PRERNA EDUCATION

IIT/ MEDICAL/ FOUNDATION

SAMPLE PAPER

Class – 10th

Subject – Science

General Instructions:

(i) The question paper comprises two sections A, B, C, D and E. You are to attempt all the sections.

(ii) All questions are compulsory.

(iii) Internal choice is given in sections B, C, D and E.

(iv) Question numbers 1 and 2 in Section-A are 1 mark questions. These are to be answered in one word or in one sentence.

(v) Question numbers 3 to 6 in Section-B are 2 marks questions. These are to be answered in 30 words each.

(vi) Question numbers 7 to 15 in Section-C are 3 marks questions. These are to be answered in about 50 words each.

(vii) Question numbers 16 to 21 in Section-D are 5 marks questions. These are to be answered in about 70 words each.

(viii) Question numbers 22 to 27 in Section-E are based on practical skills. Each question is a two marks question. These are to be answered in brief.

Section - 'A'

1. Name the component of blood which transports: 1 mark

(i) Oxygen

(ii) Food, nitrogenous waste and carbon dioxide.

2. Give the number of elements in 2nd and 5th period in Modern Periodic Table. 1 mark

Section - 'B'

3. Write any two differences between food chain and food web. 2 marks

4. An aldehyde as well as a ketone can be represented by the same molecular formula, say C_3H_6O. Write their structures and name them. State the relation between the two in the language of science. 2 marks

5. What is the cause of diabetes? How it can be controlled? 2 marks

OR

Define neuron. Name the parts of neuron where:

(i) Information is acquired.

(ii) Impulse must be converted into chemical signal for onward transmission.

6. List two properties of the image formed by convex mirrors. Draw ray diagram in support of your answer. 2 marks

Section - 'C'

7. Discuss how the brain perceives the image formed on the retina. 3 marks

OR

What is meant by power of a lens? Write the SI unit. A student uses a lens of focal length 40 cm and another of -20cm. Write the nature and power of each lens.

8. Is it necessary to connect an earth wire to electric appliances having metallic covers. Why? How will you identify earth wire in household circuit? 3 marks

9. State Ohm's Law. Draw a circuit diagram to verify this law indicating the positive and negative terminals of the battery and the meters. Also show the direction of current in the circuit. 3 marks

10. Write three main functions of the nervous system. 3 marks

11. What is organic evolution? It cannot be equated with progress. Explain with the help of a suitable example. 3 marks

OR

What is an ecosystem? List its two main components. We do not clean natural ponds or lakes but an aquarium needs to be cleaned regularly. Why is it so? Explain.

12. How do Mendel's experiment show that traits are inherited independently? 3 marks
13. Name the process by which nuclear energy is generated and also name one substance used for it. Give two advantages and two hazards of nuclear energy. 3 marks

14. (i) Mention the role of the following organs of human male reproductive system:3 marks
(a) Vas Deferens
(b) Testis
(c) Prostate Glands
(d) Scrotum

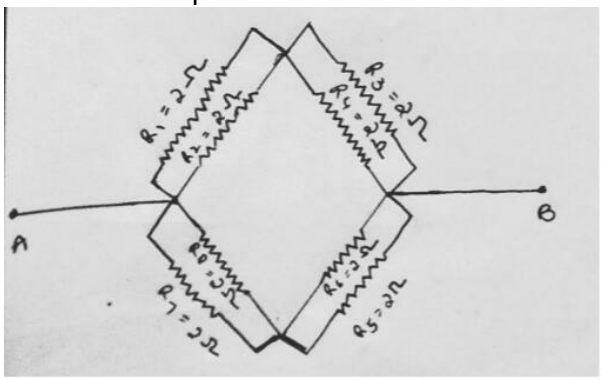
15. An element 'M' has atomic number 12. 3 marks
(i) Write its electronic configuration and valency.
(ii) Is 'M' a metal or a non-metal? Give reason in support of your answer.
(iii) Write the formula and nature (acidic/basic) of the oxide of 'M'.

OR

An element 'X' belongs to third period and second group of the Modern Periodic Table.
(i) Write its electronic configuration.
(ii) Is it a metal or non-metal? Why?
(iii) Write the formula of the compound formed when 'X' reacts with an element.
(a) Y of electronic configuration 2, 6.
(b) Z with electronic configuration 2, 8, 7.

Section - 'D'

16. Find the equivalent resistance across the two ends A and B of this circuit. 5 marks



17. Make the structure of methane by showing sharing of electrons between carbon and hydrogen atoms. How could you convert methane into chloroform by substitution reaction? Explain with the help of chemical reactions. 5 marks

OR

State the reason why carbon can neither form c4+ cations nor c4− anions but forms covalent compound. Also state the reason to explain why covalent compounds:
(i) Are bad conductor of electricity.
(ii) Have low melting and boiling points.

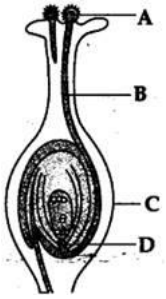
18. Account for the following: 5 marks
(i) State the relation between hydrogen ion concentration of an aqueous solution and its pH.
(ii) An aqueous solution has pH value of 7.0. Is this solution acidic, basic or neutral?
(iii) Which has a higher pH value, 1 M HCl or 1 M NaOH solution?
(iv) Tooth enamel is one of the hardest substances in our body. How does it undergo damage due to eating chocolates and sweets? What should we do to prevent it?
(v) How do [H+] ions exist in water?

19. (i) Write the names and one function of each of any three growth hormones in plants.
(ii) In the absence of muscle cells, how do plant cells show movement? 5 marks

OR

(i) Draw a well-labelled diagram of human brain.
(ii) What is the main thinking part of brain?
(iii) Name two main parts of hind brain and state the function of each.

20. (i) Name the parts labelled as A, B, C and D in the diagram given below: 5 marks



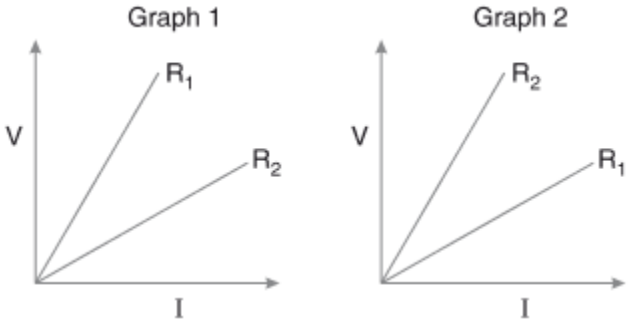
(ii) What is pollination? State its significance.
(iii) How does fertilization occur in flowers? Name the parts of the flower that develop into
(a) seed
(b) fruit after fertilization.

21. What does an electric circuit mean? Name a device that helps to maintain a potential difference across a conductor in a circuit. When do we say that the potential difference across a conductor is 1 volt? Calculate the amount of work done in shifting a charge of 2 coulomb from a point A to B having potentials 110V and 25V respectively. 5 marks

OR

(a) An electric lamp of 24π and a conductor of 6 are connected in parallel to a 12V battery. Calculate:
(i) Total resistance
(ii) Potential difference across the conductor.
(iii) Total current in the circuit.

(b) Two students perform experiments on two given resistors R1 and R2 and plot the following V-I graphs. If R1 > R2 , which of the two diagrams correctly represent the situation on the plotted curves? Justify your answer.



Section - 'E'

22. What is meant by detaching? Why do plants get destarched when kept in continuous darkness for about 48 hours? 2 marks

OR

How do guard cells regulate opening and closing of stomatal pores?

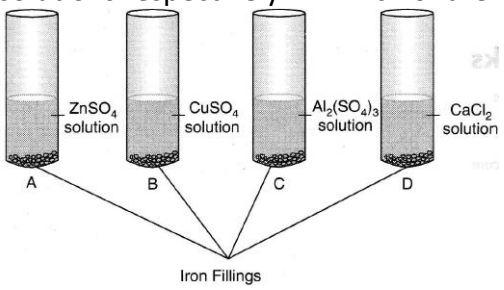
23. Write two precautions to be taken while finding the image distance using a convex lens. 2 marks

24. Differentiate a real image from a virtual image giving two points of difference. 2 marks

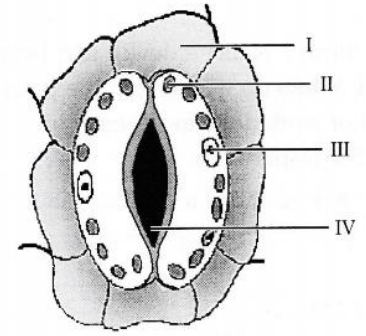
OR

If two resistors of value R are connected in series and then in parallel, what is the difference in equivalent resistance in both cases?

25. Iron fillings are put in different test-tubes A, B, C and D containing ZnSO4, CuSO4,Al2(SO4)3, CaCl2 solutions respectively. In which of the following test- tubes the change will be observed? 2 marks



26. In the given figure label the structures I, II, III and IV marked in the diagram. 2 marks



27. What are two conditions which promotes corrosion? 2 marks

OR

Out of the following list of chemicals, select those which are required to study the prescribed four properties of acetic acid in the laboratory. Litmus solutions (blue or red), water, alcohol, sodium chloride, sodium hydrogen carbonate, calcium hydroxide solution.