

CLASS: 10

SUBJECT: SCIENCE (086)

SET: 2

Roll No: 10331

TIME: 3 hrs

M.M.: 80

INSTRUCTIONS

1. This question paper consists of 39 questions. All questions are compulsory.
2. The question paper is divided into 5 sections – A, B, C, D and E
3. **Section A** - Question number 1-20 carry one mark each.
4. **Section B** - Question number 21-26 carry two marks each.
5. **Section C** - Question number 27-33 carry three marks each.
6. **Section D** - Question number 34-36 carries five marks each.
7. **Section E** - Question number 37-39 carries four marks each.

SEC A

Q1. In a diamond, each carbon atom is bonded to four other carbon atoms to form

- A. A hexagonal array structure
B. A rigid three-dimensional structure
C. A structure in the shape of a football
D. A structure of a ring

Q2. When a solution is added to crust egg shells a gas is evolved that turns lime water milky the solution contains

- A. ammonium chloride
B. sodium chloride
C. potassium chloride
D. hydrogen chloride

Q3. When iron objects are dipped in molten zinc a thin coating of zinc is formed on the surface of iron this process is called

- A. Anodizing
B. galvanizing
C. Alloying
D. painting

Q4. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?

- A. Lemon Juice B. Vinegar C. Common salt D. An antacid

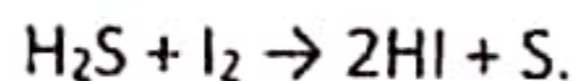
Q5. Gold is soluble in

- A. Hydrochloric acid B. Sodium hydroxide
C. Nitric acid D. Aqua regia

Q6. Alloys of which of the following metal are light and are used for making aeroplanes

- A. Silver B. Aluminium
C. Zinc D. Tin

Q7. The chemical reaction between Hydrogen sulphide and iodine to give Hydrogen iodide and sulphur is given below:



The reducing and oxidising agents involved in this redox reaction are:

- A. Iodine and sulphur, respectively
B. Iodine and hydrogen sulphide, respectively
C. Sulphur and iodine, respectively
D. Hydrogen sulphide and iodine, respectively

Q8. The gap between two adjacent neurons through which nerve impulses transmitted is called:

- A. Dendrite B. Synapse
C. Axon D. cell body

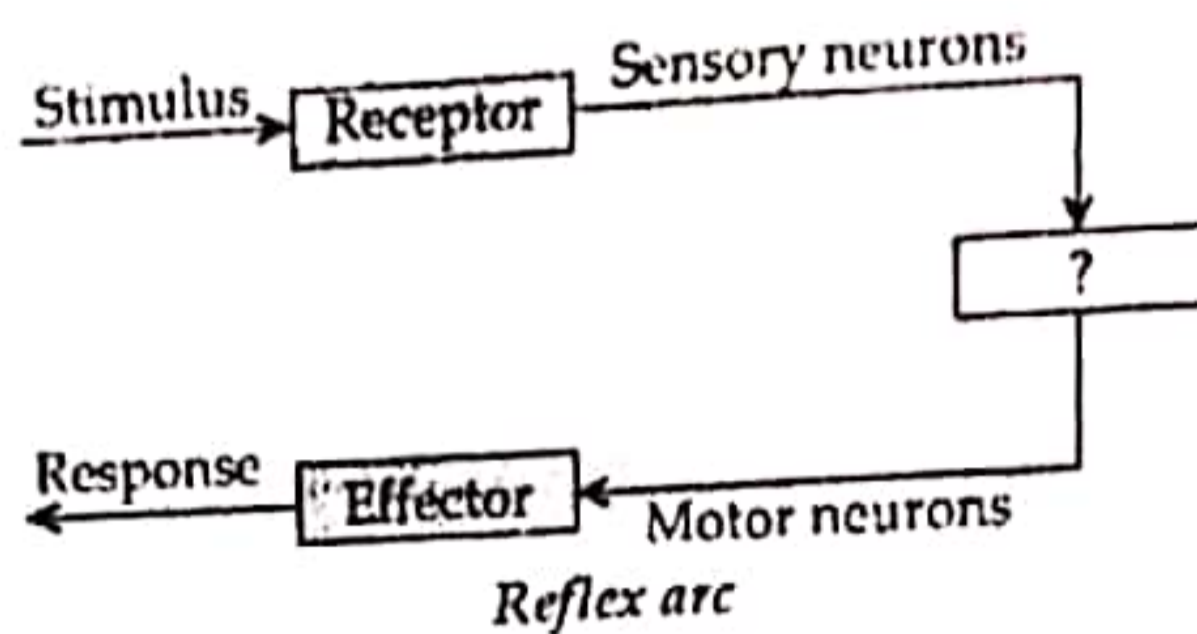
Q9. Opening and closing of stomatal pore depends upon:

- A. Atmospheric temperature.
B. Oxygen concentration around stomata.
C. CO₂ concentration around stomata.
D. Water content in guard cell.

Q10. Which one among the following is not removed as a waste product from the body of a plant?

- A. Excess water B. Resins and gums C. Urea D. Dry leaves

Q11.



Give the missing term.

- A. Spinal cord B. Brain C. Cranial nerves D. Relay nerves

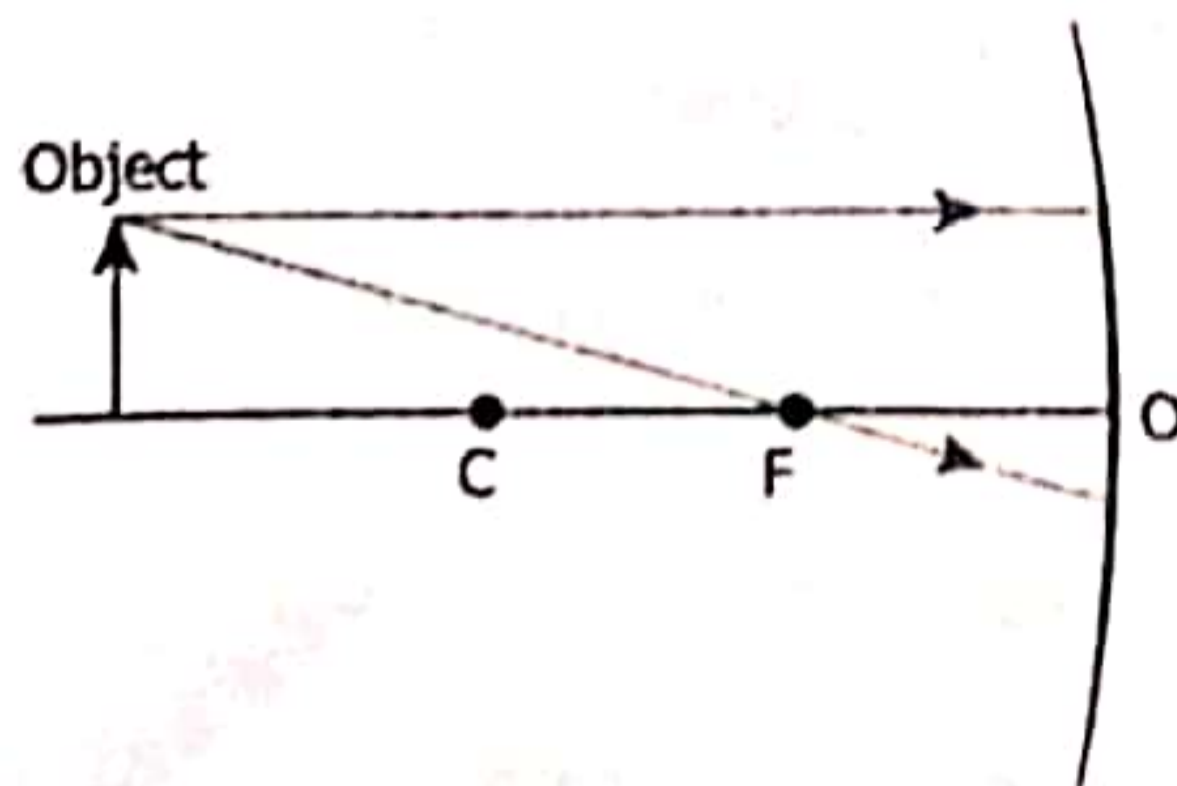
Q12. Akshya potted some germinated seed in a pot. He put the pot in a cardboard box open from one side and kept the box faces sun light. After few days, he observed the shoot bends towards light as shown in the image.



What type of tropism did he observe?

- A. Hydrotropism B. Geotropism
C. chemotropism D. Phototropism

Q 13. The image shows the path of incident rays to a concave mirror.



Where would the reflected rays meet for the image formation to take place?

- A. Behind the mirror
B. Between F and O
C. Between C and F
D. Beyond C

Q14. The magnetic field lies in the middle of the current carrying solenoid are:

A. Circles

B. Spirals

C. Parallel to the axis of the tube

D. Perpendicular to the axis of the tube

Q15. One coulomb charge is equivalent to the charge contain in –

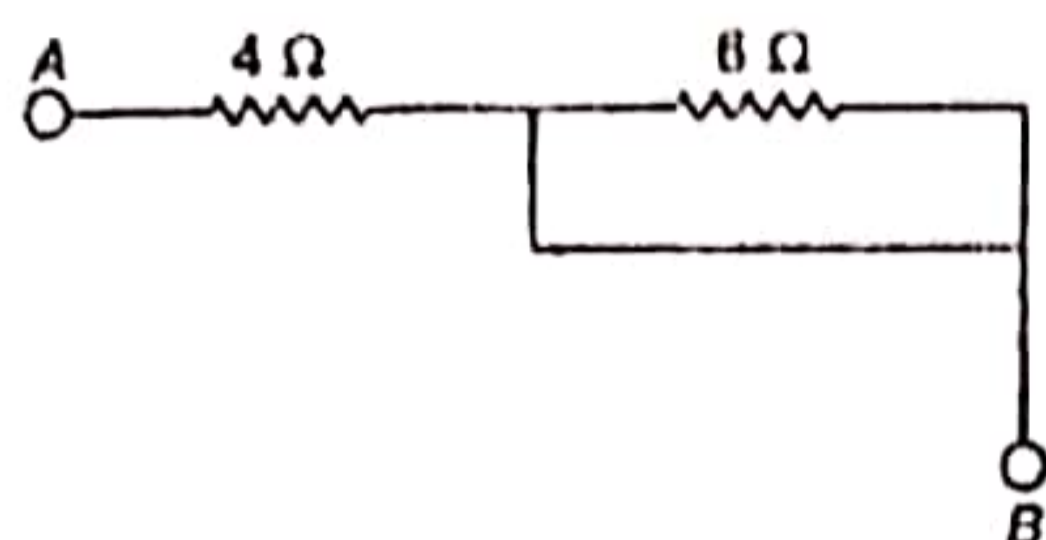
A. 2.6×10^{19} electrons

B. 2.65×10^{18} electrons

C. 6.2×10^{19} electrons

D. 6.25×10^{18} electrons

Q16. The effective resistance between A and B is



A. $4\ \Omega$

B. $6\ \Omega$

C. May be $10\ \Omega$

D. Must be $10\ \Omega$

Directions: For question numbers 17 to 20, two statements are given one is assertion (A) and the other is reason (R). Select the correct answer to these questions from the option A, B, C and D as given below:

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

B. Both (A) and (R) are correct but (R) is not the correct explanation of assertion.

C. (A) is true but (R) is false.

D. (A) is false but (R) is true.

Q17. Assertion (A): Most of the metals are lustrous.

Reason (R): They reflect the light of sun.

Q18. Assertion (A): Decomposers causes natural replenishment of the soil.

Reason (R): Decomposers breakdown complex inorganic substances into simple organic substances that go in to the soil.

Q19. Assertion (A): Selfing of a plant for several generations helps plant breeders to obtain pure breeding varieties.

Reason (R): Pure breeding plants are heterozygous for many traits.

Q20. Assertion (A): Bending a wire does not affect electrical resistance.

Reason (R): Resistance of wire is proportional to resistivity of material

SEC -B

Q21.I. Write the formula and draw electron dot structure for Ethane.

II. Draw the structure of soap molecule and label it's different parts.

Q22. I.What is regeneration? Give one example of an organism that shows regeneration as well as budding.

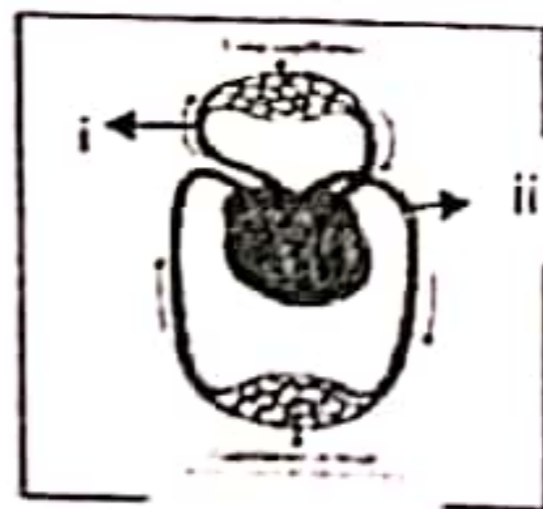
II. Why aren't more complex organism give rise to new individuals through regeneration?

Q23. Rahul was suffering from liver disease and his doctor advised him to avoid oily and fatty food. Give two reasons for advise.

OR

Oxygen is mostly transported by a pigment in our blood whereas carbon dioxide is transported in dissolved form in blood.Give two reasons that make the above statement correct.

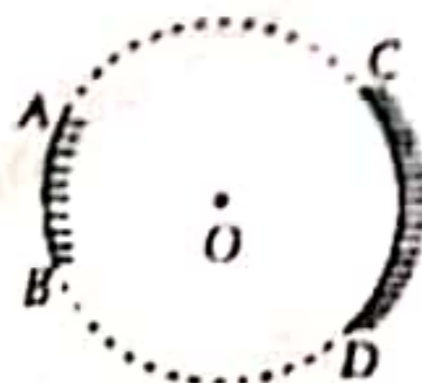
Q24.A schematic diagram of blood circulation in humans is shown in this figure. Identify i and ii with its respective functions.



Q25. AB and CD, two spherical mirrors, from parts of a hollow spherical ball with its centre at O as shown in the diagram.

I.If arc AB = 10cm = 1/2 arc CD, what is the ratio of their focal lengths?

II.State which of the two mirrors will always form virtual image of an object placed in front of it and why?



OR

The linear magnification produced by a spherical mirror is $+1/2$. Analysing this value state the

I. Type of mirror

II. Position of the object with respect to the pole of the mirror. Draw ray diagram to justify your answer

Q26. A wire has a resistance of 16Ω . It is melted and drawn into a wire of half its original length. Calculate the resistance of the new wire. What is the percentage change in its resistance?

SEC - C

Q 27. Give reason for the following

I. Carbon neither forms C^{4+} cation nor C^{4-} anion, but forms covalent bonds.

II. Butter does not decolourise bromine water while cooking oil do.

III. Carbon forms large number of its compounds.

Q28. What happens when

I. Ethanol is burnt in air?

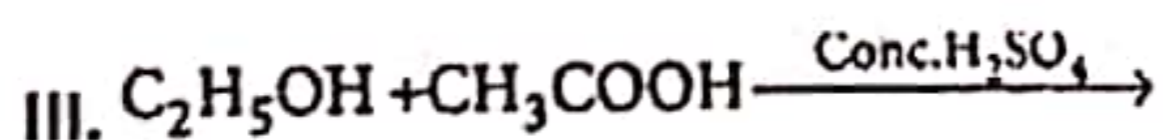
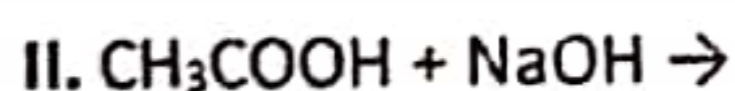
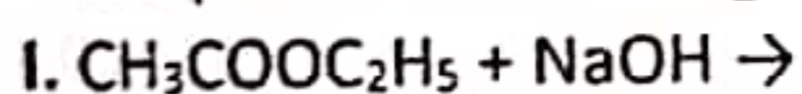
II. Ethanol is heated with excess conc. H_2SO_4 at 443 K

III. A piece of sodium is dropped into ethanol?

(write balanced chemical equation in each case)

OR

Complete the following chemical equations and balance them;



Q29. I. define isomerism.

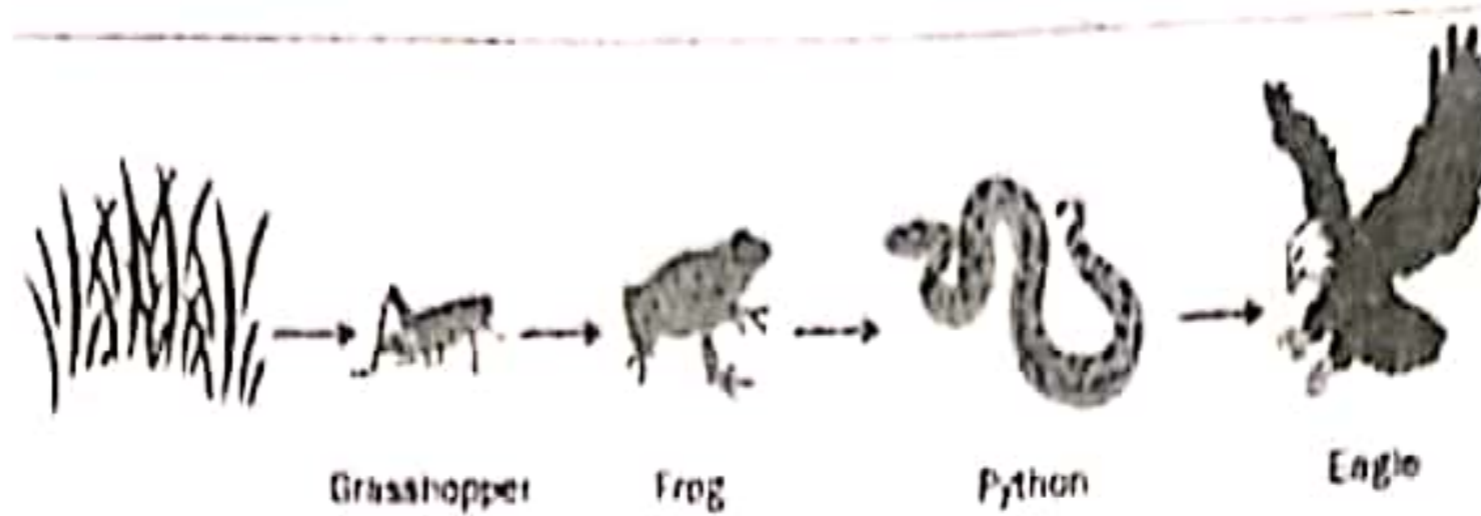
II. Explain why propane can not exhibit isomerism.

III. Draw the structures of three isomers of hexane and write their names.

Q30. Study the food chain given below and answer the following questions .

I. If the amount of energy available at the third trophic level is 100 joules, then how much energy will be available at the producer level? Justify your answer.

II. Is it possible to have two more trophic levels in this food chain just after 5th trophic level(eagle), give suitable reason for your answer.



Q31. A student has focused the image of a candle flame on a white screen using a concave mirror. The situation is given below :

Length of the flame is 3.0 cm

Focal length of the mirror is 24 cm

Distance of flame from the mirror is 36 cm

If the flame is perpendicular to the principal axis of the mirror, then calculate the following

I.Distance of the image from the mirror

II.Length of the image

III.If the distance between the mirror and the flame is reduced to 20 cm, then what would be observed on the screen ?

Q32.I. State Joule's law of heating. Write it's two uses.

II. Write the three equations showing relation between R, V, I and P.

Q33. Draw neat ray diagrams for following situations:

I.Object is placed beyond C of a concave mirror.

II.Object is placed anywhere between infinity and pole in front of a convex mirror.

III.Object is placed between $2F_1$ and F_1 in front of a convex lens.

SEC -D

Q34. A metal M is generally found in the form of carbonate ore in nature.

I.Name the metal M

II.Which process will be suitable for extraction of this metal from its ore

III.Write the balance chemical equations involved in the process of extraction of this metal from it's ore.

IV. With the help of a labelled diagram explain the process of electrolytic refining of metal M.

OR

A metal M which is one of the best conductor of heat and electricity used in making electric wires is found in nature as sulphide ore M_2S

I. Name the metal M

II. Which process will be suitable for extraction of this metal from its ore M_2S .

III. Write the balance chemical equations involved in the process of extraction

IV. With the help of a labelled diagram explain the process of electrolytic refining of metal M.

Q35. A green stemmed rose plant denoted by **GG** is allowed to cross with brown stemmed rose plant denoted by **gg** and its **F₁** progeny were self pollinated to form **F₂** progeny. List your observations regarding :

I. Colour of the rose stem in their **F₁** progeny

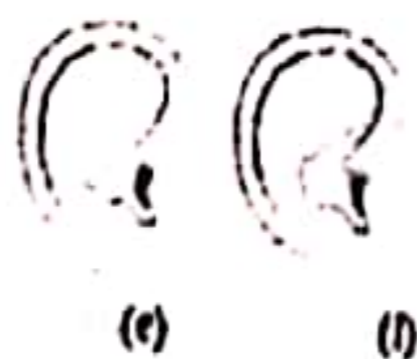
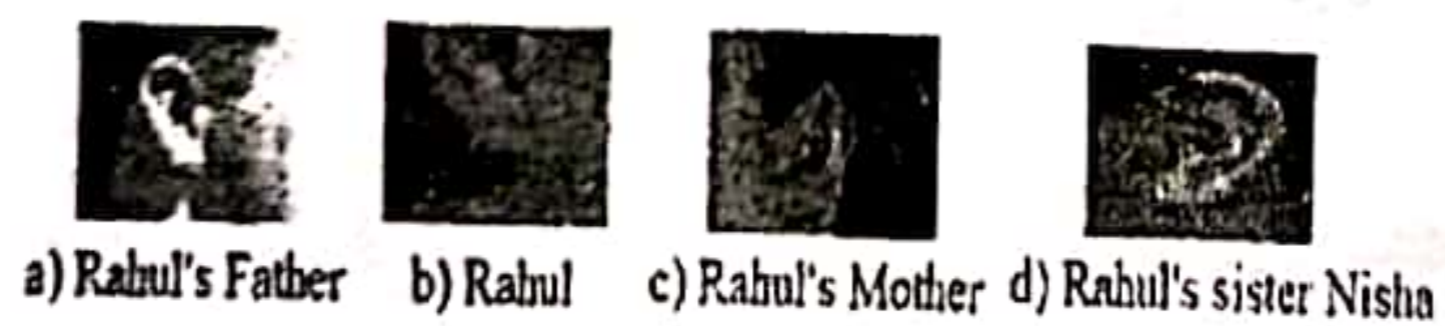
II. Percentage of brown stemmed plants in **F₂** progeny.

III. Ratio of **GG** and **Gg** in the **F₂** progeny.

IV. Based on the findings of this cross, what conclusion can be drawn?

OR

Mendel worked out the main rules of inheritance. The rules for inheritance of traits in human beings are related to the fact that both the father and mother contribute equal amounts of genetic material to the offsprings. This means each trait can be influenced by both paternal and maternal DNA. Figures (a) to (d) given below represent the type of ear lobes present in a family consisting of 2 children – Rahul, Nisha and their parents.



Type of ear lobes

Excited by his observation of different types of ear lobes present in his family, Rahul conducted a survey of the type of ear lobes found {Figure (e) and (f)} in

his classmates. He found two types of ear lobes in his classmates as per the frequency given below;

Sex	Free	Attached
Boys	36	12
Girls	31	10

- I. Which of the two characteristics - 'free ear lobe' or 'attached ear lobe' appears dominant in this case? Why?
- II. Is the inheritance of the free ear lobe linked with sex of the individual? Give reason for your answer.
- III. What type of ear lobe is present in father, mother, Rahul and his sister Nisha? Write the genetic constitution of each of these family members which explains the inheritance of this character in this family? (Gene for Free ear lobe is represented by 'F' and gene for attached ear lobe is represented by 'f' for writing the genetic constitution).
- IV. If both the parents are heterozygous for free ear lobe, what percentage of their offsprings will have attached ear lobes.

Q36. I. Write the activity which led to Fleming's left hand rule.

II. Draw related labelled diagram.

III. State Fleming's left hand rule.

IV. Write two uses of above rule in your daily life

OR

A student fixes a sheet of white paper on a drawing board. He places a bar magnet in the centre of it. He sprinkles some iron filings uniformly around the bar magnet. Then he taps the board gently and observes that the iron filings arrange themselves in a particular pattern. Then he did experiment with solenoid. Through this he came to know about solenoid and electromagnet.

I. What is Solenoid.

II. What does the crowding of iron filings at the end of the magnet indicate.

III. What is the difference between bar magnet and Solenoid.

IV. Draw a neat diagram to show the magnetic field lines around a bar magnet and solenoid.

V. Write the properties of magnetic field lines.

SEC -E

Q 37. Food, clothes, medicines, books and several things of daily use contain carbon as the basic constituent. The basic carbon compounds were extracted from natural substances. In other words all living structures are carbon based. The amount of carbon present in the earth crust is 0.02% and in the atmosphere 0.03% is quite meagre. Carbon forms the largest number of compounds more than any other tetravalent element

I. Name the term used for the branch of chemistry which deals with the study of carbon compounds.

II. Due to small amount of carbon available in nature is it necessary to start a drive save carbon, support your answer with suitable reason.

III. Name the first man made carbon compound.

IV. Define the term used for graphite and diamond, different forms of carbon

OR

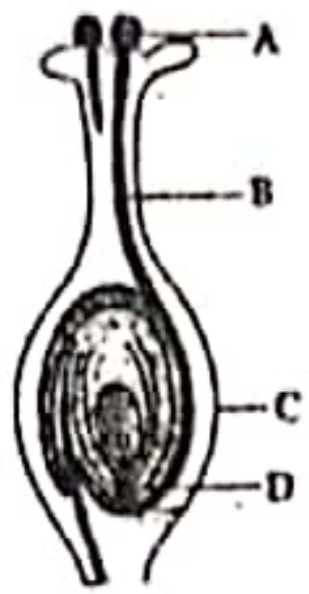
IV. How is carbon related to fossil fuels.

Q38. The given figure shows the reproductive part of an angiospermic plant. The flower may be unisexual (papaya, watermelon) when it contains either stamens or pistil. Bisexual flower (Hibiscus, Mustard) when it contains both stamens and pistil. Stamen produces pollen grain is the male reproductive part and pistil is the female reproductive part present in the centre of a flower.

I. What is the ploidy of A, when it lands on stigma and what will be the ploidy of D after fertilisation.

II. What changes occurs in stigma, sepal, petal, ovary and ovule after fertilisation ?

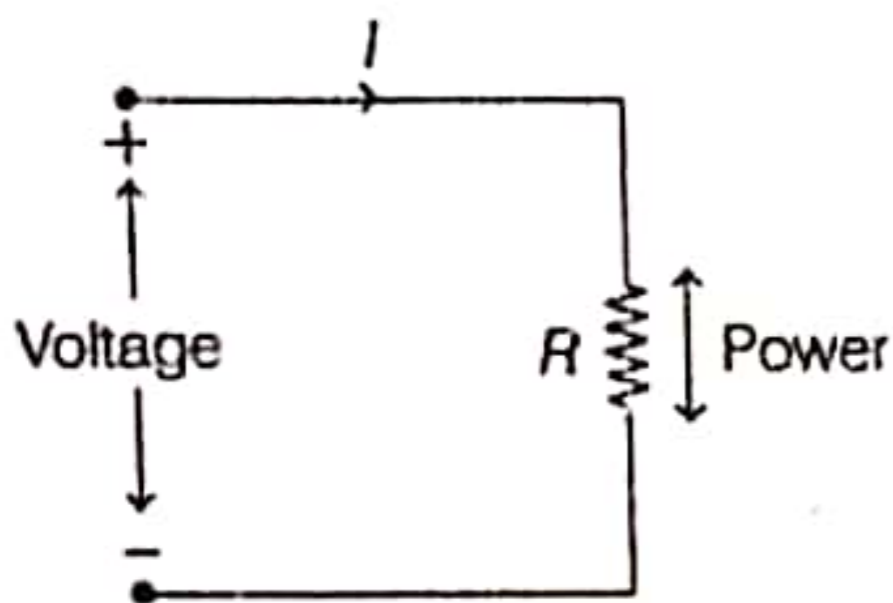
III. Name two possible agent by which A is transported to stigma.



OR

III. What is the fate of female germ cell after fertilisation.

Q39. Read the following and answer the questions :
The electrical energy consumed by an electrical appliance is given by the product of its power rating and the time for which it is used. The SI unit of electrical energy is Joule (as shown in figure).



Actually, Joule represents a very small quantity of energy and therefore it is inconvenient to use where a large quantity of energy is involved.

I. The energy dissipated by the heater is E . When the time of operating the heater is doubled, the energy dissipated is

- A. doubled B. half C. remains same D. four times

II. The power of a lamp is 60 W . The energy consumed in 1 minute is

- A. 360 J B. 36 J C. 3600 J D. 3.6 J

III. The SI unit of electric energy per unit time is

- A. Joule B. Joule-second C. Watt D. Watt-second

II. Kilowatt-hour is equal to

- A. $3.6 \times 10^4 \text{ J}$ B. $3.6 \times 10^6 \text{ J}$ C. $36 \times 10^6 \text{ J}$ D. $6 \times 10^4 \text{ J}$

OR

IV. Calculate the energy transformed by a 5 A current flowing through a resistor of 2Ω for 30 minutes.

- A. 40 kJ B. 60 kJ C. 10 kJ D. 90 kJ

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30/11/23