Class X Session 2026-27
Subject - Science
Sample Question Paper - **4**

Time Allowed: 3 hours **Maximum 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

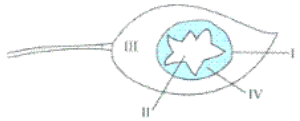
1. Fertilisation is the process of **[1]**

   a) transfer of male gamete to female gamete
   b) the formation of gametes by a reproductive organ
   c) adhesion of male and female reproductive organs
   d) fusion of nuclei of male and female gamete

2. The component of a chromosome that controls heredity is **[1]**

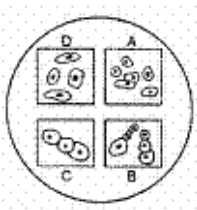
   a) RNA
   b) Histones
   c) DNA
   d) Proteins

3. A star-shaped black paper was used to cover a leaf in a destarched plant as shown below. The plant was left in sunlight for four hours and then the leaf was plucked, black paper removed and tested for the presence of starch. The areas which turned blue-black when iodine solution was added were **[1]**



   a) only II
   b) I, II, III, IV
   c) I, III, IV
   d) only IV

4. A student observed a slide of Yeast under a microscope and saw collection of cells in different parts of the slide marked A, B, C and D as shown below: **[1]**



   Which one of the following parts of the slide shows budding in yeast?

a) D
b) B
c) A
d) C

5. The ozone layer is mainly damaged by: **[1]**

a) Chlorofluorocarbons
b) Sulphur dioxide
c) Methane
d) Carbon dioxide

6. The **incorrect** statement about placenta is: **[1]**

a) It is a disc embedded in the uterine wall.
b) It has a very small surface area for glucose and oxygen to pass from mother to the embryo.
c) It contains villi on the embryo's side of the tissue.
d) The embryo gets nutrition from the mother's blood through it.

7. The production of which hormone in adults leads to a gorilla-like appearance called acromegaly? **[1]**

a) Growth hormone
b) Adrenaline
c) Thyroxine
d) Testosterone

8. **Assertion (A):** Pea plant is considered ideal for hybridisation experiments. **[1]**
Reason (R): Pea is self pollinating plant with short life cycle and bears visible contrasting traits.

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.

9. **Assertion (A):** Cytokinins are present in highest concentration in fruits and seeds. **[1]**
Reason (R): Cytokinins are responsible for promoting cell division.

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.

10. What would happen, if all the microorganisms are removed from the environment? **[2]**

11. What are trophic levels? Give an example of a food chain and state the different trophic levels in it. **[2]**

OR

What are the problems caused by the non-biodegradable wastes that we generate?

12. Draw a well-labelled diagram of a neuron. Name the part of a neuron: **[2]**
i. Where information is acquired.
ii. Through which information travels as an electrical impulse.

13. What is vegetative propagation? Name two methods in which this process is used to grow many plants. List any two advantages of vegetative propagation. **[3]**

14. Explain how urine is produced in kidneys. **[3]**

15. **Read the following text carefully and answer the questions that follow:** **[4]**

Nutrition is the process of taking food by an organism and the utilization of food for energy. This is a vital process that helps living beings obtain their energy from various sources.

Nutrients are substances that provide nutrition.

The mode of nutrition varies from one species to another. Plants do photosynthesis to prepare their own food. Animals depend on plants for food.



i. What do you understand by nutrition? (1)

ii. Mention how organisms like bread moulds and mushrooms obtain their food. (1)

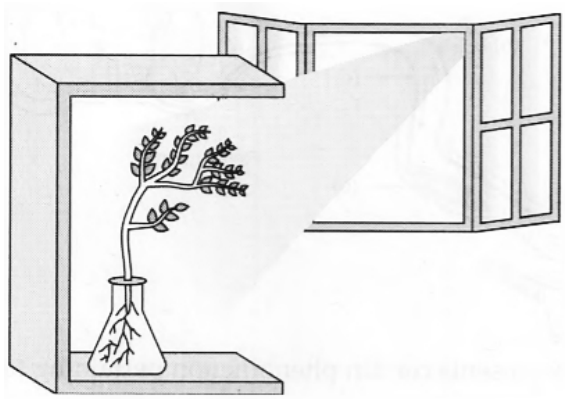
iii. What do you understand by autotrophic nutrition? (2)

OR

What is common for Cuscuta, ticks, and leeches? (2)

16. Give reasons for the appearance of new combinations of characters in the F_2 progeny. **[5]**

OR



Observe the above figure carefully and answer the following:

i. Which phenomenon does the figure represent?

ii. Which plant hormone is involved?

iii. How this plant hormone brings this movement?

Section B

17. Which of the following statements is not correct? **[1]**

a) Some metals react with acids to give salt and hydrogen.

b) Some non metal oxides react with water to form an acid.

c) All metal oxides react with water to give salt and acid.

d) All metal carbonates react with acid to give a salt, water and carbon dioxide.

18. Which of the following statement about the reaction below are incorrect? **[1]**

$2PbO(s) + C(s) \rightarrow 2Pb(s) + CO_2(g)$

(a) Lead is getting reduced.

(b) Carbon is getting oxidized

(c) Lead oxide is getting oxidized

(d) Lead oxide is getting reduced

a) (a) and (d)

b) (a) and (c)

c) (a) and (b)

19. Carbon forms four covalent bonds by sharing its four valence electrons with four univalent atoms, e.g. hydrogen. After the formation of four bonds, carbon attains the electronic configuration of **[1]**

a) argon

b) krypton

c) helium

d) neon

20. Match the following with the correct response: **[1]**

Column A	Column B
(i) Alcohol	(a) - X
(ii) Aldehyde	(b) - CHO
(iii) Ketone	(c) - OH
(iv) Haloalkane	(d) - CO -

a) (i) - (c), (ii) - (b), (iii) - (d), (iv) - (a)

b) (i) - (b), (ii) - (d), (iii) - (a), (iv) - (c)

c) (i) - (d), (ii) - (a), (iii) - (c), (iv) - (b)

d) (i) - (a), (ii) - (c), (iii) - (b), (iv) - (d)

21. Food cans are coated with tin and not with zinc because: **[1]**

a) Zinc is more reactive than tin.

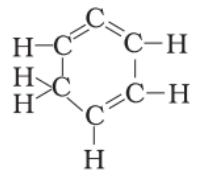
b) Zinc is costlier than tin.

c) Zinc is less reactive than tin.

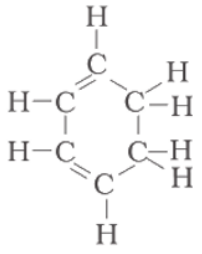
d) Zinc has a higher melting point than that of tin.

22. Structural formula of benzene is **[1]**

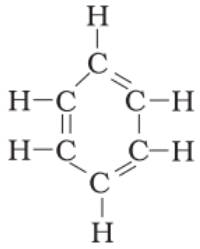
a)

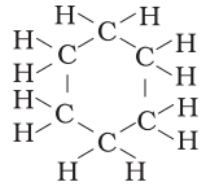


b)



c)



d) 

23. If the pH of a solution is 13, it means that it is **[1]**

a) Weakly acidic
b) Weakly basic
c) Strongly acidic
d) Strongly Basic

24. **Assertion (A):** A chemical reaction becomes faster at higher temperatures. **[1]**
Reason (R): At higher temperatures, molecular motion becomes more rapid.

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.

25. A student added few pieces of aluminium metal to two test tubes A and B containing aqueous solution of iron sulphate and copper sulphate. In the second part of her experiment, she added iron metal to another test tube C and D containing aqueous solution of aluminium sulphate and copper sulphate. **[2]**
In which test tube or test tubes will she observe colour change? On the basis of this experiment state which one is the most reactive metal and why?

26. i. In what form/forms does Carbon exists in the atmosphere? **[3]**
ii. What is the structural formula of ethyne?

OR

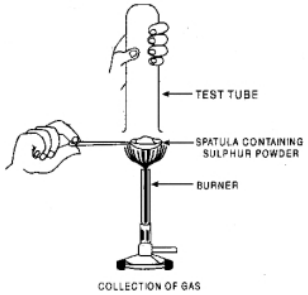
Write the molecular formula of the following compound and draw their electron dot structure.

i. Ethane
ii. Ethene
iii. Ethyne

27. Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by inverting a test tube over it, as shown in figure below. **[3]**

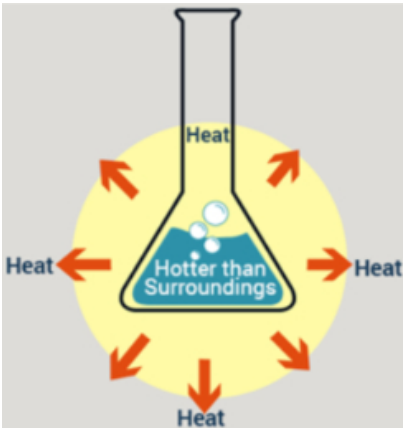
a. What will be the action of gas on
i. dry litmus paper?
ii. moist litmus paper?

b. Write a balanced chemical equation for the reaction taking place.



28. **Read the following text carefully and answer the questions that follow:** **[4]**
The dissolving of an acid or a base in water is a highly exothermic reaction. Care

must be taken while mixing concentrated nitric acid or sulphuric acid with water. The acid must always be added slowly to water with constant stirring. If water is added to a concentrated acid, the heat generated may cause the mixture to splash out and cause burns. The glass container may also break due to excessive local heating. Look out for the warning sign on the can of concentrated sulphuric acid and on the bottle of sodium hydroxide pellets.



i. What is the exothermic reaction? (1)

ii. Write an example of an exothermic reaction. (1)

iii. How will you obtain sulphuric acid from an acidic oxide? (2)

OR

While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid? (2)

29. The white solid compound A decomposes quite rapidly on heating in the presence of a black substance X to form a solid compound B and a gas C. When an aqueous solution of compound B is reacted with silver nitrate solution, then a white precipitate of silver chloride is obtained along with potassium nitrate solution. Gas C does not burn itself but helps to burn other things. **[5]**

i. What is compound A?

ii. What is compound B?

iii. What is gas C?

iv. What do you think is the black substance X? What is its function?

v. What is the general name of substances like X?

OR

i. On adding dilute HCl to a test tube containing sodium carbonate, an effervescence is observed. Explain the observation giving chemical equation for the reaction. How is the gas released tested in a school laboratory?

ii. What happens when excess carbon dioxide passes through lime water? Write chemical equations to explain your answer.

Section C

30. Which of the following statements is/are incorrect? **[1]**

A. A neutron has a positive charge of $+1.6 \times 10^{-19}$ C

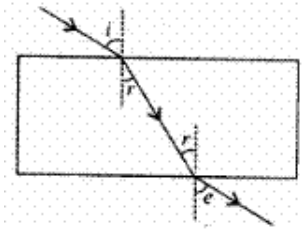
B. An ammeter is a low resistance device.

C. The resistance of semiconductors decreases with temperature.

D. One ampere is equal to 10^{-6} uA.

a) A and C
b) A, B and C
c) A and D
d) A and B

31. While performing the experiment on tracing the path of a ray of light passing through a glass slab as shown in the given diagram, four students interpreted the results as given below. Which one of the four interpretations in correct? **[1]**



a) $\angle r > \angle e$
b) $\angle i = \angle r$
c) $\angle r = \angle e$
d) $\angle i > \angle r$

32. **Assertion (A):** When ciliary muscles contract, eye lens becomes thin. **[1]**
Reason (R): Ciliary muscles control the power of the eye lens.

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.

33. Draw the pattern of magnetic field lines around a current carrying straight conductor. How does the strength of the magnetic field produced change: **[2]**
a. with the distance from the conductor?
b. with an increase in current in a conductor?

34. Compare the power used in the 2Ω resistor in each of the following circuits: **[2]**
(i) a 6 V battery in series with 1Ω and 2Ω resistors,and
(ii) a 4 V battery in parallel with 12 Ω and 2Ω resistors.

OR

100 J of heat is produced each second in a 4Ω resistance. Find the potential difference across the resistor.

35. i. An object of 5 cm height is placed at a distance of 20 cm from the optical centre of a concave lens of focal length 18 cm. Calculate (1) image distance and (2) the magnification in this case. **[3]**
ii. Compare the values of magnification obtained by a concave lens and a convex lens when both the lenses form virtual images.

36. A person uses lenses of power -0.5 D in his spectacles for the correction of his vision. **[3]**
a. Name the defect of vision the person is suffering from.
b. List two causes of this defect.
c. Determine the focal length of the lenses used in the spectacles.

37. Distinguish between a convex lens and a concave lens. **[3]**

38. Many pure metals like copper, iron and gold are very soft and as such are considered unsuitable for certain uses. Metallic objects around us such as cooking utensils, **[4]**

statues, ornaments, guns etc. are actually not made up of pure metals. Instead of pure metals, alloys are used in the design of most of the useful objects. Making alloys enhances the basic properties of a metal which is the primary constituent (metal) of an alloy.

I. How does electrical conductivity and melting point of a metal change when it is converted to its alloy by mixing a small amount of an element in it? **(1)**

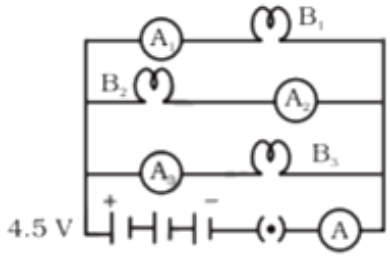
II. Name an alloy used for welding two wires together in an electric circuit. Write its major constituents. **(1)**

III. a. What are alloys? How is 'Brass' (an alloy) prepared? **(2)**

OR

b. What is stainless steel? How is it prepared? Write one important property which makes it more useful in making cooking utensils as compared to its primary metal. **(2)**

39. B_1, B_2, and B_3 are three identical bulbs connected as shown in the figure. When all the three bulbs glow, a current of 3A is recorded by the ammeter A. **[5]**



i. What happens to the glow of the other two bulbs when the bulb B_1 gets fused?

ii. What happens to the reading of A_1, A_2, A_3, and A when the bulb B_2 gets fused?

iii. How much power is dissipated in the circuit when all the three bulbs glow together?

OR

1. What is meant by the statement, The resistance of a conductor is one ohm?
2. Define electric power. Write an expression relating electric power, potential difference and resistance.
3. How many 132 Ω resistors in parallel are required to carry 5 A on a 220 V line?

Solution

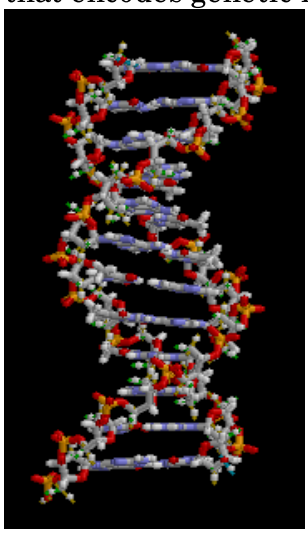
Section A

1.

(d) fusion of nuclei of male and female gamete
Explanation:
fusion of nuclei of male and female gamete

2.

(c) DNA
Explanation:
Heredity is the passing on of traits from parents to their offspring, either through asexual reproduction or sexual reproduction; the offspring cells or organisms acquire the genetic information of their parents.
Heritable traits are known to be passed from one generation to the next via DNA, a molecule that encodes genetic information.



3.

(c) I, III, IV
Explanation:
Photosynthesis takes place in the uncovered part which turns blue black when tested with iodine.

4.

(b) B
Explanation:
Buds appear as protuberance.

5. **(a)** Chlorofluorocarbons
Explanation:
The use of chemicals like CFCs has endangered the ozone layer. The decrease in the amount of ozone in the earth's atmosphere has been linked to synthetic chemicals like chlorofluorocarbons (CFCs). CFCs are used as refrigerants and in fire extinguishers.

6.

(b) It has a very small surface area for glucose and oxygen to pass from mother to the embryo.
Explanation:
It has a very small surface area for glucose and oxygen to pass from mother to the embryo.

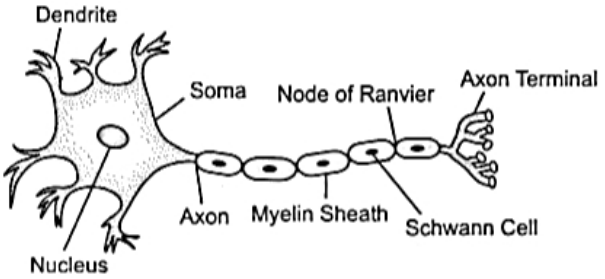
7. **(a)** Growth hormone
   Explanation:
   Growth hormone produces by the pituitary gland and when it acts on some tissues directly it cause gorilla or growth hormone disorder.
8. **(a)** Both A and R are true and R is the correct explanation of A.
   Explanation:
   Mendel chose pea plants for studying inheritance because of number of reasons. Pea plants are self-pollinating which enables them to produce next generation of plants easily, also pure lines could be easily obtained. Due to short life cycle, many generations of pea plants can be produced in a comparatively short span of time. Also, pea plant shows a number of clear-cut visible contrasting traits like tall and dwarf height, round and wrinkled seeds, etc.
9. **(b)** Both A and R are true but R is not the correct explanation of A.
   Explanation:
   Cytokinins are the hormones, which promote cell division. Highest concentrations of cytokinins occur in fruit and seeds, i.e., areas of rapid cell division.
10. If microrganisms are removed from the earth's environment then there would be dead bodies of plants and animals all around the Earth making it a difficult place to live in, more and more environmental pollution will pile up and accumalate. Moreover, the nutrient cycle will be stopped in the environment which will disturb the ecological balance.
11. Each step in a food chain through which the transfer of food takes place constitutes a trophic levels. For example,

Grass →	Dear →	Lion
Trophic level I	Trophic level II	Trophic level III

OR

Following problems are caused by the Non biodegradable waste:

a. Plastics which do not get decomposed get accumulated in soil, water bodies & pollute these natural resources.
b. Non-biodegradable substances like pesticides and fertilizers mix with run off to water & enter the water bodies. Excess fertilizers in water bodies cause excess growth of algae on the surface leading to oxygen depletion in water bodies, affecting the growth of aquatic organisms. Pesticides being toxic also affect the aquatic plants & animals.
c. Some of the non-biodegradable pesticides like DDT enter the food chain and cause biomagnification in humans and other animals.

12. 

i. Information is acquired at dendrites.
ii. Through axon information travels as an electrical impulse.

13. Vegetative propagation is an asexual method of plant reproduction that occurs in its leaves, roots and stem. This can occur through fragmentation and regeneration of specific vegetative parts of plants.
    Two methods employed to grow new plants through vegetative propagation.
    i. grafting
    ii. cutting

Advantages:

i. Vegetative propagation is a quicker, cheaper and easier method of plant propagation.

ii. It makes possible the production of seedless varieties such as banana, orange, jasmine etc.

14.
- Kidney has large number of filtration units called nephrons.
- Blood enters kidney and is filtered through a cluster of capillaries(glomerulus) and the filtrate is collected by a cup shaped structure (Bowman's capsule)
- Some substances as glucose, amino acids, salt and a major amount of water are selectively re-absorbed as the urine flows along the tube of nephron.

15. i. **Nutrition** is the process of taking food by an organism and the utilization of food for energy.

ii. Organisms like bread moulds and mushrooms break down the food materials outside the body and then absorb them. Mushroom has a **saprophytic** mode of nutrition.

iii. Plants are autotrophs and they have an autotrophic mode of nutrition. They perform photosynthesis to prepare their own food. Animals depend on plants for food.

OR

The Cuscuta, ticks, and leeches all are Parasites. A parasite receives its food from the host but gives no benefit to the host in return. The host may be a plant or animal.

16. The reason for the appearance of new combinations in the F_2 generation is given by the law of independent assortment. The law of independent assortment states that:

When two pairs of traits are combined in a hybrid, one pair of characters segregates independently of the other pair of characters.

In a dihybrid cross, when pea plants with round and green seeds (RRyy) are crossed with plants with wrinkled and yellow seeds (rrYY), round and yellow color (RrYy) seeds are produced in the F_1 generation. In the F_1 generation, the dominant alleles suppress the recessive ones. So, as a result, only the dominant allele is expressed. Thus, all the progenies in the F_1 generation showed dominant traits only. However, genes for recessive traits were present in all the plants.

When F_1 generation is crossed, they give rise to new combinations in the F_2 generation with round yellow, round green, wrinkled yellow, and wrinkled green in the ratio 9:3:3:1.

OR

i. The figure represents the phenomenon of phototropism i.e., response of plants to light.

ii. The plant hormone auxin is invoved in the phenomenon of phototropism.

iii. Plants show their growth towards light and this movement is caused by the action of auxin hormone. Auxin is synthesised by the meristematic tissue which is present at the tip of shoot, roots etc. In the above figure the plant bends towards the light. Auxin hormone is synthesised in the tip of the stem and moves towards the side of the plant not receiving light. Due to more auxin hormone in the region of the plant that does not receive light they grew faster than the part that receives light. So the stem bents towards the direction of light.

Section B

17.

(c) All metal oxides react with water to give salt and acid.

Explanation:

Metal oxides are basic in nature. They give alkaline solution when dissolved in water.

18.

(b) (a) and (c)

Explanation:

Here, lead oxide loses oxygen and hence reduced. Carbon gains oxygen and hence oxidized. And not lead is getting reduced. Carbon dioxide is not getting oxidized.

19.

(d) neon

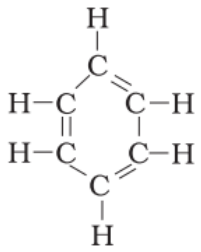
Explanation:

Electronic configuration of carbon is 2, 4 and after sharing four electrons from four univalent atoms, its electronic configuration becomes 2, 8 which is the same as that of Neon.

20. **(a)** (i) - (c), (ii) - (b), (iii) - (d), (iv) - (a)
Explanation:
- The general formula of an alcohol is R-OH.
- The general formula of an aldehyde is R-CHO.
- The general formula of a ketone is R-CO-R'.
- The general formula of a halo-alkane is R-X.

21. **(a)** Zinc is more reactive than tin.
Explanation:
Food cans are coated with tin and not zinc because zinc is more reactive than tin. If food cans are coated with zinc, zinc may react with food items and make them unfit for human consumption.

22. **(c)**



Explanation:
The formula of benzene is C_6H_6. In all the arms of carbon atoms are occupied.

23. **(d)** Strongly Basic
Explanation:
As the pH of the solution is 13 and the pH paper has values from 0 to 14.
Greater the pH, higher is the basicity, so the solution is strongly basic.

24. **(a)** Both A and R are true and R is the correct explanation of A.
Explanation:
A chemical reaction becomes faster at higher temperatures because at high temperature, the movement of particles are greater.

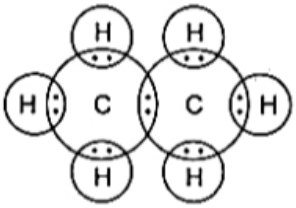
25. Only in test tubes A and B she will observe colour change from green to colourless in A. because aluminium is more reactive then iron it will displace iron. She will observe colour change from blue to colourless in test tube B. Aluminium is the most reactive metal because it displace all the other three metals.

26. i. Carbon dioxide only Carbon exists in the atmosphere in the form of carbon dioxide gas (CO_2) in the air (only 0.03%). Carbon also occurs in the earth's crust in the form of minerals likes carbonates. It also occurs in the form of fossil fuels, organic compounds, wood, cotton, and wool, etc.

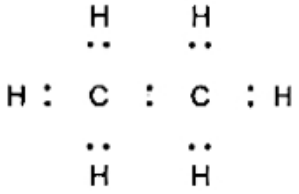
ii. H - C $\equiv$ C - H as the formula of ethyne is C_2H_2

OR

i. Ethane: C_2H_6

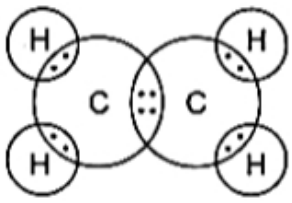


Structure of Ethane molecule

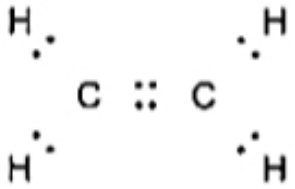


Electron dot structure of Ethane molecule.

ii. Ethene: C_2H_4

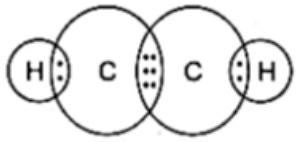


Structure of Ethene molecule



Electron dot structure of ethene molecule.

iii. Ethyne: C_2H_2



Structure of Ethyne molecule



Electron dot structure of Ethyne molecule.

27. a. i. No action.
ii. it turns moist litmus paper red and then bleaches it.

b. $S + O_2 = SO_2$

28. i. An exothermic reaction is a chemical reaction that releases energy through light or heat.
ii. Mixing of acid with water is a highly exothermic reaction.
iii. When sulphur trioxide (acidic oxide) is dissolved in water, an exothermic reaction takes place with the formation of sulphuric acid.

$SO_3 + H_2O \rightarrow H_2SO_4$

OR

Since the process of dissolving an acid in water is exothermic, it is always recommended that acid should be added to water. If it is done the other way, then it is possible that because of the large amount of heat generated, the mixture splashes out and causes burns.

29. i. The compound A is Potassium chlorate, $KClO_3$
ii. The compound B is Potassium chloride, KCl
iii. The gas G is Oxygen, O_2

iv. Manganese dioxide, MnO_2; it acts as a catalyst in the decomposition of potassium chlorate to form oxygen gas

v. The general name for substances like X is Catalysts.

OR

i.
- Effervescence is observed due to formation of CO_2 gas.
- $Na_2CO_3 + dilHCl \rightarrow NaCl + H_2O + CO_2 \uparrow$
- To test the gas, pass it through lime water, lime water will turn milky./

$$\underset{\text{(Lime water)}}{Ca(OH)_2(aq)} - CO_2(g) \rightarrow \underset{\text{(White precipitate)}}{CaCO_3(s)} - H_2O(l)$$

ii.
- When excess CO_2 passes through lime water, milkiness disappears.
- $$CaCO_3(s) + H_2O(l) + CO_2(g) \rightarrow \underset{\text{(Soluble in water)}}{Ca(HCO_3)_2(aq)}$$

Section C

30.

(c) A and D

Explanation:

B and C are correct. An ammeter is a low resistance device. A semiconductor material has an electrical conductivity value falling between that of a conductor, such as copper, and an insulator, such as glass. As the temperature increases, their resistance decreases.

A and D are incorrect. A neutron is a sub-atomic particle that has no charge. One μA is equal to 10^{-6} A. An ampere is a bigger unit. Micro-ampere (μA) is a smaller unit.

31.

(d) $\angle i > \angle r$

Explanation:

When light is entering from optically rarer to optically denser medium, the angle of incidence will be greater than the angle of refraction.

So, for parallel surfaces, refracting light, $\angle e = \angle i$ and for a denser medium $\angle r < \angle i$.

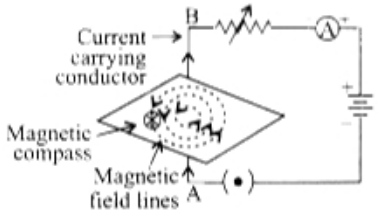
32.

(d) A is false but R is true.

Explanation:

A is false but R is true.

33.



a. The strength of a magnetic field is inversely proportional to the square of the distance from the conductor i.e., strength of an electric field decreases with increase in distance.

b. The strength of the magnetic field is directly proportional to the current passing in the wire i.e., strength of the magnetic field increases with the increase in current.

34. (i) When a 2Ω resistor is joined to a 6 V battery in series with 1Ω and 2Ω resistors. Total resistance (R_s) = 2 + 1 + 2 = 5Ω.

∴ Current (I_1) = 6V/5Ω = 1.2 A

∴Power used in 2 Ωresistor,$P_1 = I_1^2R = (1.2)^{2\times}2 = 2.88$ W

(ii) When 2Ω resistor is joined to a 4 V battery in parallel with 12Ω resistor and 2Ω resistors, the current flowing in 2Ω is independent of the other resistors.

$\therefore$ Current flowing through 2Ω resistor, I_2= 4 V/ 2Ω = 2 A

Power used in 2Ω resistor, $P_2 = I_2^2R = (2)^2 \times 2 = 8$ W

$\therefore$ The required ratio, P_1/P_2 = 2.88/8 = 0.36 : 1

OR

H = 100 J, R = 4Ω, t = 1 s, V = ?

From eq. $H = I^2Rt$ we have the current through the resistor as

$$I = \sqrt{(\frac{H}{Rt})}$$

$$= \sqrt{[(\frac{100J}{4\Omega \times 1s})]}$$

= 5A

Thus the potential difference across the resistor, V eq. V = IR is

V = IR

$= 5A \times 4\Omega$

= 20 V

35. i. The lens formula for a concave lens is:

$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

Substituting the given values, we get:

$\frac{1}{-18} = \frac{1}{v} - \frac{1}{-20}$

Simplifying the above equation, we get:

$\frac{1}{v} = \frac{1}{-18} - \frac{1}{-20}$

v = -180

v = -180 cm (negative sign indicates that the image is formed behind the lens)

Therefore, the image distance is 180 cm.

The magnification is given by the formula:

$m = \frac{-v}{u}$

Substituting the values, we get:

$m = \frac{-(-180)}{(-20)}$

m = -9

Therefore, the magnification is -9.

ii. A concave lens always forms a virtual, erect, and diminished image of a real object. On the other hand, when a convex lens forms a virtual image, the magnification can be greater than or less than 1, depending on the position of the object relative to the lens.

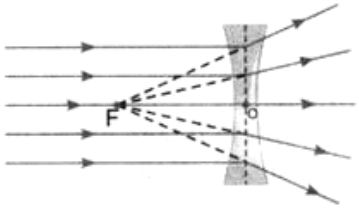
36. a. Myopia/Near Sightedness/Short sightedness

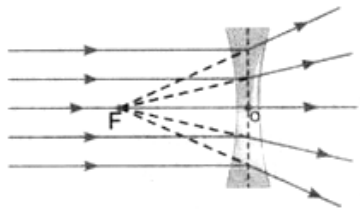
b. Two causes:

- Excessive curvature of eye lens
- Eye ball is elongated

c. $f(m) = 1/P = 1/-0.5 = -2m$

37.

Convex Lens	Concave Lens
1. It is a thicker at the center than at the edges. 2. Is has real Focus. 3. It converges a parallel beam of light on reflection through it.	1. It is thinner at the center than at the edges. 2. It has virtual focus. 3. It diverges a parallel beam of light on refraction through it. 4. 

4.		

38. I. Both electrical conductivity and melting point of an alloy becomes less than that of a pure metal. (Although in some cases the melting point may increases)

II.
- Solder
- Lead (Pb) & tin (Sn)

III. a.
- An alloy is a homogenous mixture of two or more metals or a metal and a nonmetal.
- Brass is an alloy is prepared by mixing Copper and Zinc in definite proportion.

OR

b.
- Stainless steel is an alloy of steel (iron) mixed with nickel and chromium.
- Iron is first mixed with small amount of carbon ($0 \cdot 05\%$) so that it becomes hard and strong when, then it is mixed with Ni and Cr metals, stainless steel is formed.
- Do not rust

39. i. There will be no effect on the glow of the other two bulbs and will remain the same when B_1 gets fused because the three bulbs are connected in parallel and the glowing of the bulb depends on power and the potential difference and resistance remains same of other two bulbs.

ii. When there are parallel connections:

Net resistance will be $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$

Since resistance is the same so, $R' = \frac{1}{R_3}$

Applying ohm's law V= IR

R = 4.5Ω

Since B_2 gets fused, so now only two bulbs B_1 and B_3 are in parallel

Therefore net resistance in parallel $\frac{1}{R'} = \frac{2}{R}$

R' = $\frac{4.2}{2}\Omega$

I = $\frac{V}{R'} = 2 \times \frac{4.5}{4.5}$

I = 2A

So, current will be distributed in both the bulbs as 1 A each.

iii. The power dissipated when all three bulbs glow together is

P = V × I

P= 4.5 × 3 = 13.5 W

OR

a. If the potential difference across the two ends of a conductor is 1 volt and the current through it is 1 ampere, then the resitance of the conductor is $1\ \Omega / 1\Omega = \frac{1 \text{ volt}}{1 \text{ ampere}}$

b. Electric Power is defined as the rate at which electric energy is consumed /dissipated.

$P = \frac{v^2}{R}$

c. To determine how many 132 ohm resistors in parallel are required to carry 5 A on a 220 V line, we can use Ohm's Law to find the total resistance needed for the circuit:

V = I×R

R = $\frac{V}{I}$

$= \frac{220 \text{ volt}}{5 \text{ ampere}}$

R = 44 Ω

Net Resistance = $\frac{132\Omega}{n}$, where n is the number of bulbs in parallel.

R = 44 = $\frac{132}{n}$

n = $\frac{132}{44}$ = 3 resistors