CBSE Sample Paper-02
SCIENCE (Theory)**Class – X**

Time allowed: 3 hours Maximum Marks: 90

General Instructions:

a) All questions are compulsory.
b) The question paper comprises of two sections, A and B. You are to attempt both the sections.
c) Questions 1 to 3 in section A are one mark questions. These are to be answered in one word or in one sentence.
d) Questions 4 to 6 in section A are two marks questions. These are to be answered in about 30 words each.
e) Questions 7 to 18 in section A are three marks questions. These are to be answered in about 50 words each.
f) Questions 19 to 24 in section A are five marks questions. These are to be answered in about 70 words each.
g) Questions 25 to 27 in section B are 2 marks questions and Questions 28 to 36 are multiple choice questions based on practical skills. Each question of multiple choice questions is a one mark question. You are to select one most appropriate response out of the four provided to you.

Section A

1. What happens when Hydrogen combines with Oxygen in the presence of an electric current?
2. Why is nutrition necessary for an organism?
3. Why is tungsten metal selected for making filaments of incandescent lamp bulbs?
4. Write two observations you would make when quicklime is added to water.
5. Where does cerebrospinal fluid occur in our body? Mention any two of its functions.
6. Draw a sketch of the iron fillings as you spray them on a magnet.
7. (a) What is an ionic equation? Give an example.
   (b) Write the name of following compounds:
   (i) $Mn(OH)_2$ (ii) $FeCl_3$
8. (a) What is Double displacement reaction? Give an example.
   (b) Write balanced equation:
   Sodium + Water $\longrightarrow$ Sodium hydroxide + Hydrogen
9. (i) What is the action on litmus of:
   (a) Dry ammonia gas. (b) Solution of ammonia gas in water
   (ii) State the observations you would make on adding ammonium hydroxide to aqueous solutions of (a) Ferrous sulphate, (b) Aluminium chloride.

10. What is an alloy? Name the constituents of 22-carat gold. Why is 24-carat gold converted to 22-carat gold?
11. State reasons for the following:
    (a) Aluminium oxide is called an amphoteric oxide.
    (b) Sodium and potassium metals are kept immersed under kerosene oil.
    (c) Hydrogen gas is not evolved when most metals react with nitric acid.
12. List two vital functions of the human kidney. Draw a labelled diagram of an artificial kidney.
13. Explain the process by which inhalation occurs during breathing in human beings.
14. Draw a diagram showing endocrine glands in a human male body. Label the following glands on it:
    (a) Pituitary (b) Thyroid (c) Adrenal (d) Testes
15. Name the unit used in selling electrical energy to consumers. Two lamps, one rated 100 W at 220 V and the other 40 W at 220 V are connected in parallel to a 220 V mains supply. Calculate the electric current drawn from the supply line.
16. Draw the pattern of lines of force due to magnetic field associated with a current carrying straight conductor. State how the magnetic field produces changes:
    (i) with an increase in current in the conductor and
    (ii) the distance from the conductor
17. Vinod went to his ancestral village alongwith his father during the summer holidays. He found that the women of the village used dried cow-dung cakes (uple) as the fuel to cook food and for other heating purposes. One day Vinod went to Panchayat meeting in a village which is attended by all the village elders and requested them to install "Gobar Gas plant" in the village and used cow-dung in it to produce gobar gas, instead of burning cow-dung cakes directly. He explained the advantages of using the gobar gas as a fuel instead of cow-dung cakes. Everyone liked the idea and thanked Vinod for guidance.
    Read the above passage and answer the following questions:
    (a) State one disadvantage of using dried cow-dung cakes as a fuel for cooking food.
    (b) State one advantage of using gobar gas as a fuel for cooking food.
    (c) What values are displayed by Vinod in this whole episode?

    [Value Based Question]
18. (a) Write the principle of generation of electric power by a boiling water type nuclear reactor. Name the coolant used in such a reactor.
    (b) Explain the process of generation of energy in the Sun and name the scientist who was first to propose it.
19. Translate the following statements into chemical equations and then balance them:
    (a) Hydrogen gas combines with nitrogen to form ammonia.
    (b) Hydrogen sulphide gas burns in air to give water and sulohur dioxide.
    (c) Barium chloride reacts with aluminiumsulphate to give aluminium chloride and a precipitate of barium sulphate.
    (d) Potassium metal reacts with water to give potassium hydroxide and hydrogen gas.
    (e) Hydrogen sulphide gas reacts with oxygen gas to form solid sulphur and liquid water.

Or

Write the difference between Displacement reaction and Double displacement reactions. Write equations for these reactions also.

20. Four metals A, B, C and D are, in turn, added to the following solutions one by one. The observations made are tabulated below:

Metal	Iron (II) Sulphate	Copper (II) Sulphate	Zinc Sulphate	Silver Nitrate
A	No reaction	Displacement	---------	---------
B	Displacement	---------	No reaction	---------
C	No reaction	No reaction	No reaction	Displacement
D	No reaction	No reaction	No reaction	No reaction

Answer the following questions based on above information:

(i) Which is the most active metal and why?

(ii) What would be observed if B is added to a solution of Copper (II) sulphate and why?

(iii) Arrange the metals A, B, C and D in order of increasing reactivity.

(iv) Container of which metal can be used to store both Zinc sulphate and Silver nitrate solution?

(v) Which of the above solutions can be easily stored in a container made up of any of these metals?

Or

You are given the following materials:

(i) Iron nails (ii) Copper sulphate solution (iii) Barium chloride solution

(iv) Copper powder (v) Ferrous sulphate crystals (vi) quick lime

Identify the type of chemical reaction taking place when:

(a) Barium chloride solution is mixed with copper sulphate solution and a white precipitate is observed.

(b) On heating copper powder in air in a China dish, the surface of copper powder turns black.

(c) On heating green coloured ferrous sulphate crystals, reddish brown solid is left and smell of a gas having odour of burning sulphur is experienced.

(d) Iron nails when left dipped in blue copper sulphate solution become brownish in colour and the blue colour of copper sulphur fades away.

(e) Quick lime reacts vigorously with water releasing a large amount of heat.

21. How is 'Respiration' is different from 'Breathing'? Explain the process of 'Aerobic respiration' and 'Anaerobic respiration'.

Or

Draw a diagram showing 'Human respiratory system'. Label its following parts:

(i) Larynx (ii) Trachea (iii) Primary Bronchus (iv) Lungs

Why do the walls of the trachea not collapse when there is less air in it?

22. A household uses the following electric appliances:

(i) Refrigerator of rating 400 W for 10 hours each day.

(ii) Two electric fans of rating 80 W each for 6 hours daily.

(iii) Six electric tubes of rating 18 W each for 6 hours daily.

Calculate the electricity bill for the household for the month of June if cost electrical energy is 3.00 per unit.

Or

(i) The potential difference between two points in an electric circuit is 1 volt. What does is mean? Name a device that helps to measure the potential difference across a conductor.

(ii) Why does the connecting cord of an electric heater not glow while the heating element does?

(iii) Electric resistivities of some substances at 20^{o} C are given below:

Silver	$1.60\times10^{-8}\Omega$ m	Copper	$1.62\times10^{-8}\Omega$ m
Tungsten	$5.2\times10^{-8}\Omega$ m	Iron	$10.0\times10^{-8}\Omega$ m
Mercury	$94.0\times10^{-8}\Omega$ m	Nichrome	$100\times10^{-6}\Omega$ m

Answer the following questions using above data:

(a) Among Silver and Coper, which one is a better conductor and why?

(b) Which material would you advise to be used in electrical heating devices and why?

23. State Fleming's Left hand rule. With a labelled diagram, describe the working of an electric motor. What is the function of split ring commutator in motor?

Or

Explain with a neat diagram, the principle, construction and working of an A.C. generator.

24. What are magnetic field lines? How will you draw them? Write their characteristics.

Or

Show a domestic electric circuit with fuse, a bulb and a geyser from main electric line. Indicate also the capacity of fuse used for geyser and the bulb.

SECTION – B

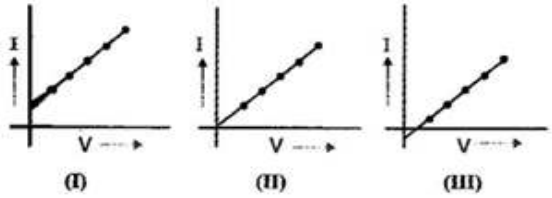
25. If we mix equal volume of 1 M NaOH solution with 1 M solution of HCl and then if we add blue litmus into it, then what will be the change in litmus paper? Write the chemical reaction involved.

26. In an experiment on photosynthesis, a student fixed a strip of black paper on the dorsal surface of a Bougainvillea leaf in the morning. In the evening she tested the leaf for starch.

(a) What will be the result?

(b) Justify your answer

27. In the experiment on studying the dependence of current (I) on the potential difference (V), three students plotted the following graphs between (V) and (I) as per their respective observations.



(a) Which observation is correct?
(b) Justify your answer.

28. Four students I, II, III and IV were asked to examine the changes for blue and red litmus paper strips with dilute HCl (solution A) and dilute NaOH (solution B). The following observations were reported by the four students. The sign $(-)$ indicating no colour change.

(I)

Litmus	A	B
Blue	----	Red
Red	----	Blue

(II)

Litmus	A	B
Blue	Red	----
Red	----	Blue

(III)

Litmus	A	B
Blue	Red	Red
Red	Blue	Blue

(IV)

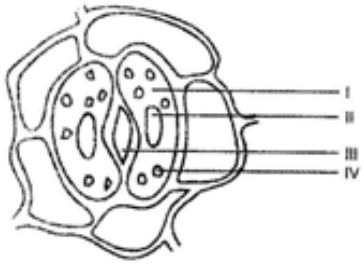
Litmus	A	B
Blue	Blue	Blue
Red	Red	Red

The correct observation would be of the student:
(a) I (b) II (c) III (d) IV

29. The apparatus should be kept air tight because:
(a) SO_2 is lighter than air.
(b) SO_2 is soluble in water.
(c) SO_2 will escape from the gaps.
(d) SO_2 is poisonous.

30. When acidified potassium dichromate solution is added to a jar containing sulphur dioxide gas, the solution becomes:
(a) colourless (b) brown (c) dark orange (d) green

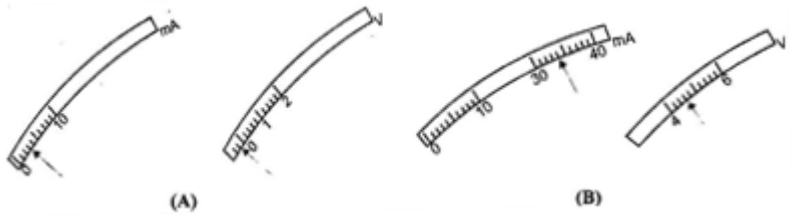
31. Which structure out of I, II, III and IV marked in the given diagram of the epidermal peel of leaf should be labelled as stoma:



(a) I (b) II (c) III (d) IV

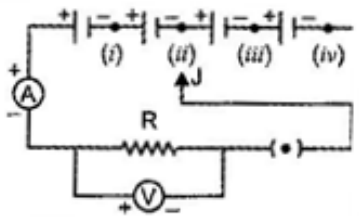
32. Phototropism : Shoots : Geotropism : _____
(a) Leaves (b) Flowers (c) Roots (d) Shoots

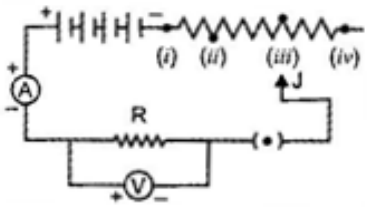
33. The rest positions of the needles in a Milliammeter and Voltmeter were shown in figure A. When a student used these in her experiment, the final readings of the needle were in the position shown in figure B.



The correct readings of the two instruments are:
(a) 34 mA and 4.2 V respectively (b) 37 mA and 4.8 V respectively
(c) 31 mA and 4.8 V respectively (d) 31 mA and 4.2 V respectively

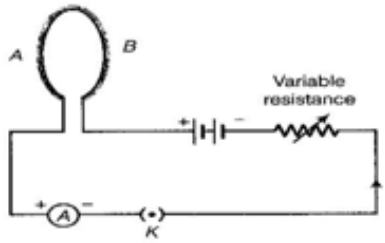
34. To study the dependence of current (I) on the potential difference (V) across a resistor, two students used the two set ups shown in figure (A) and (B) respectively. They kept the contact J in four different positions, marked (i), (ii), (iii), (iv) in the two figures.

(a)


(b)


For the two students, their Ammeter and Voltmeter readings will be minimum when the contact J is in the position:
(a) (i) in both the set ups.
(b) (iv) in both the set ups.
(c) (iv) in set up (A) and (i) in set up (B)
(d) (i) in set up (A) and (iv) in set up (B)

35. A circular loop placed in a plane perpendicular to the place of paper carries a current when the key is ON. The current as seen from points A and B (in the plane of paper and on the axis of the coil) is anti-clockwise respectively. The magnetic field lines from B to A. The N-pole of the resultant magnet is on the face close to:



(a) A
(b) B
(c) A, if the current is small and B, if the current is large.
(d) B, if the current is small and A, if the current is large.

36. In a hydro power plant:
(a) Potential energy possessed by stored water is converted into electricity.
(b) Kinetic energy possessed by stored water is converted into potential energy.
(c) Electricity is extracted from water.
(d) Water is converted into steam to produce electricity.