

## KENDRIYA VIDYALAYA SANGATHAN

## MUMBAI REGION

## SECOND PREBOARD EXAMINATION 2009-2010

## CLASS – X

## SUBJECT – SCIENCE AND TECHNOLOGY (SET I)

TIME:  $2\frac{1}{2}$  hrs

Max Marks: 60

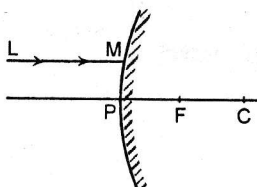
**General Instructions:**

1. The question paper comprises of two sections A and B. You are to attempt both the sections.
2. All questions are compulsory.
3. There is no overall choice. However internal choice has been provided in some questions of five marks category. Only one option in such questions is to be attempted.
4. Questions 1 to 6 in section A and 17 to 19 in section B are short questions. These carry one mark each.
5. Questions 7 to 10 in section A and 20 to 24 in section B are short answer type questions and carry two marks each.
6. 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.
7. 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'**

Q.1 A ray of light LM is incident on a mirror as shown in the figure.

Show the angle of incidence.



Q.2 What are metalloids? Give an example.

Q.3 Why should plaster of paris be stored in a moisture proof container?

Q.4 The following table gives the values of refractive indices of a few liquid media:

S.No.	1	2	3	4	5
Medium	Alcohol	Benzene	Kerosene	Water	Turpentine
Refractive index	1.36	1.50	1.44	1.33	1.47

Light passes through these media one by one. Arrange the given media in the increasing order of the speed of light.

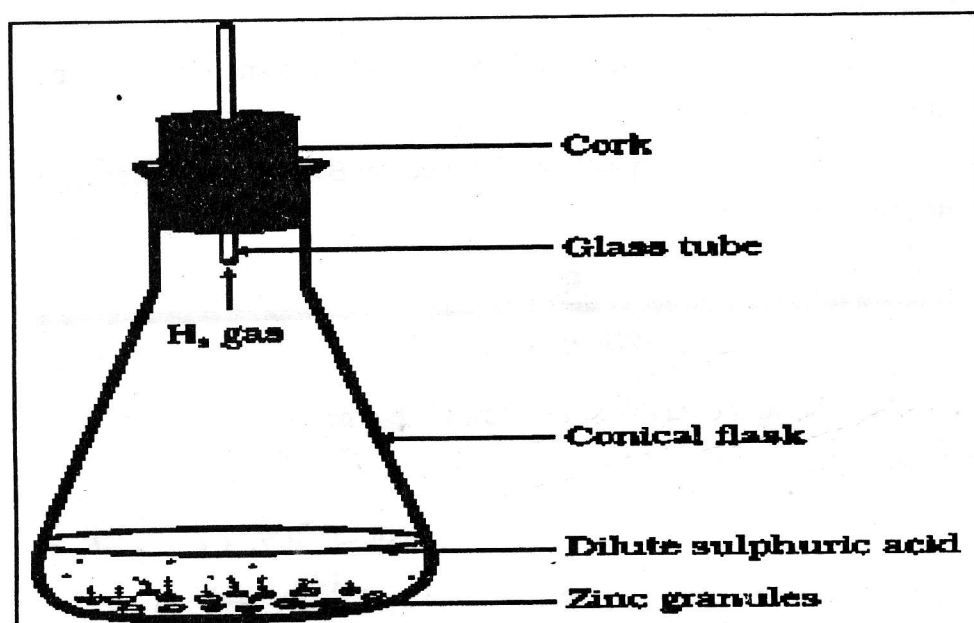
*Benzene < Turpentine < Kerosene < Alcohol < Water*

Q.5 A substance X used for coating iron articles is added to a blue solution of a reddish brown metal Y, the color of the solution gets discharged. Identify X and Y & also the type of reaction.



Q.6 A charge of 2C moves between two plates, maintained at a p.d of 1V. What is the energy acquired by the charge? *W = V.Q*

Q.7 Observe the following activity & answer the questions.



a. Do you observe anything happening around the zinc granules?

- b. Will there be any change in its temperature?  
 c. Why is glass tube not dipped in dil  $H_2SO_4$ ?  
 d. How is  $H_2$  gas collected by downward displacement or upward displacement of water?

Q.8 Give reasons why:

- (i) Platinum, gold and silver are used to make jewellery.  
 (ii) Sodium and potassium are stored under kerosene oil.

Q.9 Draw a schematic diagram of a circuit containing the following electrical Components :( a) a resistance (c) an electric bulb (d) a cell (f) plug key to show a closed circuit.

Q.10 Draw the pattern of magnetic field lines of a current carrying circular loop. On what factor does the strength of the magnetic field in a circular coil depends?

Q.11 A child sitting on the first bench in a classroom finds it difficult to see the blackboard. Identify the defect. How will you rectify the defect and also draw the diagram.

Q.12 Why does the fried food become "Rancid"? How can we prevent it from turning 'Rancid'? Name the component of food which is responsible for the rancidity.

Q.13 In the periodic table given below lithium, carbon, oxygen and neon have been placed in their correct positions. The positions of nine other elements have been represented by letters X, Y, Z, E, G, L, Q, R, and T. These letters are not the symbols for the elements concerned. By reference to the table answer the following questions:

	1	2	3 to 12	13	14	15	16	17	18
Period 2	Lithium				Carbon		Oxygen	L	Neon
Period 3	X				E		G	Q	
Period 4	Y							R	
Period 5	Z							T	

(a) Give the letter of the most reactive metal. Z

- (b) Give the letter of the most reactive non-metal. **L**
- (c) Name the family of elements represented by L, Q, R, and T. **Halogens**
- (d) Arrange the elements Z, Q, R, and Y in the increasing order of their size.  
**Q < R < Y < Z**
- (e) Write the formula of the compounds formed when
- (i) Y reacts with G  **$Y_2G$**
- (ii) E reacts with Q  **$EQ_2$**

Q.14 A convex mirror used for rear-view on an automobile has a radius of curvature of 3.00 m. If a bus is located at 5.00 m from this mirror, find the position, nature and size of the image.

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

$$\frac{1}{v} = \frac{1}{1.5} - \frac{1}{-5}$$

$$= \frac{1}{1.5} + \frac{1}{5}$$

$$v = \frac{7.5}{6.5}$$

$$= 1.15 \text{ m}$$

$$m = \frac{h'}{h} = -\frac{v}{u}$$

$$= -\frac{1.15}{-5}$$

$$= 0.23$$

Q.15 An organic compound 'A' is a constituent of wine and cough syrup. This compound on heating with alkaline potassium permanganate forms another organic compound 'B'. Compounds 'A' and 'B' react with each other to form a sweet smelling substance 'C'.

- (i) Identify the compounds 'A', 'B' and 'C'.
- (ii) Write the chemical equation for the conversion of A into B.
- (iii) Name and write the chemical reaction taking place between A and B.
- (iv) Name the process to get compound 'B' back from 'C' and write corresponding chemical equation.
- (v) What happens when A burns in the presence of oxygen? Write the chemical equation.

Or

- (b) Name the structure formed when soap is mixed in water.
- (c) Draw its labeled diagram to show the structure.
- (d) Explain the formation of scum when hard water is treated with soap?
- (e) What change will you observe if you test soap with litmus paper (red and blue)?

$$x \times 100 = 40$$

$$x = \frac{40}{100}$$

(N X 2)

$$x \times 120 = 100$$

$$x = \frac{100}{120}$$

$$x =$$

(f) Would you be able to check if water is hard by using a detergent?

Q.16 In a household electric circuit different appliances are connected in parallel to one another. Give two reasons.

Two electric lamps rated 100W; 220V and 25W; 220V are connected in parallel to a 220V supply. Calculate the total electric current flowing through the circuit.

SECTION 'B'

Q.17 What advantage over a fish does a bird have with regard to obtaining oxygen for respiration?

Q.18 Which gland secretes a hormone that prepares an animal to fight or to flight? Where is this gland located?

Q.19 Why are solar cells expensive to build? Give two reasons.

Q.20 Chloroplast is called energy convertor. Explain.

Q.21 Give any two ways in which non-biodegradable substances would affect the environment?

Q.22 Will geographical isolation be a major factor in the speciation of a self-pollinating plant species? Why or why not?

Q.23 Study carefully the food chains given below:

Food chain I: grass  $\rightarrow$  grasshopper  $\rightarrow$  frog

Food chain II: wheat  $\rightarrow$  rat  $\rightarrow$  snake  $\rightarrow$  hawk

To which of the two consumers frog or hawk will more energy (percent) be available and why?

Q.24 What do the following transport?

(i) Hemoglobin (ii) blood plasma (iii) pulmonary artery (iv) aorta

Q.25 Mention the harmful effects of burning fossil fuels such as coal and petroleum.

2

3

$$P = IV$$

$$R = \frac{V^2}{P}$$

$$R = 387.2 \Omega$$

$$I = 0.568 A$$

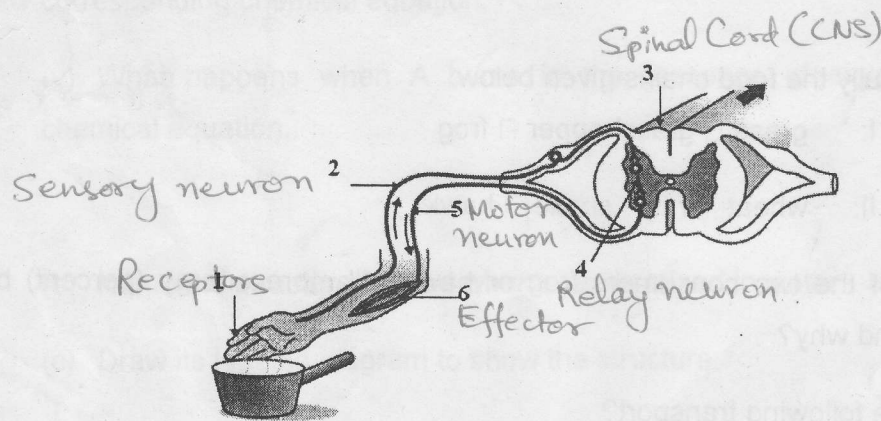
Q.26 Why does menstruation occur in females? Also draw a well-labeled diagram of human female reproductive system.

Q.27 Study the given data and answer the questions following the data.

Parental plants fertilised & collected	cross & seeds	F <sub>1</sub> (first generation offspring)	F <sub>2</sub> (offspring of self pollination of F <sub>1</sub> )
Male parent always bore red flowers. Female parent always had white flowers.		330 seeds sown and observed. All 330 gave red flowers	Out of 44 seeds 33 seeds gave plants with red flowers and 11 seeds gave plants with white flowers.

- What is the term for this type of cross?
- What does the data of the column marked F<sub>1</sub> indicate?
- Express the genotype of the (a) parents (b) F<sub>1</sub> Progeny and (c) F<sub>2</sub> Progeny

OR



Label the diagram and trace the sequence of events, which occur when bright light is focused on your eye.