DESIGN OF QUESTION PAPER
SAMPLE QUESTION PAPER
X - SCIENCE (THEORY)

Time: 2½ Hours   **Max. Marks: 60**

The Weightage of marks for different topics of the content for the question paper shall be as under:

A.   Weightage to Content/Subject units

S. No	Content Unit	Marks
1.	Chemical Substances	18
2.	World of living	16
3.	Effects of current	10
4.	Light	08
5.		04
	Natural Resources :	
	(i) Sources of Energy 04	
	(ii) Our Environment and 04	04
	Management of Natural Resources	
	Total	**60**

B.   Weightage to forms of Questions

S. No.	Form of Questions	Marks for each question	No. of questions	Total Marks
1	Very short answer type (VSA)	01	09	09
2	Short answer type (SA I)	02	09	18
3	Short answer type (SA II)	03	06	18
4	Long answer type (LA)	05	03	15
	Total		**27**	**60**

C.   Number of Sections

The question paper will have two sections A & B

D.   Scheme of Options

There will be no overall choice. However, there is an internal choice in every question of five marks category.

E.   Weightage to difficulty level of questions

S. No	Estimated difficulty level of questions	Percentage
1.	Easy	15
2.	Average	70
3.	Difficult	15

F.   Typology of Questions

In order to assess different abilities related to the subject, the question paper includes open-ended questions, drawing/illustrations based questions, communication - skill based questions and activity-based questions.

About 20% Weightage has been assigned to questions testing higher order thinking skills of learners.

Form of Questions Unit	VSA (1 Mark)	SA–I (2 Marks)	SA–II (3 Marks)	LA (5 Marks)	Total
Chemical Substances	3(3)	4(2)	6(2)	5(1)	18(8)
World of Living	2(2)	6(3)	3(1)	5(1)	16(7)
Effects of current	1(1)	4(2)	—	5(1)	10(4)
Light	2(2)	—	6(2)	—	8(4)
Natural Resources	1(1)	4(2)	3(1)	—	8(4)
Total	**9(9)**	**18(9)**	**18(6)**	**15(3)**	**60(27)**

SAMPLE PAPER I

X - SCIENCE (THEORY)

Time: 2½ Hours   **Max. Marks: 60**

General Instructions:

1.   The question paper comprises of two sections A and B. You have to attempt both the sections.
2.   All questions are compulsory.
3.   There is no overall choice. However, internal choice has been provided in all the three questions of five marks category. Only one option in such questions is is to be attempted.
4.   All questions of section A and all questions of section B are to be attempted separately.
5.   Questions 1 to 6 in section A and 17 to 19 in section B are very short answer questions. These carry one mark each.
6.   Questions 7 to 10 in section A and 20 to 24 in section B are short answer type questions and carry two marks each.
7.   Questions 11 to 14 in section A and 25 to 26 in section B are also short answer type questions and carry three marks each.
8.   Questions 15 and 16 in section A and question 27 in section B are long answer type questions and carry five marks each.

SECTION A

1.   A ray of light LM is incident on a mirror as shown in the figure. The angle of incidence for this ray is the angle between it and the line joining two other points in the figure. Name these two points.

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2.   Metals generally occur in solid state. Name and write symbol of a metal that exists in liquid state at room temperature.   (1)
3.   During summer season, a milkman usually adds a very small amount of baking soda to fresh milk. Give one reason.   (1)
4.   The following table gives the values of refractive indices of a few media.

S. No.	1	2	3	4	5
Medium	Water	Crown Glass	Rock salt	Ruby	Diamond
Refractive Index	1.33	1.52	1.54	1.71	2.42

Use this table to give an example of a medium pair so that light speeds up when it goes from one of these media to another.   (1)
5.   Why do potato chips manufacturers fill the packet of chips with nitrogen gas?   (1)
6.   Generally alloys are used in electrical heating devices instead of pure metals. What could be the reason?   (1)
7.   Tooth enamel is one of the hardest substances in our body. How does it undergo damage due to eating chocolates and sweets? How do tooth pastes prevent this damage?   (2)
8.   A student has been collecting silver coins and copper coins. One day she observed a black coating on silver coins and green coating on copper coins. Give the chemical name of black and green coating. How are they formed? (2)
9.   Two students perform the experiments on series and parallel combinations of two given resistors R1 and R2 and plot the following V-I graphs. Which of two diagrams correctly represent the labels 'series and parallel' on the plotted curves? Justify your answer.   (2)
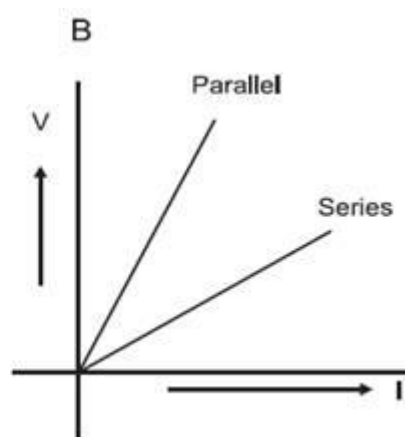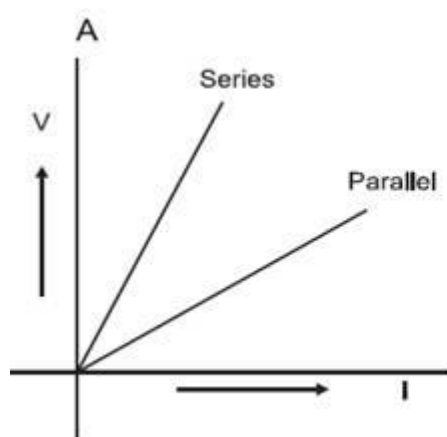
10.   Draw the pattern of magnetic field lines of a current carrying solenoid. What does the pattern of field lines inside the solenoid indicate? Write one application of magnetic field of current carrying solenoid.   (2)
11.   Out of two solar cookers, one was covered with a plane glass slab and the other was left open. Which of the two solar cookers will be more efficient and why?   (2)
12.   What is biogas? How is it obtained from biomass? Why is biogas considered an ideal fuel?   (2)
13.   A student finds the writing on the blackboard blurred and unclear when sitting on the last desk in the classroom. He however, sees it clearly when sitting on the front desk at an approximate distance of 2 m from the blackboard.

Draw ray diagrams to illustrate the formation of image of the blackboard writing by his eye-lens when he is seated at the (i) last desk (ii) front desk.

Name the kind of lens that would help him to see clearly even when he is seated at the last desk. Draw a ray diagram to illustrate how this lens helps him to see clearly. (3)

14. What is meant by reactivity series of metals? State which of the following chemical reactions will take place giving suitable reason for each.

Zn (s) + Cu SO$_4$ (aq) $\longrightarrow$ Zn SO$_4$ (aq) + Cu (s)

Fe (s) + Zn SO$_4$ (aq) $\longrightarrow$ Fe SO$_4$ (aq) + Zn (s)

Zn (s) + Fe SO$_4$ (aq) $\longrightarrow$ Zn SO$_4$ (aq) + Fe (s) (3)
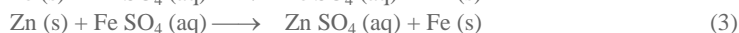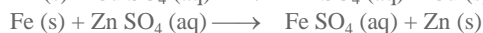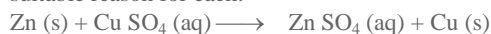
15. (a) Two lenses have power of (i) + 2D (ii) - 4D. What is the nature and focal length of each lens?
    (b) An object is kept at a distance of 100 cm from each of the above lenses.
    Calculate the (i) image distance (ii) magnification in each of the two cases. (3)

16. The following table shows the position of six elements A, B, C, D, E and F in the periodic table.

Groups Periods	1	2	3 to 12	13	14	15	16	17	18
2.	A					B			C
3.		D			E				F

Using the above table answer the following questions:

(a) Which element will form only covalent compounds?
(b) Which element is a metal with valency 2?
(c) Which element is a non-metal with valency 3?
(d) Write a common name for the family of elements C and F.
(e) Out of D and E, which one has a bigger atomic radius and why? (3)

17. An organic compound 'A' is widely used as a preservative in pickles and has a molecular formula C$_2$H$_2$O$_2$. This compound reacts with ethanol to form a sweet smelling compound 'B'.

(i) Identify the compound 'A'
(ii) Write the chemical equation for its reaction with ethanol to form compound 'B'.
(iii) How can we get compound 'A' back from 'B'?
(iv) Name the process and write corresponding chemical equation.
(v) Which gas is produced when compound 'A' reacts with washing soda?
Write the chemical equation. (5)

OR

(a) Why does carbon form largest number of compounds? Give two reasons.
(b) Why are some of these called saturated and other unsaturated compounds?
(c) Which of these two is more reactive?
(d) Write the names of the compounds:
    (i) CH$_3$ – CH$_2$ – Br   (ii)
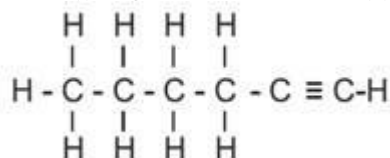
(5)

18. In a household electric circuit different appliances are connected in parallel to one another. Give two reasons.

An electrician puts a fuse of rating 5A in that part of domestic electrical circuit in which an electrical heater of rating 1.5kW, 220V is operating. What is likely to happen in this case and why? What change, if any, needs to be made? (5)

OR

You are given following current-time graphs from two different sources:
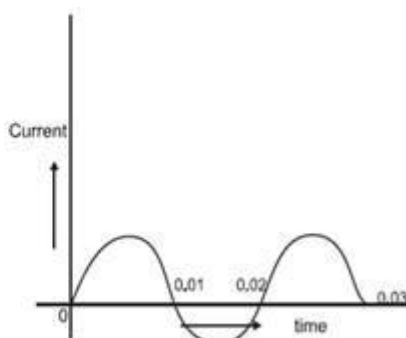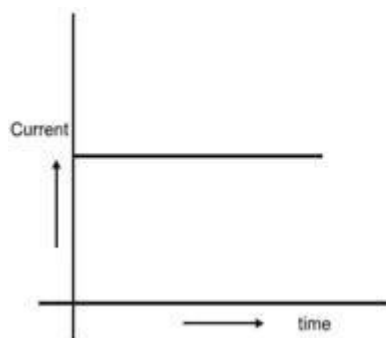
(i) Name the type of current in two cases.

(ii) Identify any one source for each type of these currents.
(iii) What is the frequency of current in case II in India?
(iv) Use above graphs to write two differences between the current in two   cases.
(v) What is the advantage of AC over DC?   (5)

SECTION B

19. Why do aquatic animals breath faster that the terrestrial animals?   (1)

20. Name one plant growth hormone which retards growth during extremely dry
season.   (1)

21. When plants are eaten by primary consumers, a great deal of energy is lost as heat to the environment and some amount goes in carrying out various life processes. State the average percentage of energy lost in this manner.   (1)

22. List the sequence of events that occur when a plant is exposed to unidirectional light, leading to bending of a growing shoot. Also name the hormone and the type of movement.   (2)

23. From the set of figures given below, make a pair of homologous and analogous organs each and give one reason in case of both, to justify your answer. (2)

Human forelimb   Bat Wing   Bird Wing
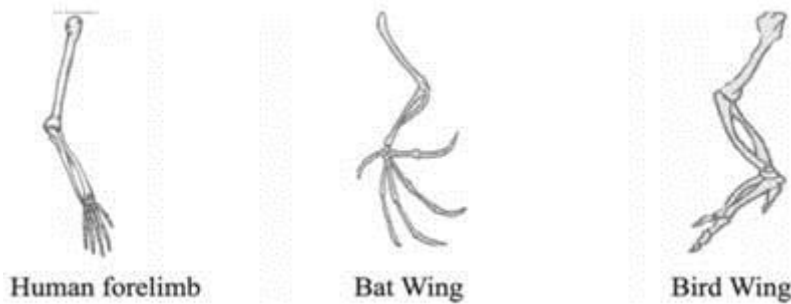
24. How is transport of water in xylem tissue different from translocation of food in phloem
tissue?   (2)

25. A group of grass hoppers – some green and some brown lived in grassland having dry bushes and dry
grass.   (3)
(a) Which one would normally be picked up by predatory birds and why?
(b) Population of which grasshopper will increase?
(c) Name this phenomenon

26. Make an aquatic food chain up to tertiary consumer level. State the trophic level at which concentration of pesticide is maximum and why?   (3)

27. Identify male and female in the figures given below. Also fill in the blanks 3 to 8 and then clarify about the misconception that mother and not father is responsible for bearing daughters and not sons.
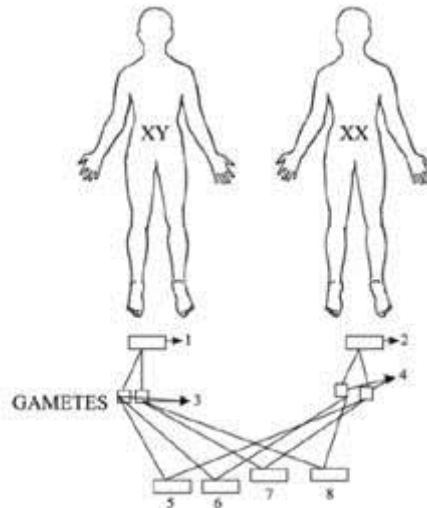
OR
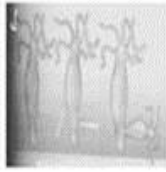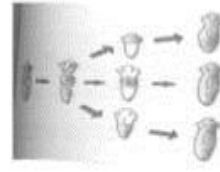
A   B   C   D

1.   Identify the organisms in figure A, B, C and D.
2.   Identify the life process commonly shown in all the figures.
3.   How is this life process advantageous to the organisms? Mention any two
advantages.   (5)

Q. No.   **Marks**

SECTION A

1.   M and C   1
2.   Mercury / Hg   1
3.   Being alkaline, baking soda neutralizes the lactic acid formed in the milk and prevents its spoilage.
4.   Any pair of media from higher refractive index to lower refractive index says medium 2 to
1.   1
5.   To provide an inert atmosphere to prevent chips from getting oxidised. 1
6.   Alloys have high melting point. / Do not oxidize (burn) readily at high
temperature.   1
7.   Tooth enamel is made up of calcium phosphate which gets corroded when the pH in the mouth is below 5.5. Bacteria present in the mouth produce acids by degradation of sugar in the mouth after eating. Tooth pastes which contain bases, neutralize the acid formed.   2
8.   Black coating: Silver sulphide.   ½
Green coating: Copper carbonate   ½
By the action of
(i) H_2S or sulphur compounds present in the atmosphere.   ½
(ii) Atmospheric carbon dioxide   ½
9.   A is correct   1
As effective resistance is greater in series combination compared to parallel combination, V/R will be less for series combination; hence strength of the current will be lower for series combination.   1
10.   Pattern of magnetic field lines   ½
It indicates that the magnetic field is the same at all points inside the solenoid
                                                                                                        1

For making an electromagnet   ½
11.   The solar cooker with the glass slab: as the heat gets trapped within the cooker and the temperature of the cooker rises. It rises more than the uncovered cooker/green house effect.   2
12.   Biogas is a mixture of methane, carbon dioxide, hydrogen and hydrogen
sulphide.   ½

   Biogas is obtained by anaerobic decomposition of biomas. ½
1.   Heating Capacity high
2.   Burnes without smoke
3.   Leaves no residue   ½ x 2
4.   Slurry left behind can be used as manure
13.   Correct Ray Diagrams   ½ , ½
Concave lens / Correct ray diagram   ½ , ½
14.   Reactivity series is a list of metals arranged in the order of their decreasing
activities   1
(a)   Reaction will take place because Zn is above Cu in the activity
series   1
(b)   Reaction will not take place as Fe is below Zn in the activity series and cannot displace Zn from its
compound.   1
15.   (a)   (i)   +50 cm, convex lens   ½ + ½
(ii)   −25 cm, concave lens
(b)   (i)

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

$$v = +100\,cm, m = 1$$

        (ii)   61 32 src="/media/images/library/maths/SQPMS_Science Theory_X-Paper_1-2010_files/image017.gif" v:shapes="_x0000_i1025">
16.   (a)   E   ½
(b)   D   ½
(c)   B   ½

(d)   Noble Gases /Inert Gases   ½
(e)   D, atomic radius decreases with greater nuclear charge in the same
period   ½, ½
17.   (i)   Ethanoic acid / Acetic acid   1
(ii) $CH_3COOH + C_2H_5OH à CH_3COOC_2H_5 + H_2O$ 1
(iii)   Saponification
$CH_3COOC_2H_5 \ NaOH à C_2H_5OH + CH_3COOH$ ½+½
(iv) CO_2 GAS   1
$2CH_3COOH + Na_2CO_3 à \ 2CH_3COONa + H_2O + CO_2$ 1

OR

(a)   Due to the property of Catenation. Carbon has unique property to form bonds with other carbon
atoms.   1
(b)   Saturated compounds are those in which all the valencies of carbon atoms are satisfied by single bond between
them.   1
In unsaturated compounds, the valency per carbon atom remains unsatisfied. Thus there is a double bond between carbon
atoms. 1
(c)   Unsaturated hydrocarbon   1
        (d)   (i)   Bromoethane   ½ + ½
(ii)   Hexyne
18.   (i)   The appliances can be operated independently.   ½
(ii)   They get the same applied voltage   ½
The fuse will not blow off even if the current in these devices were to exceed their safe current value.
This could damage these devices and even cause fire.   3
Any fuse of lower amperage needs to put in the circuit.   1

OR

(i)   I: Direct current;   II: Alternating current   1
(ii)   I: Dry cell;   II: Alternating current generator   1
(iii)   I: Zero;   II: 50 cycles per second   1
(iv)   I: Direction remains constant and value of current remains same. ½
II: In case of AC both the value as well as the direction of the current
changes.   ½.
(v)   Power can be transmitted over long distances without much loss of
energy.   1

SECTION - B

19.   Because the dissolved oxygen is fairly low in water compared to the amount of oxygen in the
air.   ½+½
20.   Abscisic acid   1
21.   90%   1
22.   - Auxin diffuses towards shady side.   ½+½
- Causes elongation on one side (shady side) resulting in bending.   ½
- Phototropic movement   ½
23   Bird wing and Bat wing – Analogous,   ½
Structures different but functions same,   ½
Human forelimb and Bird wing - Homologous,   ½
Structure same but functions different.   ½
24   Physical forces (like transpiration pull & root pressure) help in transport of water in xylem while translocation of
food in phloem is achieved by utilizing energy.// No energy required for water transport in xylem, energy required for
translocation of food in phloem   1+1
25   a)   Green grass hopper, because they stand out, against brown   background of dry
bushes.   ½+½+½
b)   Brown   ½
c)   Natural selection.   1
26   E.g. Phytoplankton? Zooplankton? Small fish? Bird   ½×4=2
(any other suitable example of aquatic food chain)
Tertiary consumer (e.g. Bird)   ½
Pesticides are not degradable & get progressively accumulated at each trophic
level.   ½
27.   1. Male
2. Female
3. X and Y
4. X and X
5. XX
6. XX

7. XY

8.   XY   ½×8=4

A child who inherits 'X' chromosome from father will be a girl and the one who inherits 'Y' chromosome from father will be a boy.   1

OR

1.   A.   Hydra
B.   Fungi
C.   Bryophyllum
D.   Planaria   ½× 4=2
2.   Asexual mode of reproduction   1
3.   • Only one individual is required
• Progeny is identical like parents
• Produced in large number (any other valid point) (Any two) 1×2=2