\text{H} : \text{O} : \text{O}$

Ans. (c)

6. Which is the most common method of reproduction in majority of fungi and bacteria?

- (a) Budding (b) Spore formation
(c) Binary fission (d) Multiple fission

Ans. (b)

7. Many unicellular organisms reproduce by the process of

- (a) fission (b) ovulation (c) regeneration (d) non-disjunction

Ans. (a)

8. Pollen grains are produced by

- (a) ovary (b) ovule (c) anther (d) corolla

Ans. (c)

9. Which of the following is a primary sex organ in a mammal?

- (a) Ovary (b) Vagina (c) Uterus (d) Mammary glands

Ans. (a)

10. The ability to reproduce is lost in a female after

- (a) fertilisation (b) menstruation
(c) gamete formation (d) menopause

Ans. (d)

11. In case the ova does not fertilise, which of the following events will take place?

- (a) Menstruation (b) Pregnancy
(c) Implantation (d) Ovulation

Ans. (a)

12. To study the natural phenomenon of inheritance, Mendel selected the pea plants. Which of the following properties were suitable for their studies?

- (i) Plants would easily self pollinate or cross pollinate in nature.
(ii) Plants were easily grown in garden soil with a considerably shorter generation time.
(iii) Pea plants do not require the true-breeding for hybridisation experiments.
(iv) Many parts of the plant such as pod, seed, flower, cotyledons showed distinct phenotypes.
- (a) (i), (ii) and (iii). (b) (ii) and (iv).
(c) (i) and (ii). (d) (ii), (iii) and (iv).

Ans. (b)

13. The number of contrasting characters in garden pea plant were noted by Mendel was—

- (a) 4 (b) 5 (c) 6 (d) 7

Ans. (d)

80 Objective Type Questions—10

14. An observable and physical expression of the trait

- (a) Genotype (b) Phenotype (c) Prototype (d) Polytype

Ans. (b)

15. Which of the following law states that each characteristics is controlled by two factors, which separate and go to different gametes when an organism reproduces?

- (a) Law of unit characters (b) Law of segregation
(c) Law of dominance (d) Law of recessiveness

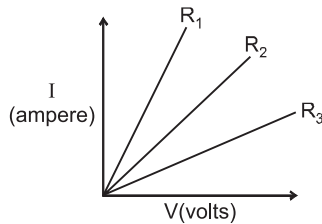
Ans. (b)

16. Two pink coloured flowers are self pollinated resulting in 1 red, 2 pink and 1 white flower progeny. What would be the nature of the cross?

- (a) Cross pollination (b) Self pollination
(c) Test cross (d) Fertilization

Ans. (b)

17. A student carries out an experiment and plots the V-I graph of three samples of nichrome wire with resistances R_1 , R_2 and R_3 respectively. Which of the following is true?



- (a) $R_1 = R_2 = R_3$ (b) $R_1 > R_2 > R_3$ (c) $R_3 > R_2 > R_1$ (d) $R_2 > R_3 > R_1$

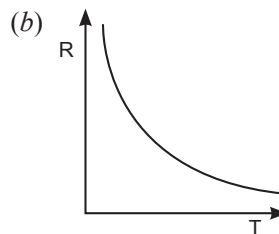
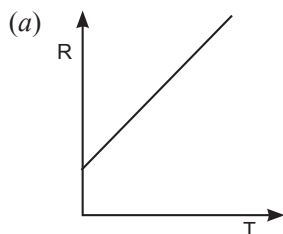
Ans. (c)

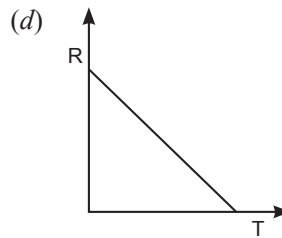
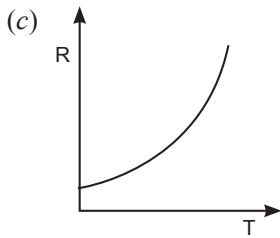
18. An electric bulb is rated 220 V and 100 W. When it is operated on 110 V, the power consumed will be

- (a) 100 W (b) 75 W (c) 50 W (d) 25 W

Ans. (d)

19. The temperature of a conductor is increased. The graph best showing the variation of its resistance is





Ans. (a)

20. Two devices are connected between two points say A and B in parallel. The physical quantity that will remain the same between the two points is

- (a) current (b) voltage (c) resistance (d) None of these

Ans. (b)

21. Ohm's law fails

- (a) temperature and pressure are not kept constant
 (b) to explain the behaviour of semiconductor
 (c) to explain the phenomenon of electric arc
 (d) All of above

Ans. (d)

22. The phenomenon of electromagnetic induction is

- (a) the process of charging a body.
 (b) the process of generating magnetic field due to a current passing through a coil.
 (c) producing induced current in a coil due to relative motion between a magnet and the coil.
 (d) the process of rotating a coil of an electric motor.

Ans. (c)

23. By which instrument, the presence of magnetic field be determined?

- (a) Magnetic Needle (b) Ammeter
 (c) Galvanometer (d) Voltmeter

Ans. (a)

24. The strength of magnetic field around a current carrying conductor is

- (a) inversely proportional to the current but directly proportional to the square of the distance from wire.
 (b) directly proportional to the current and inversely proportional to the distance from wire.
 (c) directly proportional to the distance and inversely proportional to the current
 (d) directly proportional to the current but inversely proportional the square of the distance from wire.

Ans. (b)

SECTION – B

Section – B consists of 24 questions (Sr. No.25 to 48). Attempt any 20 questions from this section.

The first attempted 20 questions would be evaluated.

25. Which of the following does not belong to the same homologous series?

- (a) CH_4 (b) C_2H_6 (c) C_3H_8 (d) C_4H_8

Ans. (d)

26. The heteroatoms present in



- (i) oxygen (ii) carbon (iii) hydrogen (iv) chlorine
 (a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)

Ans. (d)

27. Which of the following gives the correct increasing order of the atomic radii of O, F and N ?

- (a) O, F, N (b) N, F, O (c) O, N, F (d) F, O, N

Ans. (d)

28. Upto which element, the Law of Octaves was found to be applicable

- (a) Oxygen (b) Calcium (c) Cobalt (d) Potassium

Ans. (b)

29. Which of the following elements does not lose an electron easily ?

- (a) Na (b) F (c) Mg (d) Al

Ans. (b)

30. Which of the following set of elements is written in order of their increasing metallic character ?

- (a) Be Mg Ca
 (b) Na Li K
 (c) Mg Al Si
 (d) C O N

Ans. (a)

Question No. 31 to 35 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true and R is not the correct explanation of A.
 (c) A is true but R is false.
 (d) A is false but R is true.

31. Assertion: Fluorine is more reactive than chlorine.

Reason: Fluorine and chlorine belong to the Group 17 called Halogens.

Ans. (b)

32. Assertion: In male reproductive system, transport of sperm takes place in a fluid which also provide nutrition.

Reason: Protective glands and seminal vesicles secret in the vas deferens.

Ans. (a)

33. Assertion: Biodegradable waste and non biodegradable waste should be discarded separately,

Reason: Biodegradable waste are not harmful.

Ans. (c)

34. Assertion: If a graph is plotted between potential difference and current a linear graph is obtained.

Reason: Current is directly proportional to the potential difference.

Ans. (a)

35. Assertion: Strength of an electromagnet depends on the magnitude of current flowing through them.

Reason: Electromagnets are majorly used for lifting heavy weights.

Ans. (b)

36. What do you find when you observe a sugarcane field?

(i) Very little variations in various sugarcane plants.

(ii) A lot of variations in various sugarcane plants.

(iii) No variations in various sugarcane plants.

(iv) Sugarcane plants at most look alike.

(a) (i) and (iv) (b) (ii) and (iv) (c) (iii) and (iv) (d) only (ii)

Ans. (a)

37. Mendel selected garden pea plant for series of hybridization experiments because it had the special features. Select the feature which pea plant does not have.

(a) Garden pea plant was easy to grow.

(b) Garden pea plant had a short life cycle.

(c) Garden pea plant had distinct, easily visible contrasting characters.

(d) Garden pea plant produced a few seeds in one generation.

Ans. (d)

38. Which of the following constitute a food-chain?

(a) Grass, wheat and mango

(b) Grass, goat and human

(c) Goat, cow and elephant

(d) Grass, fish and goat

Ans. (b)

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39. When the foetus is growing inside the uterus it needs nutrients. Which part provides these nutrients?

- (a) Placenta
- (b) Amniotic sac
- (c) Oviduct
- (d) Uterus

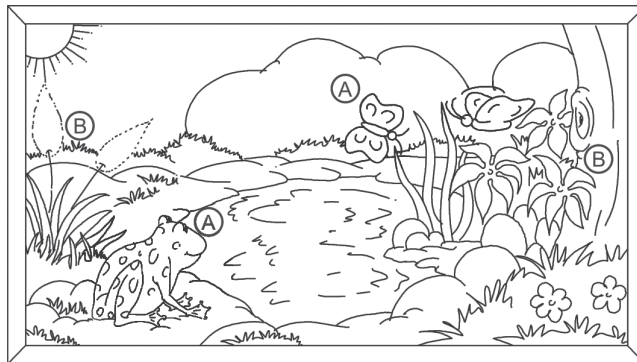
Ans. (a)

40. Which of the following are environment-friendly practices?

- (a) Carrying cloth-bags to put purchases in while shopping.
- (b) Switching off unnecessary lights and fans.
- (c) Walking to school instead of getting your mother to drop you on her scooter.
- (d) All of the above.

Ans. (d)

41. An ecosystem is represented in the figure given. This ecosystem will be self-sustaining if



- (a) the type of organisms represented by B are eliminated.
- (b) materials cycle between the organisms labelled A and the organisms labelled B.
- (c) the organisms labelled A outnumber the organisms labelled B.
- (d) the organisms labelled A are equal in number to the organisms labelled B.

Ans. (b)

42. Which of the following statements about food chain and energy flow through ecosystem is false?

- (a) Food webs include two or more food chains.
- (b) All organisms that are not producers are consumers.
- (c) A single organism can feed at several trophic levels.
- (d) Detritivores feed at all trophic levels except the producer level.
- (e) The lower the trophic level at which an organism feeds, the more energy available.

Ans. (d)

43. A current through a horizontal power line flows from south to North direction. The direction of magnetic field line 0.5m above it is towards

- (a) North (b) South (c) West (d) East

Ans. (d)

44. Polarity of a current carrying solenoid can be determined by

- (a) use of compass needle
(b) Right hand thumb rule
(c) Fleming left hand rule
(d) either (a) or (b)

Ans. (d)

45. The factors on which one magnetic field strength produced by current carrying solenoids depends are

- (a) Magnitude of current
(b) Number of turns
(c) Nature of core material
(d) All of the above

Ans. (d)

46. Direction of rotation of a coil in electric motor is determined by

- (a) Fleming's right hand rule
(b) Fleming's left hand rule
(c) Faraday law of electromagnetic inductors
(d) None of above

Ans. (b)

47. The condition for the phenomenon of electromagnetic induction is that there must be a relative motion between

- (a) the galvanometer and magnet
(b) the coil of wire and galvanometer
(c) the coil of wire and magnet
(d) the magnet and galvanometer

Ans. (c)

48. Fleming's left hand and Right hand rules are used in

- (a) Generator and electric motor
(b) Electric motor and generator
(c) any rule can be used for any device
(d) both are not applied for generator and motor.

Ans. (b)

SECTION – C

Section – C consists of three Cases followed by questions. There are a total of 12 questions in this section. Attempt any 10 questions from this section.

The first attempted 10 questions would be evaluated.

Case:

Elements are arranged in Modern Periodic table in increasing order of their atomic numbers. Metals are on left hand side and middle of periodic table mainly and non-metals are on right hand side. A zig-zag diagonal line divides metals and non-metals. Elements near zig-zag line are called Periodic Classification of Elements 169 metalloids. Elements of same group have same number of valence electrons but different number of shells. Elements of same period have different number of valence electrons but same number of shells. Elements in the middle of periodic table are called transition metals.

- 49.** Which one of the following statement is correct?
- (a) All groups contain both metal and nonmetals.
 - (b) In groups 17, reactivity decreases down the group.
 - (c) In group 1, reactivity decreases down the group.
 - (d) Elements of same group have same number of electrons.

Ans. (b)

- 50.** Which of the following is correct formula of hydrides of phosphorus?

- (a) PH_2
- (b) PH_3
- (c) PH_5
- (d) PH_4

Ans. (b)

- 51.** Which group elements are soft, low melting and highly reactive metals?

- (a) group 1
- (b) group 2
- (c) group 16
- (d) group 17

Ans. (a)

- 52.** Which of the following have density less than 1?

- (a) Na
- (b) K
- (c) Li
- (d) All of these

Ans. (d)

Case:

Reproduction is the process by which organisms increase their population. It is of two types – asexual and sexual reproduction. The rates of birth and death determine the size of human population. An expanding population makes it harder to improve everybody's standard of living. If we look around us, we can identify that expanding population is the most important reason for poor living standards. The process of reproduction also introduces new variations. These variations introduce changes which enable species to survive in even adverse environment.

53. Which of the following is not a method of contraception to avoid pregnancy?

- (a) Barrier method
- (b) Hormonal imbalance method
- (c) Surgical method
- (d) Spore formation

Ans. (d)

54. *Leishmania* reproduces by

- (a) binary fission
- (b) multiple fission
- (c) regeneration
- (d) fragmentation

Ans. (d)

55. The mode of reproduction used by *Amoeba* is

- (a) budding
- (b) spore formation
- (c) binary fission
- (d) regeneration

Ans. (c)

56. Select the incorrect statement. Reproduction is necessary—

- (a) to maintain the continuity of species
- (b) to maintain the stability of population of species
- (c) to increase population
- (d) to provide energy for various metabolic processes.

Ans. (d)

Case:

Georg Simon Ohm (1789-1854) was a German mathematician, “The physicist” and a high school teacher. At that time, the resources available to him for his research and experiment were:

- (i) The magnetic field surrounded a wire carrying electric current discovery by Oersted in 1520;
- (ii) The electrochemical cell, described by Volta in 1800; and
- (iii) The thermoelectric effect, discovered by Seebeck in 1822.

From these resources and using equipment of his own creation, he was able to define the fundamental relationship among voltage, current, and resistance, which represents the true beginning of electrical circuit analysis. Now, today in any part of world, most of us use electricity every day. That electricity is handled in circuits: a closed loop of conductors travelling from power plants to neighbourhoods to households and back again. That closed loop uses the three essential parts of a circuit – power supply (or battery), wires, and resistors forms one huge electrical circuit.

57. Ohm’s law is accurately applicable only for metallic conductor at

- (a) low temperature
- (b) very low temperature i.e. superconductor
- (c) very high temperature
- (d) high voltage

Ans. (a)

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58. When the area of cross-section of the conductor is doubled and length remains same then its resistance

- (a) will be doubled
- (b) will decrease by half
- (c) remains the same
- (d) will increase by two times

Ans. (b)

59. The minimum requirements for causing flow of current are:

- (a) A voltage source and a voltmeter and an ammeter
- (b) A voltage source, and a resistor
- (c) A voltage source, a resistor and a switch
- (d) A voltage source, a bulb, a switch and an ammeter

Ans. (b)

60. Resistance of wire always increases if

- (a) temperature decreases
- (b) length reduced
- (c) less number of free electrons available
- (d) more number of free electrons available

Ans. (c)