Sample Paper 13

Class X 2026-27

Science (086)

Time: 3 Hours **Max. Marks: 80**

General Instructions:

1. This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.
2. 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. When a person's kidneys fail, their blood can be cleaned artificially by a machine. This process of filtering waste products like urea from the blood is called:
(a) Transfusion
(b) Dialysis
(c) Osmosis
(d) Filtration

2. While riding a bicycle, the voluntary action of deciding when to turn is controlled by the cerebrum. However, the crucial function of maintaining balance and posture is coordinated by the:
(a) Medulla
(b) Pons
(c) Cerebellum
(d) Hypothalamus

3. Hydra, a freshwater organism, reproduces asexually by developing a small outgrowth on its body which then matures and detaches. What is this mode of reproduction called?
(a) Fragmentation
(b) Regeneration
(c) Budding
(d) Spore Formation

4. In his monohybrid cross experiments, Gregor Mendel self-pollinated the F1 generation plants (which were all heterozygous, Tt). What was the resulting genotypic ratio of the F2 generation?
(a) 3 (Tall) : 1 (Dwarf)
(b) 1 (TT) : 1 (tt)
(c) 1 (TT) : 2 (Tt) : 1 (tt)
(d) 9 : 3 : 3 : 1

5. Consider a simple food chain: Grass → Deer → Tiger. What would be the immediate consequence if the entire tiger population were to be removed from the ecosystem?
(a) The population of grass would decrease.
(b) The population of deer would increase drastically.
(c) The population of deer would decrease due to starvation.
(d) The ecosystem would remain stable and unchanged.

6. Consider the following statements regarding human reproduction:
(i) Fertilization is the fusion of a sperm and an ovum.
(ii) In humans, fertilization normally takes place in the oviduct (fallopian tube).
(iii) The cell formed immediately after fertilization is called an embryo.
(iv) The embryo gets embedded in the wall of the uterus for further development.
Which of the above statements are correct?
(a) (i), (ii), and (iv)
(b) (ii) and (iii) only
(c) (i) and (iv) only
(d) All are correct.

7. In the human double circulatory system, most arteries carry oxygenated blood. Which artery is the major exception, carrying deoxygenated blood?
(a) Aorta
(b) Coronary Artery
(c) Hepatic Artery
(d) Pulmonary Artery

8. **Assertion (A) :** Ozone present in the higher levels of the atmosphere is essential for ecosystems on Earth.
Reason (R) : Ozone gas is a deadly poison.
(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, and R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion(A) :** The shoot of a plant grows upwards, against the pull of gravity.
Reason (R) : This growth pattern is an example of negative geotropism.
(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, and R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

10. Desert plants like cacti keep their stomata closed during the day to conserve water. How do they manage to perform photosynthesis under these conditions?

11. A. What would be the consequence of a deficiency of haemoglobin in our bodies?

OR

B. Differentiate between breathing and cellular respiration.

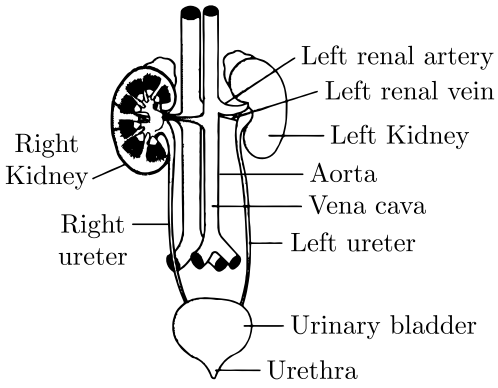
12. What is a 'food web'? Why is it a more accurate representation of an ecosystem than a food chain?

13. Name the hormone that performs the following functions in the human body:
(i) Regulates the metabolism of carbohydrates, fats, and proteins.
(ii) Prepares the body for 'fight or flight' responses.
(iii) Controls the amount of sugar in the blood.

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14. What are fossils? How do they serve as evidence for evolution?

15. Refer to the diagram of the human excretory system and the following questions.



A. Identify the main organ of excretion in the diagram. What is its basic filtration unit called?

OR

B. What is the composition of normal human urine?

C. Trace the path of urine from where it is formed to the point where it is expelled from the body.

16. A. (i) How does budding in Hydra differ from budding in yeast?
(ii) Name two plants that can be propagated by vegetative means.
(iii) List two disadvantages of vegetative propagation.

OR

B. (i) What is the role of the placenta in the development of an embryo?
(ii) What happens in the female reproductive system if the egg is not fertilized?
(iii) Name two sexually transmitted diseases and the causative agent (bacterium/virus) for each.

SECTION-B

17. When a few granules of zinc are added to a blue-coloured copper sulphate solution, the solution turns colourless after some time. This is an example of a:
(a) Combination reaction
(b) Double displacement reaction
(c) Decomposition reaction
(d) Displacement reaction

18. An aqueous solution of ammonium chloride (NH_4Cl) will be:
(a) Acidic
(b) Basic
(c) Neutral
(d) Amphoteric

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19. Which of the following metals is extracted from its ore by the electrolytic reduction of its molten chloride?

(a) Iron

(b) Copper

(c) Sodium

(d) Silver

20. A turmeric stain on a white shirt turns reddish-brown when washed with soap. This is because:

(a) Soap solution is acidic.

(b) Soap solution is basic.

(c) Soap is a neutral salt.

(d) Turmeric is a synthetic indicator.

21. Which of the following substances, when dissolved in water, will not produce hydrogen ions (H^+)?

(a) Hydrochloric acid

(b) Sulphuric acid

(c) Glucose ($C_6H_{12}O_6$)

(d) Acetic acid

22. Over time, silver articles turn black and copper vessels turn green when exposed to air. These are examples of:

(a) Reduction

(b) Melting

(c) Corrosion

(d) Sublimation

23. For the reaction of steam on iron, the balanced chemical equation is

$xFe(s) + yH_2O(g) \rightarrow Fe_3O_4(s) + zH_2(g)$

The values of x, y, and z are:

(a) x=2, y=3, z=3

(b) x=3, y=4, z=4

(c) x=3, y=4, z=2

(d) x=1, y=2, z=2

24. **Assertion (A) :** Ethene is an unsaturated hydrocarbon.
Reason (R) : Ethene molecules contain a double bond between two carbon atoms.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, and R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

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25. State any two characteristic physical properties of ionic compounds.

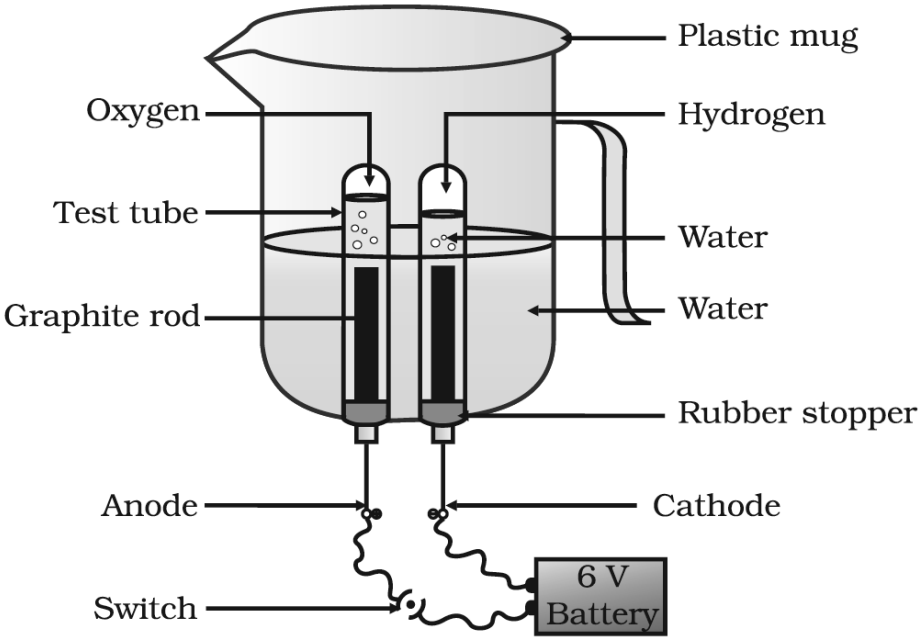
26. Attempt either option A or B.

(a) (i) What is the thermite reaction?
(ii) Write a balanced chemical equation for the reaction.
(iii) State one important application of this reaction.

OR

(b) Explain the process of extracting a moderately reactive metal like zinc from its sulphide ore (zinc blende). Write balanced chemical equations for the reactions involved.

27. The diagram below shows the setup for the electrolysis of water.



(a) Why is the volume of gas collected in the test tube over the cathode double the volume of gas collected over the anode?
(b) Name the gas collected at the cathode and the gas collected at the anode.
(c) What would be observed when a burning candle is brought near the mouth of each test tube?

28. A person suffering from indigestion due to overeating is often advised to take an antacid.

(a) Why does indigestion sometimes cause pain and irritation in the stomach?
(b) What is the primary function of an antacid? Give an example of a common antacid.
(c) Write a balanced chemical equation for the reaction that occurs when magnesium hydroxide (an antacid) neutralizes the excess acid in the stomach.

OR

(d) A farmer discovers that the soil in his fields is too acidic (low pH), which is affecting crop growth. What type of substance would you recommend he add to the soil? Name two common substances used for this purpose.

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29. Attempt either option A or B.

(A) An organic compound 'X' has the molecular formula C_2H_6O. It is a good solvent and is the active ingredient in all alcoholic drinks.

(a) Identify 'X' and draw its structure.

(b) What happens when 'X' is heated with excess concentrated sulphuric acid at 443 K? Name the reaction and write the balanced chemical equation.

(c) What is observed when a small piece of sodium is dropped into 'X'? Write the balanced chemical equation for the reaction.

OR

(b) (a) What is a homologous series? List any two of its characteristics.

(b) Write the name and chemical formula of the second member of the alkyne homologous series.

(c) Draw the structures of the two possible isomers of butane (C_4H_{10}).

SECTION-C

30. A student is using a magnifying glass to view a small object and observes the following:

I. The magnifying glass is a convex lens.

II. The image formed is virtual, erect, and magnified.

III. The object is placed at a distance greater than the focal length of the lens.

Choose from the following the correct option that lists the correct statements.

(a) I and II (b) I and III

(c) I, II and III (d) II and III

31. A person cannot see objects beyond 2 meters. Which of the following lenses should be used to correct this vision defect?

(a) A concave lens with a focal length of 2m

(b) A convex lens with a focal length of 2m

(c) A concave lens with a focal length of 1m

(d) A convex lens with a focal length of 1m

32. **Assertion (A) :** The image formed by a convex mirror is always virtual.

Reason (R) : A convex mirror is a diverging mirror, so the light rays never actually meet after reflection.

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, and R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

33. The magnification produced by a plane mirror is always +1.

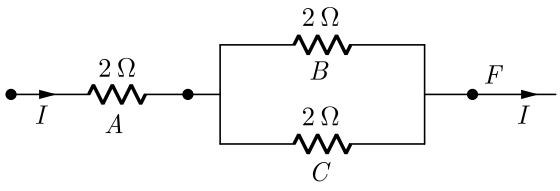
A. What does the positive sign indicate?

B. Why is the size of the image equal to the object?

C. Can a plane mirror form a real image?

34. Attempt either option A or B

A. Three $2\,\Omega$ resistors A, B and C are connected as shown in figure. Each of them dissipates energy and can withstand a maximum power of 18 W without melting. Find the maximum current that can flow through the three resistors.

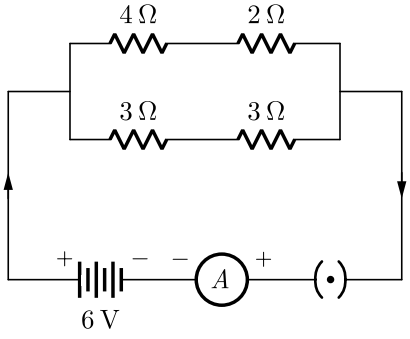


OR

B. A wire is cut into three equal parts and then connected in parallel. How will its :
(a) resistance
(b) resistivity get effected ?

35. Write about power of accommodation of human eye. Explain why the image distance in the eye does not change when we change the distance of an object from the eye ?

36. n the given circuit, find :



(a) Total resistance of the network of resistors
(b) Current through ammeter A

37. A student passes a ray of light from air into glass.
He claims that the ray bends towards the normal.
(i) Is the claim correct?
(ii) Explain why this happens.

38. Convex mirror is used as a rear view mirror in vehicles. Since the image of the object formed is small in size, the field of view is increased. Convex mirror is also used in street lights to diverge light over a large area.



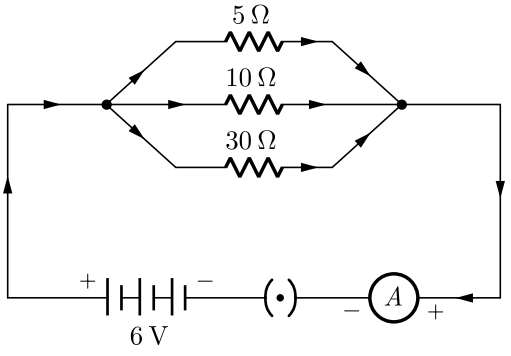
(i) In driver's mirror, what type of image is formed behind the vehicle ?
(ii) What can you say about field of view of a convex mirror ?
(iii) A convex mirror is used to form the image of an object. What is the nature of formed image ?

39. Attempt either option A or B.

A. (i) With the help of a suitable circuit diagram prove that the reciprocal of the equivalent resistance of a group of resistances joined in parallel is equal to the sum of the reciprocals of the individual resistances.
(ii) In an electric circuit two resistors of 12 Ω each are joined in parallel to a 6 V battery. Find the current drawn from the battery.

OR

B. For the circuit diagram given below, calculate :
(i) the value of current through each resistor.
(ii) the total current in the circuit.
(iii) the total effective resistance of the circuit.



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