

Reason (R): Low voltage is used for the purpose of transmission.

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

20. **Assertion (A):** Man is an omnivore. [1]

Reason (R): Man eats food products obtained from both plants and animals.

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

Section B

21. What happens when nitric acid is added to an egg shell? [2]

22. Why is DNA copying essential part of the process of reproduction? [2]

23. A student was asked to prepare a temporary mount of a leaf peel. Write the procedural steps in the correct sequence. [2]

OR

What are the waste materials eliminated by our body? How are they generated?

24. For which position of the object does a convex lens form a virtual and erect image? [2]

25. (a) Define the term current rating of an electric fuse? [2]

(b) Name the material used to make electric fuse?

(c) Name two safety measure commonly used in electric circuit and appliances?

OR

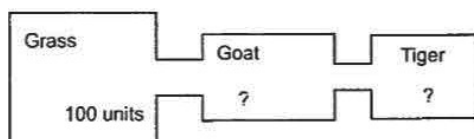
You have two circuits:

(i) a 6V battery is series with 1Ω and 2Ω resistors

(ii) a 4V battery in parallel with 12Ω and 2Ω . resistors

Compare the power used in 2Ω resistor in each case.

26. Given below is an energy flow diagram. Study it carefully and answer the following questions: [2]



a. How much energy (in units) will pass from grass to goat?

b. How much energy (in units) will pass from goat to tiger?

c. Which law operates during the transfer of energy from grass to goat to tiger?

Section C

27. Hydrogen is not a metal but it has been assigned a place in the reactivity series of metals. Explain. [3]

28. i. Write the electron-dot structures for sodium, oxygen and magnesium. [3]

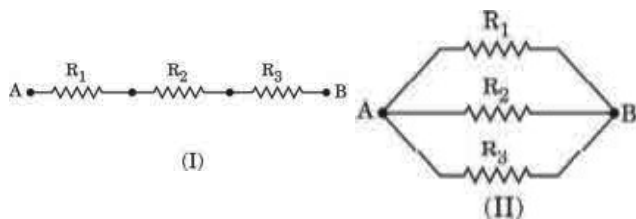
ii. Show the formation of Na_2O and MgO by the transfer of electrons.

iii. What are the ions present in these compounds?

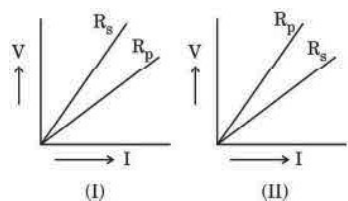
OR

i. By the transfer of electrons, illustrate the formation of bond in magnesium chloride and identify the ions present in this compound.

- ii. Ionic compounds are solids. Give reasons.
- iii. With the help of a labelled diagram show the experimental set up of action of steam on a metal.
29. Draw labeled diagram of human respiratory system and name the parts. [3]
30. In human beings, the statistical probability of getting either a male or female child is 50:50. Give a suitable explanation for this. [3]
31. i. Name the spherical mirror used as: [3]
- shaving mirror
 - Rear view mirror in vehicles
 - Reflection in search-light.
- ii. Write any three difference between a real and a virtual image.
32. i. Write the formula for determining the equivalent resistance between A and B of the two combinations (I) and (II) of three resistors R_1 , R_2 and R_3 arranged as follows: [3]



- ii. If the equivalent resistance of the arrangements (I) and (II) are R_s and R_p respectively, then which one of the following VI graphs is correctly labelled? Justify your answer.



33. i. It would cost a man ₹3.50 to buy 1.0 kW h of electrical energy from the Main Electricity Board. His generator has a maximum power of 2.0 kW. The generator produces energy at this maximum power for 3 hours. Calculate how much it would cost to buy the same amount of energy from the Main Electricity Board. [3]
- ii. A student boils water in an electric kettle for 20 minutes. Using the same mains supply he wants to reduce the boiling time of water. To do so should he increase or decrease the length of the heating element? Justify your answer.

Section D

34. i. Distinguish between esterification and saponification reactions with the help of chemical equation for each. [5]
- ii. Write an activity to show the formation of an ester in a school laboratory.

OR

What is methane? Draw its electron dot structure. Name the type of bonds formed in this compound. Why such compounds

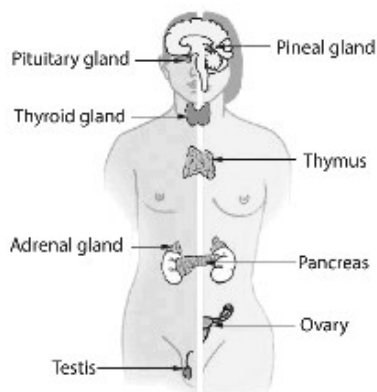
- Are poor conductors of electricity and
- Have low melting and boiling points.

What happens when this compound burns with oxygen?

35. Draw a well labeled diagram of male reproductive system and describe its parts. [5]

OR

Given below is a diagram of the human endocrine system.



Using the given diagram, answer the following questions:

- i. How pituitary gland regulates the growth of the body?
- ii. Which hormone is responsible for the carbohydrate, protein, and fat metabolism in the body?
- iii. Which pair of glands prepare the body to deal with emergency situations?
- iv. Which gland secretes insulin and what does it do in the body?
- v. What is the function of endocrine glands?

36. An object is placed at a distance of 60 cm from a concave lens of focal length 30 cm. [5]

- i. Use the lens formula to find the distance of the image from the lens.
- ii. List four characteristics of the image (nature, position, size, erect/inverted) formed by the lens in this case.
- iii. Draw a ray diagram to justify your answer to the part(ii).

OR

Rishi went to a palmist to show his palm. The palmist used a special lens for this purpose.

- i. State the nature of the lens and the reason for its use.
- ii. Where should the palmist place/hold the lens so as to have a real and magnified image of an object?
- iii. If the focal length of this lens is 10 cm and the lens is held at a distance of 5 cm from the palm, use lens formula to find the position and size of the image.

Section E

37. **Read the text carefully and answer the questions:** [4]

As neutral atom carbon has electronic configuration $\frac{K}{2}, \frac{L}{4}$. To gain inert gas configuration carbon can either donate 4 valence electrons (helium gas configuration) or gain 4 electrons (neon gas configuration), but it cannot do so. To acquire inert gas configuration carbon can only share its 4 valence electrons with other atoms forming covalent bonds. A covalent bond can be defined as a chemical bond formed between two atoms by mutual sharing of valence electrons so that each atom acquires the stable electronic configuration of the nearest noble gas. The concept of covalent bonds was given by Langmuir and Lewis to explain bonding in non-ionic compounds. The covalent bonds are of three types. If each atom contributes one electron, the covalent bond formed is called a single covalent bond and is represented by a single line (-) and if each atom contributes two electrons, the covalent bond formed is called a double bond and is represented by a double line (=) and if each atom contributes three electrons, the covalent bond formed is called a triple bond and is represented by a triple line (\equiv).

- (i) Define Catenation.
- (ii) What are name given for carbon atoms linked with single, double, triple bond?

OR

Define Valency and write two examples of molecules containing double bond.

38. **Read the text carefully and answer the questions:** [4]

Mendel blended his knowledge of Science and mathematics to keep the count of the individuals exhibiting a particular trait in each generation. He observed a number of contrasting visible characters controlled in pea plants in a field. He conducted many experiments to arrive at the law's of inheritance.

- (i) If only one pair of contrasting characters like tall and short plants is taken, plants obtained in F1 generation are not of medium height. Why?
- (ii) Name the recessive traits in above case.
- (iii) Mention the type of the new combinations of plants obtained in F2 progeny along with their ratio, if F1 progeny was allowed to self pollinate.

OR

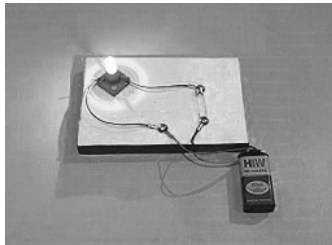
If 1600 plants were obtained in F2 progeny, write the number of plants having traits :

- i. Tall with round seeds
- ii. Short with wrinkled seeds

Write the conclusion of the above experiment.

39. **Read the text carefully and answer the questions:** [4]

How do we express electric current? Electric current is defined by the amount of charge flowing through a particular area in unit time. In other words, it is the rate of flow of electric charges. In circuits using metallic wires, electrons constitute the flow of charges. However, electrons were not known at the time when the phenomenon of electricity was first observed. So, electric current was considered to be the flow of positive charges and the direction of flow of positive charges was taken to be the direction of electric current. Conventionally, in an electric circuit, the direction of electric current is taken as opposite to the direction of the flow of electrons, which are negative charges.



- (i) If a net charge Q , flows across any cross-section of a conductor in time t , then the current I , through the cross-section is given by which formula?
- (ii) What is the SI unit of electric charge? It is equivalent to how many numbers of electrons?
- (iii) The electric current is expressed in which unit? Define the unit used to measure electric current.

OR

If the amount of charge passing through the cell in 4 seconds is 12 C then find the current supplied by a cell.

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