Kendriya Vidyalaya Sangathan Bhopal Region
PRE- BOARD -1 2025-2026
CLASS X SUBJECT- SCIENCE (086)
SET - 01

Time allowed: 3 hours **Maximum marks:80**

General Instructions:

(i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

(ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions

SECTION –A

1.Opening and closing of stomata is due to- 1
(a) high pressure of gases inside the cells.
(b) movement of water in and out of the guard cells
(c) Stimulus of light in the guard cells
(d) diffusion of carbon dioxide in and out of the guard cells

2. Select the group in which all organisms have the same mode of nutrition. 1
(a) Cuscuta, yeast, legumes, leeches and tapeworm
(b) Cactus, ticks, lice, leeches and cow
(c) Cuscuta, ticks, lice, leeches and tapeworm
(d) Cactus, grass, lice, lion and tapeworm

3. If sensory neurons are absent, how will the reflex arc be affected? 1
(a) Reflex actions would be enhanced
(b) Reflex actions would be normal but slower
(c) Reflex actions would be absent or significantly impaired
(d) Reflex actions would be more complex

(4) Which of the following hormone is associated with puberty in females? 1
(a) Insulin (b) Growth hormone (c) Adrenaline (d) oestrogen

5. In an experiment to study interdependent inheritance of two separate traits : shape and colour of the seeds, the ratio of the different combination in F2 progeny would be- 1
(A) 1:3
(B) 1:2:1
(C) 9:3:3:1
(D) 9:1:3:1

6. Biomagnification refers to the increase in the : 1
(a) body weight of an organism.
(b) growth of phytoplanktons.
(c) the amount of harmful chemicals in the successive trophic levels of a food chain.
(d) number of plants and animals in an area.

7. In the given food chain if the amount of energy at the fourth trophic level is 4 kJ, what will be the energy available at the producer level? 1
Grass → Grasshopper → Frog → Snake
(a) 4 kJ (b) 40 kJ (c) 400 kJ (d) 4000 kJ

The following questions are consists of two statements- Assertion (A) and (R). answer these questions by selecting the appropriate options given below:

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8. **Assertion (A)** : In reptiles, the temperature at which the fertilized eggs are kept decides the sex of the offspring. 1
Reason (R) : Sex is not genetically determined in some animals.

9.**Assertion (A)** : Polythene bags and plastic containers are non-biodegradable substances.1
Reason (R) : They can be broken down by microorganisms in natural simple harmless substances

10. "Plants use variety of techniques to get rid of waste materials." Justify this statement giving any four ways. 2

11. Students to attempt either option (a) or (b).

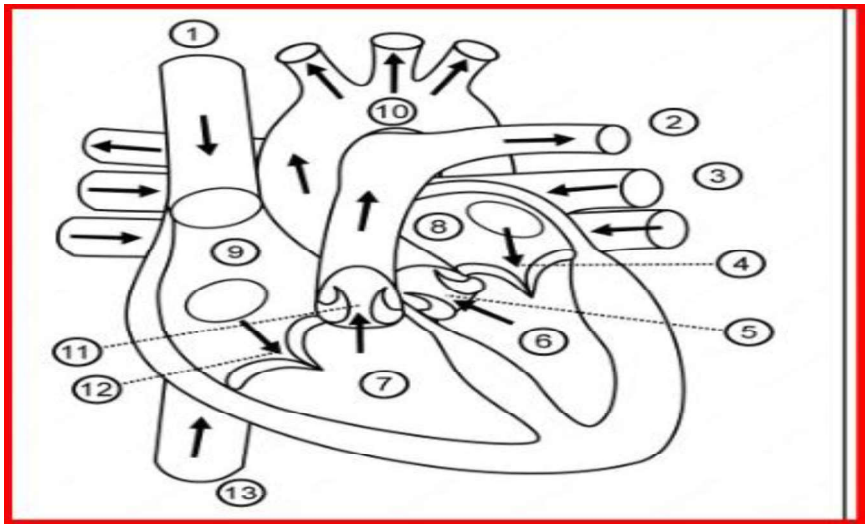
(a) State the role of the following in human digestive system :
(i) Bile juices (ii) Hydrochloric acid
Or 2
(b) With the help of a flow chart show the pathway of breakdown of glucose in a cell to provide energy-
(i) Lack of oxygen in muscles (ii) in the presence of oxygen

12. Why depletion of ozone is a cause of concern? Name the synthetic chemical which is responsible for the drop of amount of ozone in atmosphere. 2

13. (i) In which region of the brain is cerebrum and medulla located. State one function of each. 3
(ii) Where are auxins synthesized in the plant? Which organ of the plant shows negative geotropism?

14. "The sex of a new born child is a matter of chance and none of the parents may be considered responsible for it." Justify the statement with the help of a flow chart showing sex determination in human beings. 3

15. Our Pump- The heart is a muscular organ which is as big as our fist. As both oxygen and carbon dioxide has to be transported to different parts of the body, the heart has different chambers to prevent intermixing of blood rich with the blood carrying carbon dioxide. Observe the diagram carefully and answer the questions given below:- 4



Attempt either subpart (a) or (b).

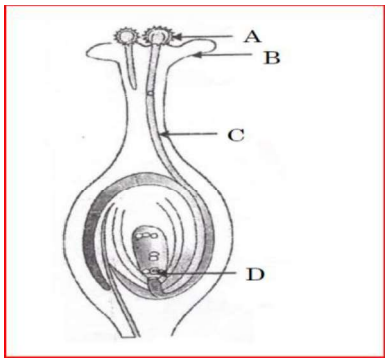
(a)Which chamber of the heart (6,7,8,9) pumps blood to lungs for oxygenation, name it. Identify and name the blood vessels that carry blood to the lungs.
Or
(b)State the significance of separation of right and left side of the heart as seen in the above figure.
(c) Why do chambers 6 and 7 have thicker walls than chambers 8 and 9?
(d) Identify the structure present between 7 and 9 which is numbered as 12. State its function.

16. **Attempt either option (a) or (b).**

(a) (i) Name the parts in the human female reproductive system where the following functions take place :
(1) Maturation of eggs
(2) Fusion of the egg and the sperm
(3) Implantation of the zygote
(ii) What happens to the egg :
(1) when it is fertilised ?
(2) when it is not fertilised ?

Or 5

(b) (i) Explain by giving one example each :(1) Unisexual flowers (2) Bisexual flowers
(ii) Name the labelled parts A, B, C and D in the diagram given below.



(iii) "Pollination may occur without fertilization but fertilization will not take place without pollination". Give reason to justify this statement

SECTION-B

17. In the following case(s) the combination reaction occurs in : 1

I. $CuO + H_2 \rightarrow$

II. $ZnO + C \rightarrow$

III. $Na + O_2 \rightarrow$

IV. $CH_4 + O_2 \rightarrow$

(a) Only III

(b) Only IV

(c) II and III

(d) I, III and IV

18. MnO2 + 4HCl ----> MnCl2 +H2O + Cl2 1

Name the reducing agent in the chemical reaction.

(a) MnO2 (b) HCl (c) MnCl2 (d) H2O

19. Classify the type of reaction in which exchange of ions between reactants takes place. 1

(a) displacement reaction

(b) double displacement reaction

(c) Combination reaction

(d) decomposition reaction

20. How many molecules of water of crystallization are present in a formula unit of Copper Sulphate?

(a) 5 (b)10 (c) 2 (d) 0.5 1

21. Which of the following substance is used for supporting fractured bones? 1

(a) Calcium sulphate dehydrate (b) Sodium sulphate

(c)Calcium sulphate hemihydrate (d) Calcium oxychloride

22. Four statements about the reactions of oxides with dilute hydrochloric acid and aqueous sodium hydroxide are listed.`` 1

I. Aluminium oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide.

II. Calcium oxide reacts with dilute hydrochloric acid and aqueous sodium hydroxide.

III. Zinc oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide.

IV. Sulphur dioxide does not react with either dilute hydrochloric acid or aqueous sodium hydroxide.

Which statements are correct?

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

23. A metal 'X' used in thermit process. When 'X' is heated with oxygen, it gives 'Y', which is amphoteric in nature. 'X' and 'Y' respectively are: 1

(A) Mn, MnO_2

(B) Al, Al_2O_3

(C) Fe, Fe_2O_3

(D) Mg, MgO

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24**. Assertion (A**): Alkanes give addition reaction 1.
Reason (R): Addition reactions are characteristics property of unsaturated hydrocarbons.

25 Show the formation of $MgCl_2$ by transfer of electrons. 2

26. **Attempt either option (a) or (b)**
(a) (i) Why are carbonate and sulphide ores are usually converted into oxides during the process of extraction?
(ii) Generally hydrogen gas is not evolved when a metal reacts with nitric acid. Give reason.
(iii)Name two metal which have low melting point.
Or 3
(b) The old iron bridge constructed several decades ago, is now exhibits significant sign of deterioration and covered with reddish brown flaky substance at several places.
(i) Why does iron bridge appear reddish brown though iron is silvery grey in colour? Name the process involved in this change of colour.
(ii) Suggest any two common ways to prevent or slow down the formation of reddish brown substance on Iron Bridge.

27. Zn +H2SO4 --->ZnSO4 + H2
(i) How can you detect that the liberated gas is a hydrogen gas? 3
(ii) Why has Zn replaced hydrogen from H2SO4?
(iii) Which kind of reaction is taking place in the above equation?

28. A scale for measuring hydrogen ion concentration in a solution, called pH scale has been developed. The p in pH stands for 'potenz' in German, meaning power. On the pH scale we can measure pH generally from 0 (very acidic) to 14 (very alkaline). pH should be thought of simply as a number which indicates the acidic or basic nature of a solution. Higher the hydronium ion concentration, lower is the pH value. 4

(a) What does the scale represent when pH value increases from 7 to 14?
Attempt either subpart (b) or (c)
(b)What happens when the pH of mouth is lower than 5.5?
OR
(c)What happens to the hydrogen ion concentration on diluting an acid?
(d) Two solutions X&Y. The pH of X is 4 and the pH of Y is 7. What is the nature of two solution?

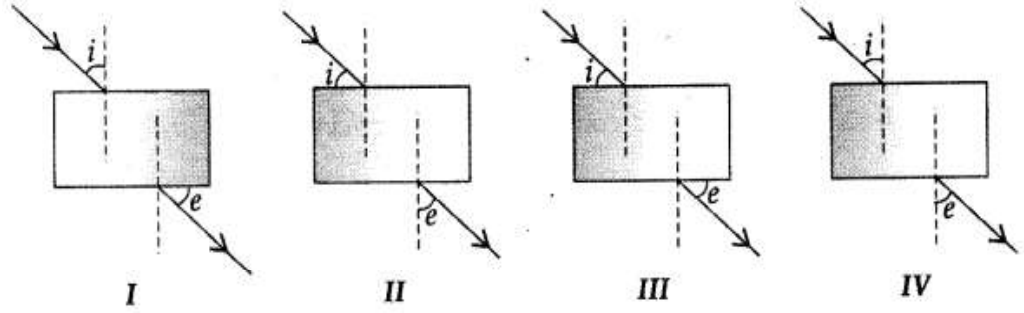
29. **Attempt either option (a) or (b)**
a) A neutral organic compound X (molecular formula C_2H_6O) on reacting with acidified $K_2Cr_2O_7$ gives an organic compound Y, which is acidic in nature. X reacts with Y on warming in the presence of conc, H_2SO_4 to give a sweet smelling compound Z.
(i) Identify X, Y, Z. Name the reaction which occurs when Z is formed.
(ii) Write the chemical equation for the reactions in the conversions of

(1) X to Y and (2) Y to Z
(iii) State the role of (1) acidified $K_2Cr_2O_7$ in the conversion of X to Y. and (2) conc, H_2SO_4 in the conversion of Y to Z.
OR 5

(b)(i)What is a difference between soaps and detergents?
(ii) Why are soaps not very effective when a fabric is washed in hard water? How is this problem resolved?
(iii)Name the substances responsible for hardness of water.

SECTION-C

30. A student does the experiment on tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. He can get a correct measure of the angle of incidence and the angle of emergence by following the labelling indicated in figure: 1



1

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

31. What is the term for the ability of the eye to adjust to changes in light intensity? 1
(a) Accommodation
(b) Refraction
(c) Adaptation
(d) Reflection

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32**. Assertion (A):** The human eye forms a real image on the retina. 1
Reason (R): The crystalline lens of the eye acts as a converging lens

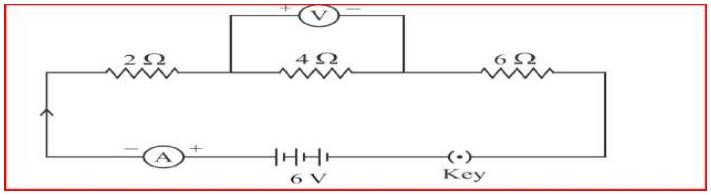
33. Draw a labeled ray diagram to show the formation of image due to a concave mirror when an object is placed between its pole and principal focus. 2

34.Attempt either option(a) or (b)
(a)Name and state the law which explain the heating effect of electric current.
Or 2
(b) What will happen if an electric oven of rating 3 kW; 220 V is operated in a domestic electric circuit (220 V) that has a current rating of 10 A ? Give reason to justify your answer.

35. On one of the Sunday morning, Neeraj was reading a newspaper. He was facing difficulty in reading a text of one of the advertisement. His sister suggested him to get his eyes checked at eye care camp. 3

(A) Name the possible defect he was suffering from.
(B)Write two causes of this defect.
(C)Draw the ray diagram for the correction of this defect.

36. (a)In the given circuit when key is closed, determine the following : 3



(i) Total resistance offered by the three resistors
(ii) Reading of the ammeter
(B) List any two factors which affects the resistance of a conductor

37. (a) What is a solenoid?. Draw the pattern of magnetic field lines of a current carrying solenoid. 3

(b). State two factors on which the strength of magnetic field produced by a current carrying solenoid depends.

38. In our laboratories we use compound microscopes to see the magnified image of a microscopic object. A compound microscope is made up of two lenses. The lens nearest to the object to be viewed, called objective lens, forms real, inverted and magnified image of the object. This image serves as an object for the second lens called eyepiece. The eyepiece forms virtual, erect and magnified image of its object. Thus, the resultant image formed by a microscope is virtual, inverted and magnified with respect to the microscopic object viewed. 4

(a) The image of an object formed by a convex lens of focal length 2 cm is real, inverted and magnified. What is the range of object distance in this case ?

(b) The image of an object formed by a convex lens of focal length 6 cm is virtual, erect and magnified. What is the range of object distance in this case ?

Attempt either subpart (c) or (d)

(c) An object is placed at a distance of 12 cm from the optical centre of a convex lens of focal length 18 cm. Draw a labelled ray diagram to show the formation of image in this case.

OR

(d) The image formed by a convex lens is real, inverted and of the same size as the object. If the distance between the objects and the image is 60 cm, determine the focal length of the lens. Give justification for your answer.

39. **Attempt either option (a) or (b)** 5

(a) Explain the following.
i)Why is tungsten used almost exclusively for the filament of electric lamps?

(ii)Why are the conductors of electrical heating devices, like bread-toasters and electric irons, mostly made of an alloy rather than a pure metal?
(iii)Why is the series arrangement not used in domestic circuits?
(iv)How does the resistance of a wire vary with its area of cross-section?
(v)Why are copper and aluminium wires usually employed for electricity transmission?

Or

(b) (i) How many 176 Ω resistors in parallel are required to carry 5 A on a 220 V line?
(ii) What are the benefits of connecting electrical devices in parallel with the battery instead of connecting them in series?