INDIAN SCHOOL AL WADI AL KABIR

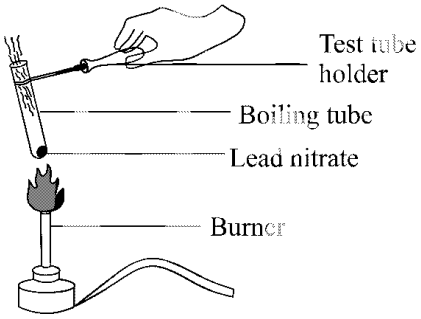
PRE-MIDTERM (2023 - 24)

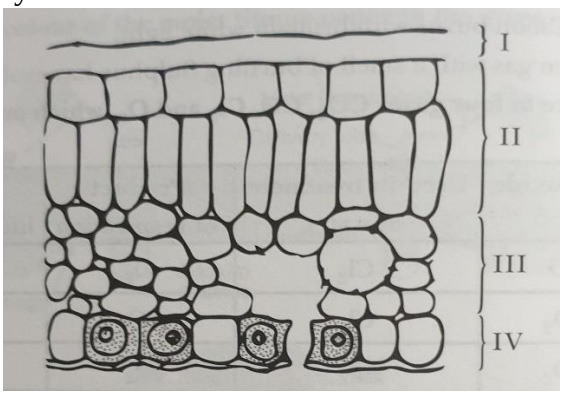
Class: X Sub: SCIENCE (086) Max Marks: 30

Date:21.05.2023 Set - 2 Time : 1 hour

General Instructions:

i) All the questions are compulsory.
ii) The question paper has five sections and 14 questions.
iii) Section–A has 6 questions of 1 mark each; Section–B has 2 questions of 2 marks each. Section–C has 2 questions of 3 marks each. Section–D has 1 question of 5 marks and Section E has 3 case-based questions of 3 marks each.
iv) Internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

NO	QUESTIONS	MARKS
	SECTION A	
1	Rays from sun converge at a point 15 cm in front of a concave mirror. Where should an object be placed so that size of the image is exactly equal to the size of the object? (a) 30 cm in front of mirror (b) 15 cm in front of mirror (c) between 15 cm and 30 cm in front of mirror (d) Less than 15 cm in front of mirror	1
2	Which of the following is the correct observation for the thermal decomposition reaction of lead nitrate as shown in the below set up?  (a) Brown powder is formed. (b) Colourless gas which turns lime water milky is evolved. (c) A white precipitate is formed. (d) Brown fumes of nitrogen dioxide is evolved.	1

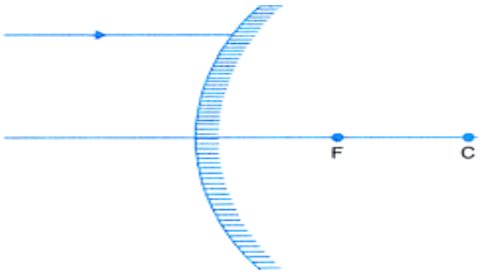
3	In the given transverse section of leaf identify the layer of cells where maximum photosynthesis occurs.  (a) I, II (b) II, III (c) III, IV (d) I, IV	1

For question numbers 4, 5 and 6, 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:

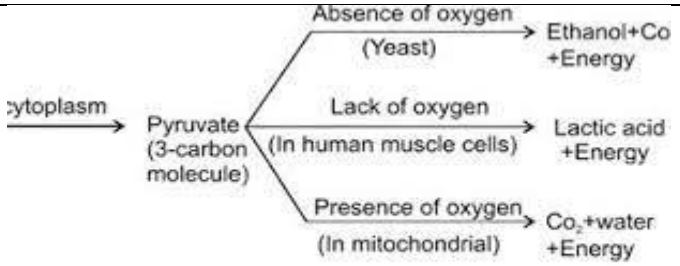
a) Both A and R are true, and R is correct explanation of the assertion.
b) Both A and R are true, but R is not the correct explanation of the assertion.
c) A is true, but R is false.
d) A is false, but R is true.

4	**Assertion (A):** Concave mirrors are used as make-up mirrors. **Reason(R):** When the face is held within the focus of a concave mirror, then a diminished image of the face is seen in the concave mirror.	1
5	**Assertion (A):** In the following reaction $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$ Fe_2O_3 undergoes reduction **Reason(R):** Aluminium is a reducing agent that reduces Fe_2O_3 to Fe.	1
6	**Assertion (A):** Raw materials needed for photosynthesis are carbon di-oxide, water and minerals. **Reason(R):** Nutrients provide energy to the body.	1
	SECTION B	
7	List two observations that are noticed when an iron nail is put inside copper sulphate solution. Write chemical equation for the reaction that occurs.	2
8	List two characteristics of lungs that make it an efficient respiratory surface. OR How are the alveoli designed to maximise the exchange of gases?	2

	SECTION C	
9	On heating copper powder in air, the surface of copper powder becomes coated with black CuO. How can this black coating be converted into brown copper? Write the chemical equations for the above reactions. Also identify the type of reaction. OR On heating Ferrous sulphate in a boiling tube, ferric oxide, Sulphur dioxide and Sulphur trioxide are formed. a) Write a balanced chemical equation of the reaction b) Write any two observations during the reaction. c) Identify the type of reaction.	3
10	What are the different ways in which glucose is oxidized to provide energy in various organisms, explain with the help of flowchart.	3
	SECTION D	
11	a) An object 4 cm in height, is placed at 15 cm in front of a concave mirror of focal length 10 cm. At what distance from the mirror should a screen be placed to obtain a sharp image of the object. Calculate the height of the image. b) Define radius of curvature of spherical mirrors. Find the nature and focal length of a spherical mirror whose radius of curvature is +24 cm. OR a) Name the type of mirrors used in the design of solar furnaces. Explain how high temperature is achieved by this device. b) The linear magnification produced by a spherical mirror is +3. Analyse this value and state the (i) type of mirror and (ii) position of the object with respect to the pole of the mirror. Draw a ray diagram to show the formation of image in this case.	5
	SECTION E	
12	Rear view mirror is device that allows the driver to see rearward. It usually finds its place at the top of windscreen in side of the cabin. This device is one of the most basic but essential safety devices in the vehicle. It provides assistance to the driver during overtaking, parking in reverse gear etc. Generally, vehicles also have pair of mirrors attached the body from outside. They are popular as "side mirrors" or Outer Rear View Mirrors (ORVM) which serve the same purpose. Almost all modern cars mount their side mirrors on the doors –normally at a pillar rather than wings . 	3

	a) Define principal focus of a convex mirror b) A ray of light is incident on a convex mirror as shown in Fig. Redraw the diagram after completing the path of the light ray after reflection from the mirror.  c) An object is placed at a distance of 30 cm in front of a convex mirror of focal length 15 cm. Write two characteristics of the image formed by the mirror.	
13	Oxidation has damaging effect on metals as well as on food. Corrosion is the process in which metals are eaten up gradually by the action of air, moisture or any other substance present in atmospheric air. a) Define rancidity. b) List any two methods to prevent rancidity. c) What is corrosion of iron known as? Explain.	3
14	Digestion is the complex process of turning the food you eat into nutrients, which the body uses for energy, growth and cell repair needed to survive. The digestion process also involves creating waste to be eliminated. The main organs that make up the digestive system are the mouth, large intestine, small intestine, oesophagus, stomach, rectum and anus. Helping them along the way are the pancreas, gall bladder and liver. The digestive process begins in the mouth. Even before eating begins, the anticipation of eating stimulates glands in the mouth to produce saliva. Digestion works by moving food through the GI tract (gastrointestinal tract). Digestion begins in the mouth with chewing and ends in the small intestine. As food passes through the GI tract, it mixes with digestive juices, causing large molecules of food to break down into smaller molecules. After you eat, it takes about six to eight hours for food to pass through your stomach and small intestine. Food then enters your large intestine (colon) for further digestion, absorption of water and, finally, elimination of undigested food. It takes about 36 hours for food to move through the entire colon. a) Where does the process of digestion begin, also name the enzyme involved in the process? b) Mention the main organs of digestion in a proper sequence? c) How much time does the food approximately take to complete its digestion in the stomach and intestine?	3

MARKING SCHEME

NO	QUESTIONS	MARKS
	SECTION A	
1	(a) 30 cm in front of mirror	1
2	(d) Brown fumes of nitrogen dioxide is evolved.	1
3	(b) II, III	1
4	c. Assertion is true but Reason is false	1
5	a) Both A and R are true, and R is correct explanation of the assertion.	1
6	b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.	1
	SECTION B	
7	(i) Blue colour changes to green (ii) Reddish brown coloured deposit on iron nails $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$	½ + ½ 1
8	Any two characteristics of lungs that make it an efficient respiratory surface Or Any two relevant points to maximise the exchange of gases	1 mark for each point (1+1 = 2marks)
	SECTION C	
9	By passing hydrogen gas over copper oxide $2Cu + O_2 \rightarrow 2CuO$ (Oxidation) $CuO + H_2 \xrightarrow{Heat} Cu + H_2O$ (Redox/ Displacement) OR (a) $2FeSO_4 \rightarrow Fe_2O_3 + SO_2 + SO_3$ (b) Pale green colour changes to brown, Burning smell of sulphur (c) Thermal decomposition	1 ½ + ½ ½ + ½ 1 ½ + ½ 1
10	 **(Break down of glucose by various pathways)**	**1 mark for each pathway (1+1+1= 3marks)**
	SECTION D	
11	i. u = - 15 cm, h = +4 cm , f = - 10 cm. 1/u+1/v= 1/f	(1+1+1)

$\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{(-10)} - \frac{1}{(-15)} = -\frac{1}{30} \Rightarrow v = -30$ cm.

Thus, a screen be placed infront of mirror at a distance of 30 cm from it.

$\because$ magnification $m = \frac{h.}{h} = -\frac{v}{u}$

$\therefore \quad h. = -\frac{v}{u} \times h = -\frac{(-30)}{(-15)} \times 4 = -8$ cm

Thus, image is an inverted image of height 8 cm.

ii)

The radius of the sphere of which the reflecting surface of spherical mirror forms a part is called the radius of curvature of the mirror (1+1)

.f=R/2, R=24cm, f=24/2=12cm ,Thus a convex mirror

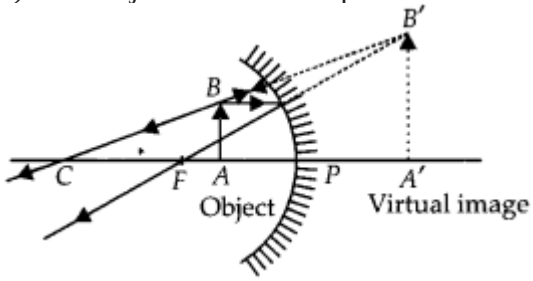
OR

i) Concave mirrors are used in the designing of solar furnaces. When a solar furnace is placed at the focus of a large concave mirror, it focuses a parallel beam of light on the furnace. Therefore, a high temperature is attained at the point after some time.

ii) Positive value of the magnification indicates that image is virtual and erect. (1+1)

(i) Since the image is magnified, the mirror is concave.

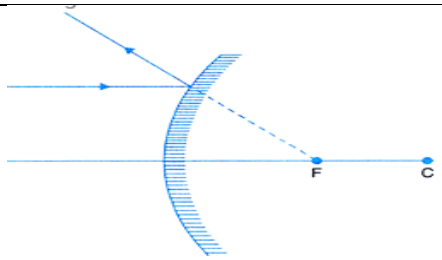
(ii) The object is between pole and focus of the mirror as shown (1+1+1)



SECTION E

12 (a) The incident rays coming parallel to the principal axis after reflection appear to diverge from a common point on the principal axis, this point is called the principal focus of a convex mirror. 1

(b) 1(1/2+1/2)

	 (c) Virtual , erect ,diminished , behind the mirror(2 points)	1(1/2+1/2)
13	(a) The condition produced by the aerial oxidation of oil and fat containing food items marked by unpleasant smell and taste. (b) Any two methods (c) The brown coloured substance formed on iron articles when it is exposed to atmospheric air is known as rust and the process is known as rusting.	1 ½ + ½ 1
14	(a) Mouth, Maltose (b) mouth, oesophagus, stomach, small intestine, large intestine, rectum and anus. (c) About six to eight hours	½ + ½ 1 1