

PRACTICE PAPER **2***

Time allowed : 2 hours

Maximum marks : 40

General Instructions :

- (i) The question paper comprises four sections A, B, C and D. There are 17 questions in the question paper. All questions are compulsory.
- (ii) Section-A – question no. 1 to 9 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions, assertion - reason type questions, case based questions. Answers to these should be given in one word or one sentence.
- (iii) Section-B – question no. 10 to 12 are short answer type questions, carrying 2 marks each. Answers to these questions should in the range of 30 to 50 words.
- (iv) Section-C – question no. 13 to 15 are short answer type questions, carrying 3 marks each. Answers to these questions should in the range of 50 to 80 words.
- (v) Section-D – question no. - 16 and 17 are long answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.
- (vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (vii) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION - A

1. Why should biodegradable and non-biodegradable wastes to be discarded in two separate dustbins?

OR

Why are green plants called 'producers'?

2. Why is the progeny of pea plant is always tall when a tall pea plant is crossed with a short pea plant?
3. Write any four examples of abiotic components of an ecosystem.
4. Why is vegetative propagation needed for growing some plants?
5. Which of the following statements is not correct?
 - (a) A common functional group is present in different members of a homologous series.
 - (b) Two consecutive members of a homologous series differ by a $-\text{CH}_3$ group.
 - (c) The members of a homologous series can be represented by one general formula.
 - (d) Different members of a homologous series have similar chemical properties.

OR

Match the Family given in List-I to their general formula given in List-II and choose the correct option.

List-I (Family)	List-II (General formula)
(P) Alkyne	1. $\text{C}_n\text{H}_{2n+1}\text{X}$
(Q) Alcohol	2. $\text{C}_n\text{H}_{2n-2}$
(R) Alkyl halide	3. C_nH_{2n}
(S) Alkene	4. $\text{C}_n\text{H}_{2n+2}\text{O}$

(a) P - 1, Q - 2, R - 3, S - 4
(b) P - 2, Q - 4, R - 1, S - 3
(c) P - 4, Q - 2, R - 1, S - 3
(d) P - 2, Q - 1, R - 3, S - 4

For question numbers 6 and 7, two statements are given- one labelled Assertion (A) and the other labelled 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.
6. **Assertion :** Decreasing order of atomic radii is : $\text{Cl} > \text{F} > \text{O} > \text{S}$.
Reason : Atomic radius increases as the number of energy level increases and decreases as nuclear charge increases.
7. **Assertion :** A solenoid tends to expand, when a current passes through it.
Reason : Two straight parallel metallic wires carrying current in same direction attract each other.

OR

Assertion : The direction of force is given by Fleming's left hand rule.

Reason : A magnetic field exert a force on a moving charge in the same direction as the direction of field itself.

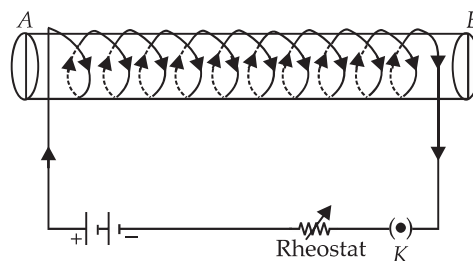
Answer Q. No 8 and 9 contain five sub-parts each. You are expected to answer any four sub-parts in these questions.

8. **Read the following and answer any four questions from 8(i) to 8(v).**

An insulated copper wire wound on a cylindrical cardboard tube such that its length is greater than its diameter is called a solenoid. When an electric current is passed through the solenoid, it produces a magnetic field around it. The magnetic field produced by a current-carrying solenoid is similar to the magnetic field produced by a bar magnet. The field lines inside the solenoid are in the form of parallel straight lines. The strong magnetic field produced inside a current-carrying solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the solenoid. The strength of magnetic field produced by a current carrying solenoid is directly proportional to the number of turns and strength of current in the solenoid.

- (i) The strength of magnetic field inside a long current-carrying straight solenoid is
 (a) more at the ends than at the centre
 (b) minimum in the middle
 (c) same at all points
 (d) found to increase from one end to the other.
- (ii) The north-south polarities of an electromagnet can be found easily by using
 (a) Fleming's right-hand rule
 (b) Fleming's left-hand rule
 (c) Clock face rule
 (d) Left-hand thumb rule.
- (iii) For a current in a long straight solenoid N-and S-poles are created at the two ends. Among the following statements, the incorrect statement is
 (a) The field lines inside the solenoid are in the form of straight lines which indicates that the magnetic field is the same at all points inside the solenoid.
 (b) The strong magnetic field produced inside the solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the coil.
 (c) The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet.
 (d) The N- and S-poles exchange position when the direction of current through the solenoid is reversed.
- (iv) A long solenoid carrying a current produces a magnetic field B along its axis. If the current is double and the number of turns per cm is halved, then new value of magnetic field is
 (a) B
 (b) $2B$
 (c) $4B$
 (d) $B/2$

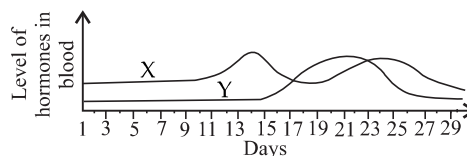
- (v) A soft iron bar is enclosed by a coil of insulated copper wire as shown in figure. When the plug of the key is closed, the face B of the iron bar marked as



- (a) N-pole
(b) S-pole
(c) N-pole if current is large
(d) S-pole if current is small

9. Study the given graph and answer any four questions from 9(i) to 9(v).

The given graph is representing hormonal levels during a normal menstrual cycle in a female. The menstrual cycle is under the control of sex hormones.



- (i) Identify hormones X and Y.

- (a) X-Estrogen, Y-LH
(b) X-Estrogen, Y-Progesterone
(c) X-FSH, Y-LH
(d) X-FSH, Y-Progesterone

- (ii) Select the correct statement regarding X and Y.

- (a) If hormone Y is insufficiently produced in a female then uterine lining might not be sufficiently stable to support an implanted embryo.
(b) Level of hormone Y is very high during menstrual phase of menstrual cycle in a female.
(c) Hormone X is secreted by corpus luteum under the influence of follicle stimulating hormone of anterior pituitary gland.
(d) Hormone X stimulates transformation of a primary follicle of ovary into Graafian follicle.

- (iii) Select the correct statement regarding hormone X.

- (a) X repairs the lining of the uterus and fallopian tube.
(b) X is increased with the increase in body temperature.
(c) X regulates maturation of only one follicle.
(d) Both (a) and (c)

- (iv) Duration of secretory phase of menstrual cycle is

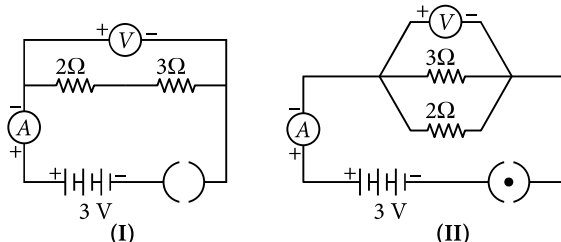
- (a) 1st to 5th day
(b) 15th to 28th day
(c) 6th to 14th day
(d) 1st to 14th day.

- (v) Menopause is the

- (a) onset of menstruation
(b) release of ovum from the ovary
(c) cessation of menstrual flow
(d) painful menstruation.

SECTION - B

10. How is magnetism helpful in medicine?
11. Find the voltmeter readings for the circuits I and II shown in figures.



OR

- (i) List the factors on which the resistance of a conductor in the shape of a wire depends.
- (ii) Why are metals good conductors of electricity whereas glass is a bad conductor of electricity? Give reason.
12. Identify the following parts :
- (i) A tubular duct in female reproductive system where the sperms encounter with the egg.
- (ii) An elastic bag-like structure in the female reproductive system with which the two oviducts unite.

OR

- (a) Define parthenogenesis.
- (b) Name two animals in which external fertilisation occurs.

SECTION - C

13. (i) (a) What is a 'homologous series' of substance?
- (b) In an organic compound, which parts largely determine its physical and chemical properties?
- (c) Compare the catenation property of carbon and silicon.
- (ii) Three hydrocarbons A, B and C have melting points -183°C , -138°C , and -95.3°C respectively. Which one has minimum number of carbon atoms in molecule?
14. Draw a labelled circuit diagram showing three resistors R_1 , R_2 and R_3 connected in series with a battery (E), a rheostat (Rh), a plug key (K) and an ammeter (A) using standard circuit symbols. Use this circuit to show that the same current flows through every part of the circuit. List two precautions you would observe while performing the experiment.
15. Mention some harmful effects caused by the non-biodegradable waste that we generate.

OR

Who proposed 10% law? What do this law states?

SECTION - D

16. The positions of three elements A, B and C in the periodic table are shown below :

Group 16	Group 17
-	-
-	A
-	-
B	C

- State whether *A* is metal or non-metal.
- State whether *C* is more reactive or less reactive than *A*.
- Will *C* be larger or smaller in size than *B*?
- Which type of ion, cation or anion will be formed by the element *A*?

OR

Study the following table in which positions of six elements *A*, *B*, *C*, *D*, *E* and *F* are shown as they are in the modern periodic table :

Group →	1	2	3-12	13	14	15	16	17	18
Period ↓									
2	<i>A</i>					<i>B</i>			<i>C</i>
3				<i>D</i>	<i>E</i>				<i>F</i>

On the basis of the above table, answer the following questions :

- Name the element which forms only covalent compounds.
- Name the element which is a metal with valency three.
- Name the element which is a non-metal with valency three.
- Out of *D* and *E*, which is bigger in size and why?
- Write the common name for the family to which the elements *C* and *F* belong.

17. Explain Mendel's experimental technique.

OR

Comment on determination of sex among human beings, with the help of a diagram.

ANSWERS

1. Biodegradable wastes are decomposed naturally by the action of microbes into their simple constituents and non-biodegradable wastes cannot be disposed off naturally since they cannot be decomposed by microbes. Such wastes are either recycled, incinerated or put in landfills, etc. As the disposal methods of the two types of wastes are different, it is advisable to discard the two types of waste in two separate dustbins.

OR

Green plants are called producers because they prepare their own food in the presence of sunlight and chlorophyll by the process of photosynthesis.

- When a tall pea plant is crossed with a short pea plant, the resultant progeny is always tall because tallness is a dominant trait while shortness is a recessive trait. Hence, dominant trait expresses itself in the progeny.
- The abiotic components of ecosystem are: temperature, soil, rainfall and minerals.
- Vegetative propagation is needed for growing those

plants which usually do not produce seeds or produce non-viable seeds.

- (b): Two consecutive members of a homologous series differ by a $-\text{CH}_2-$ group.

OR

(b)

- (d): Correct order is $\text{S} > \text{Cl} > \text{O} > \text{F}$.

7. (d): When current flows through a solenoid, the currents in the various turns of the solenoid are parallel and in the same direction. Since the currents flowing through parallel wires in the same direction lead to force of attraction between them, the turns of the solenoid will also attract each other and as a result, the solenoid tends to contract.

OR

(c) : According to Fleming's left hand rule, the direction of the magnetic force on a moving charge is always perpendicular to the magnetic field.

8. (i) (c) : Magnetic field inside infinite solenoid is uniform. Hence it is same at all points.

(ii) (c)

(iii) (c) : The pattern of the magnetic field associated with solenoid is same as the pattern of the magnetic field around a bar magnet.

(iv) (a) : For a long solenoid, magnetic field $B \propto In$; where I is the flowing current and n is number of turns per unit length in the solenoid. Therefore, in the given case magnetic field will remain unchanged.

(v) (a)

9. (i) (b) : In the given graph, X and Y represents estrogen and progesterone respectively.

(ii) (a) : In a female, progesterone plays an important role in the maintenance of uterine epithelium, therefore if it is insufficiently produced then uterine lining might not be sufficiently stable to support implanted embryo. During menstrual phase in female, level of progesterone hormone is reduced due to degeneration of corpus luteum. Estrogen is secreted by Graafian follicles under the influence of follicle stimulating hormone of anterior pituitary gland. Follicle stimulating hormone stimulates transformation of a primary follicle of ovary into Graafian follicle.

(iii) (d) : Estrogen stimulates repair and development of the lining of the uterus and fallopian tube. It also regulates maturation of only one follicle so that only one ovum is released at a time.

(iv) (b)

(v) (c) : Cessation of cycle of events in ovary and uterus around the age of 50 years and stoppage of menstrual flow is termed as menopause.

10. When we touch something, our nerves carry an electric impulse to the muscles we need to use, this impulse produced a temporary magnetic field. The magnetic field inside the body forms the basis of obtaining images of different body parts. This is done by using a technique called magnetic resonance imaging (MRI).

11. Only circuit II, with a dot within the symbol of the plug key, is a closed circuit in which current is flowing and will show non-zero voltage. The voltmeter reading, for the set up shown, in (II) would be (nearly) equal to the voltage of the battery (*i.e.* 3V).

OR

(i) Resistance of a conductor depends upon the following factors:

(a) Length of the conductor : Greater the length (l) of the conductor more will be the resistance (R).

$$R \propto l$$

(b) Area of cross-section of the conductor: Greater the cross-sectional area of the conductor, lesser will be the resistance.

$$R \propto \frac{1}{A}$$

(c) Nature of conductor.

(ii) Metal have very low resistivity and hence they are good conductors of electricity.

Whereas glass has very high resistivity so it is bad conductor of electricity.

12. (i) Oviduct (Fallopian tube)

(ii) Uterus

OR

(a) Parthenogenesis is the development of an organism from egg without fertilisation.

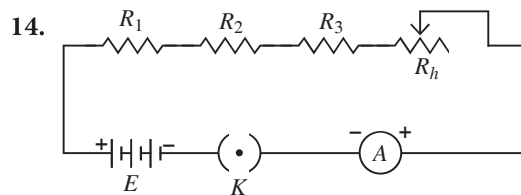
(b) In aquatic animals like fishes and amphibians, the gametes are shed outside the body and external fertilisation takes place.

13. (i) (a) 'Homologous series' is a series of compounds having same functional group, similar structural formula and similar chemical properties.

(b) Functional group determines chemical properties and length of carbon chain determines its physical properties.

(c) Carbon exhibits catenation property much more than silicon or any other element due to its smaller size which makes the C — C bonds exceptionally strong, while Si — Si bonds are comparatively weaker due to its large size.

(ii) 'A' will have the minimum number of carbon atoms in the molecule because it has minimum melting point. In general, melting point increases with increase in molecular mass. Hence one with the lowest molecular mass and hence lowest melting point, will have minimum carbon content.



By changing the positions of ammeter note the reading of ammeter each time, then you will find that all the readings obtained are same.

So, the value of the current in the ammeter is the same, independent of its position in the electric circuit. It means that in this circuit (series combination), the current is same in every part of the circuit.

Precautions:

- (a) All the connections should be neat and tight.
- (b) Ammeter should be connected with the proper polarity, *i.e.*, positive terminal of the ammeter should go to positive terminal and negative terminal of ammeter to the negative terminal of the battery or cell used.

15. Non-biodegradable waste does not decompose under the action of bacteria and other microorganisms. When these substances, *e.g.*, polythene, plastics are buried under soil they render that area barren and leads to soil pollution.

These wastes also do not burn completely in presence of oxygen and release toxic gases which causes air pollution.

OR

Lindeman proposed 10 percent law in 1942.

This law states that in an ecosystem, transfer of energy follows 10% law, *i.e.*, only 10 percent of the energy is transferred from one trophic level to the next level. The remaining 90% is lost in respiration and heat.

16. (a) Group 17 represents halogen family.

All the elements included in the family are non-metals. Therefore, element *A* is a non-metal.

(b) Reactivity of non-metals is generally due to the electron accepting tendency of their atoms. Down the group, the atomic size increases. Therefore, the attraction of the nucleus for the outside electrons decreases. This means that down the group of non-metals, reactivity decreases. Thus, element *C* is less reactive than the element *A*.

(c) Atomic size of the elements decreases along a period. The elements *B* and *C* are present in the same period. Since *C* is placed after *B*, the size of the element *C* is less than that of *B*.

(d) The element *A*, as pointed out earlier is a non-metal which belongs to group 17. It has seven valence electrons (2, 8, 7). In order to have the configuration of the nearest noble gas element, it will take up one electron and change to anion *i.e.*, A^- ion.

OR

(a) Element *E* will form only covalent compounds because it has 4 electrons in the outermost shell so, it can neither lose nor gain 4 electrons, hence *E* forms compounds by sharing of electrons.

(b) Element *D* is a metal having valency 3 as it belongs to group 13.

(c) *B* is a non-metal with valency $(8 - 5) = 3$.

(d) Out of *D* and *E*, *D* will be bigger in size because as we move from left to right in a period there is addition of extra electron in the same shell due to which electrons are pulled more closer to the nucleus.

(e) *C* and *F* belong to group 18 and are called noble gases.

17. Mendel conducted his breeding experiments in three steps. These steps are :

(i) Selection of pure breeding parent plants (*i.e.*, plants producing same phenotype and genotype in every generation).

(ii) Production of first generation of plants by cross breeding (hybridisation).

(iii) Raising of second and subsequent generations by self-fertilisation of hybrids.

While performing his cross breeding experiments, Mendel took a number of precautions. He always focused on the inheritance of the specific traits under consideration and simply ignored others.

In cross breeding experiments, to avoid self-fertilisation between two varieties or traits of plants, Mendel removed the anthers (male reproductive parts) of the flowers well before the maturity of the female reproductive part, *i.e.*, gynoecium of the flowers. This process is called emasculation. Such flowers were covered to avoid entry of any foreign pollen grain from outside by wind or animals. For making a desired cross, mature pollen grains from the anther of the flower of the desired plant were transferred on the stigma (female reproductive part) of the emasculated mature flower. The seeds formed by such crosses were collected. These seeds belonged to the first filial generation or F_1 generation. To draw effective conclusions, Mendel used the seeds of F_1 generation to raise the F_2 generation by self pollination and also the F_2 seeds for raising F_3 generation by self-pollination. He maintained all the records of his experiments.

OR

Diploid organisms like human beings have separate sexes. In organisms, where sex is determined genetically, a pair of chromosomes called sex chromosomes

determines the sex of the individual. All other chromosomes are termed autosomes. In human beings, there are 46 chromosomes. Out of these, one pair is of sex chromosomes which are of two types :

- (i) A male individual contains one X chromosome and one Y chromosome *i.e.*, XY.
 (ii) A female contains two X chromosomes *i.e.*, XX.

The sex of the child is determined at the time of fertilisation when male and female gametes fuse to form zygote. It can be given as :

