

Time Allowed : 3 Hours

Maximum Marks : 80

General Instructions:

- I. The question paper comprises three sections – A, B and C. Attempt all the sections.
- II. All questions are compulsory.
- III. Internal choice is given in each section.
- IV. All questions in Section A are **one-mark** questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in **one** word or in **one** sentence.
- V. All questions in Section B are **three-mark**, short-answer type questions. These are to be answered in about **50 – 60** words each.
- VI. All questions in Section C are **five-mark**, long-answer type questions. These are to be answered in about **80 – 90** words each.
- VII. This question paper consists of a total of **30** questions.

SECTION - A

1. Name two salt water ecosystem.
2. Does magnetic monopole exist?
3. **Answer question numbers 3(a) - 3(b) on the basis of your understanding of the following paragraph and the related studied concepts.**

As the electrons work their way through the thin metal filament of the lamp, they encounter more opposition to motion than they typically would in a thick piece of wire. This opposition to electric current depends on the type of material, its cross sectional area, and its temperature. It is technically known as resistance.

Resistance is the obstruction offered to the flow of electric current. (It can be said that conductors have low resistance and insulators have very high resistance). This resistance serves to limit the amount of current through the circuit with a given amount of voltage supplied by the battery, as compared with the short circuit where we had nothing but a wire joining one end of the voltage source (battery) to the other.

The S.I. unit of resistance is ohm (Ω).

The reciprocal of resistance is called conductance $G = 1/R$.

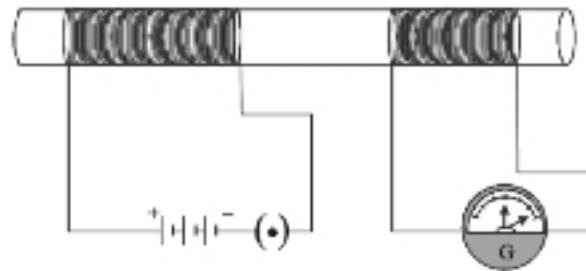
Its S.I. unit is ohm^{-1} or mho or siemen (s).

- (a) Define electric resistance.
- (b) What is the SI unit of resistance?
4. How many covalent bonds are there in a molecule of cyclohexane?
5. Question numbers 5(a) – 5(c) are based on the periodic table. Study the part of the modern periodic table presented below in which the alphabets represent the symbols of elements and answer the following questions.

Group →	1	12	14	15	16	17
Period ↓				M	Q	V
2						
3	A	J			R	W
4	E		L			T
5	G					X

- (a) Consult the above part of the periodic table to predict which of the given combination is a covalent compound: RQ_2 , AT, JQ, JX_2 .
- (b) Considering the above part of the periodic table, which of the given element is the most electropositive element?
- (c) Which of the given element is the most electronegative element?

6. The largest artery in the human body is:
 (a) Systemic artery (b) Lingual artery
 (c) Pulmonary artery (d) Aorta
7. In the arrangement shown in Figure there are two coils wound on a non-conducting cylindrical rod. Initially the key is not inserted. Then the key is inserted and later removed. Then



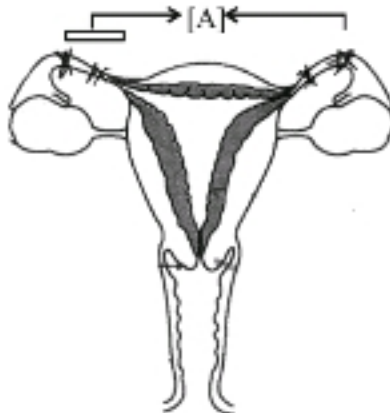
- (a) the deflection in the galvanometer remains zero throughout.
 (b) there is a momentary deflection in the galvanometer but it dies out shortly and there is no effect when the key is removed.
 (c) there are momentary galvanometer deflections that die out shortly; the deflections are in the same direction.
 (d) there are momentary galvanometer deflections that die out shortly; the deflections are in opposite directions.
8. The magnetic field inside a long straight solenoid-carrying current
 (a) is zero. (b) decrease as we move towards its end.
 (c) increases as we move towards its end. (d) is the same at all points.

OR

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.

9.



- (a) Which body part is shown in the diagram?
 (b) Name the process.
 (c) What is [A]?
10. Flow of energy in an ecosystem is always
 (a) unidirectional (b) bidirectional
 (c) multidirectional (d) no specific direction

OR

Organisms of a higher trophic level which feed on several types of organisms belonging to a lower trophic level constitute the

- (a) food web (b) ecological pyramid
 (c) ecosystem (d) food chain

11. The percentage of solar radiation absorbed by all the green plants for the process of photosynthesis is about
(a) 1% (b) 5% (c) 8% (d) 10%
12. At noon the sun appears white as
(a) light is least scattered
(b) all the colours of the white light are scattered away
(c) blue colour is scattered the most
(d) red colour is scattered the most

OR

Which of the following phenomena of light are involved in the formation of a rainbow?

- (a) Reflection, refraction and dispersion
(b) Refraction, dispersion and total internal reflection
(c) Refraction, dispersion and internal reflection
(d) Dispersion, scattering and total internal reflection

For question numbers 13 and 14, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below

- (a) Both A and R are true and R is correct explanation of the assertion.
(b) Both A and R are true but R is not the correct explanation of the assertion.
(c) A is true but R is false.
(d) A is false but R is true.
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13. **Assertion:** Bending a wire does not affect the electrical resistance.

Reason: Resistance of a wire is proportional to resistivity of the material.

14. **Assertion:** Animals adopt different strategies to survive in hostile environment.

Reason: Praying mantis is green in colour which merges with plant foliage.

SECTION - B

15. A man with blood group A marries a woman with blood group O and their daughter has blood group O. Is this information enough to tell you which of the traits—blood group A or O, is dominant? Why or why not?
16. What is meant by dispersion of light? Explain how the ray of white light is dispersed. Which colour deviates more?

OR

Mention the rules for obtaining images by convex and concave lens.

17. Write the electron-dot structures for the following molecules:

- (i) NaCl (ii) Cl₂

18. Why photosynthesis is considered the most important process in the biosphere?

OR

Mention the pathway of urine starting from the organ of its formation. Name four substances which are reabsorbed from the initial filtrate in the tubular part of the nephron.

19. (a) The magnification of a body of size 1m is 2, then find the height of image.
(b) Focal length of 2 lenses are 40cm and -20 cm respectively. Find the power and nature of combined lens.
20. In a solution of silver nitrate, a copper plate was dipped. After some time, silver from the solution was deposited on copper plate. Which metal is more reactive copper or silver? How?
21. (i) State the factors on which heat produced by an electric current passing through a conductor depends? Explain.

- (ii) A potential difference of 250 volts is applied across a resistance of 500 ohms in an electric iron. Calculate (i) the current (ii) heat energy produce in joules in 10 secs?
22. (a) State one difference between:
- Combination and decomposition reaction.
 - Displacement and double displacement reaction.
- (b) Balance the following chemical equation:
- $$\text{Pb}(\text{NO}_3)_2(\text{s}) \xrightarrow{\text{Heat}} \text{PbO}(\text{s}) + \text{NO}_2(\text{g}) + \text{O}_2(\text{g})$$
23. What is STDs (sexually transmitted diseases)? Give some example ?
24. Draw a labelled diagram to show the action of dilute sulphuric acid on zinc granules and answer the following:
- Name the gas evolved in this experiment.
 - How will you test for the gas?

OR

A sanitary worker uses a white chemical having strong smell of chlorine gas to disinfect the water tank.

- Identify the chemical compound, write its chemical formula.
- Give chemical equation for its preparation.
- Write its two uses other than disinfection.

SECTION - C

25. (a) Name the properties of baking powder responsible for the following uses:
- Baking industry
 - As an antacid
 - As soda-acid fire extinguisher
- (b) Acid when react with metals release hydrogen gas but there is one acid which when reacts with metals does not release hydrogen except for two metals. Prove this statement.
- OR**
- What do you mean by the family of salts?
 - Why do HCl, HNO₃, etc., show acidic characters in aqueous solutions while solutions of compounds like alcohol and glucose do not show acidic character ?
 - A weak acid is added to a concentrated solution of hydrochloric acid. Does the solution become more or less acidic ?
26. Give two reasons for avoiding frequent pregnancies of women. Explain the following methods of contraception giving one example of each:
- Barrier method
 - Chemical method
 - Surgical method
27. (a) Use the mirror formula to show that for an object lying between the pole and focus of a concave mirror, the image formed is always virtual in nature.
- (b) A concave mirror of focal length 15 cm forms an image at a distance 10 cm from the mirror. How far is the object placed from the mirror?
28. (a) What is an electromagnet? List any two of its uses.
- (b) What is the purpose of the soft iron core used in making an electromagnet?

OR

What are magnetic field lines? List three characteristics of these lines. Describe in brief an activity to study the magnetic field lines due to a current flowing in a circular coil.

29. (a) What is meant by breathing? What happens to rate of breathing during vigorous exercise?
- (b) Define translocation with respect to transport in plants. Why is it essential for plants?
30. An element M has the electronic configuration 2, 8, 8, 1. On the basis of electronic configuration, answer the following:
- Does this element form acidic or basic oxide?
 - Is it expected to be malleable and ductile or not?
 - Will this element displace hydrogen from dilute acids?
 - Is the element expected to be good conductor of electricity or not?
 - 'M' represents which element?

OR

For each of the following pairs, indicate which one of the two species is larger:

- N³⁻ or F⁻ ;
- Mg²⁺ or Ca²⁺