CCE SAMPLE QUESTION PAPER

SECOND TERM (SA–II)
SCIENCE (*Theory*)
(*With Solutions*)
CLASS X

Q.1. State one function of iris in human eye.   (1)

Ans. Iris controls the size of the pupil.

Q.2. Write the name and formula of the second member of the carbon compounds having functional group – OH.   (1)

Ans. Ethanol – CH_3CH_2OH or C_2H_5OH

Q.3. What is genetic drift ?   (1)

Ans. Gene migration or flow from a population if occurs by chance is called genetic drift.

Q.4. To construct ray diagram we use two light rays which are so chosen that it is easy to know their directions after reflection from the mirror. List these two rays and state the path of these rays after reflection. Use these rays to locate the image of an object placed between centre of curvature and focus of a concave mirror.   (2)

Ans. The position of the image formed by a spherical mirror can be found by considering any two of the following rays :

  (*i*) The ray incident parallel to the principal axis, after reflection, passes through the principal focus of a concave mirror or appears to pass through the principal focus of a convex mirror.

  (*ii*) A ray passing through the principal focus of a concave mirror or a ray directed towards the principal focus of a convex mirror is reflected parallel to the principal axis of mirror.

  (*iii*) A ray passing through the centre of curvature in a concave mirror or a ray directed towards the centre of curvature in a convex mirror, after reflection, retraces its path.

The location of image formed by a concave mirror for an object AB placed between centre of curvature and focus is shown in figure. The image A'B' is real, inverted, magnified and is formed beyond centre of curvature.
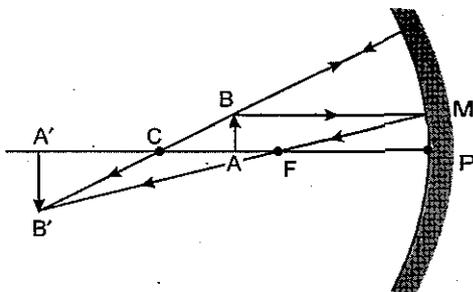
Q.5. Draw a labelled ray diagram to illustrate the dispersion of a narrow beam of white light when it passes through a glass prism. (2)

Ans. A labelled ray diagram illustrating the dispersion of a narrow beam of white light when it passes through a glass prism is shown below :
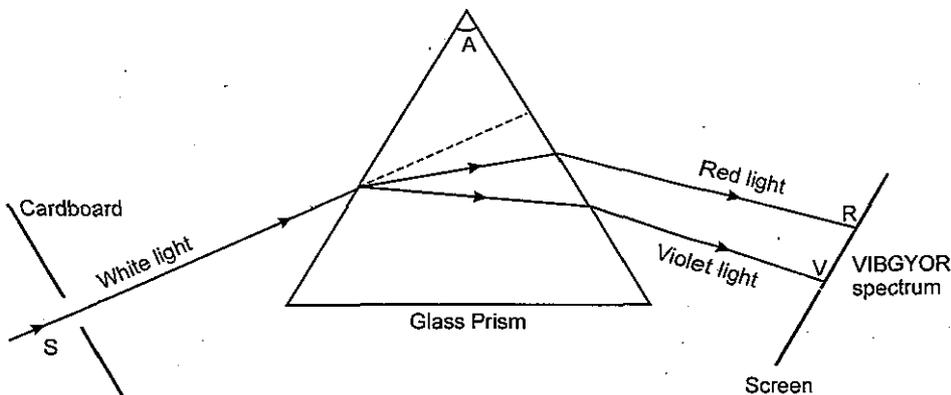
Q.6. If all the waste we generate is biodegradable, will this have no impact on the environment ? (2)

Ans. It will have only short term impact on environment. The action of decomposers will slow down and some air/water pollution will be caused. However, in longer term, there will be no impact of biodegradable waste on the environment.

Q.7. State the role of placenta in the development of embryo. (2)

Ans. After implantation, a disc like special tissue develops between the uterus wall and the embryo called placenta.

The exchange of nutrients, oxygen and waste products between the embryo and the mother takes place through the placenta.

Q.8. A star appears slightly higher (above) than its actual position in the sky. Illustrate it with the help of a labelled diagram. (3)

Ans. As we go up and up in earth's atmosphere, it goes on becoming rarer and more rarer. As a result, the atmospheric layer near the earth's surface has maximum refractive index and the refractive index gradually decreases with increase in height.

When light ray from a star enters into earth's atmosphere, it travels from rarer to denser medium and hence continues to bend towards the normal. As a result, an observer on earth considers the apparent position of star to be at a higher altitude as shown in figure.
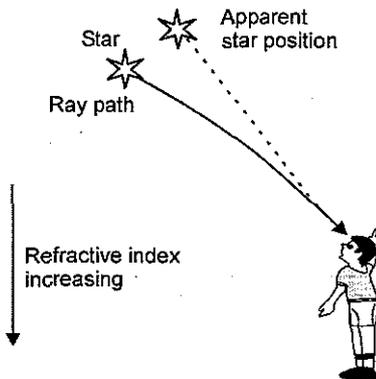
Q.9. State the types of mirrors used for (i) headlights and (ii) rear view mirrors, in cars and motorcycles. Give reason to justify your answer in each case. (3)

Ans. (i) Concave mirrors are used for headlights in cars and motorcycles. The lamp is set at the principal focus of concave mirror so that after reflection from concave mirror a powerful parallel beam of light travels in forward direction.

(ii) Convex mirrors are used as rear view mirrors in vehicles. These mirrors are fitted on the sides of the vehicle, enabling the driver to see traffic behind him/her to facilitate safe driving. It is convex mirrors give erect and diminished image of vehicles coming from behind. Thus, they have a wider field of view and enable the driver to view much larger area.

Q.10. A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 24 cm. The distance of the object from the lens is 16 cm. Find the position, size and nature of the image formed, using the lens formula. (3)

Ans. As per question, following the sign convention, we have

$$h = 4 \text{ cm}, u = -16 \text{ cm}, f = +24 \text{ cm}$$

From lens formula $\dfrac{1}{v} - \dfrac{1}{u} = \dfrac{1}{f}$, we have

$$\frac{1}{v} = \frac{1}{u} + \frac{1}{f} = \frac{1}{(-16)} + \frac{1}{24} = \frac{-3+2}{48}$$

$$\Rightarrow \qquad v = -48 \text{ cm}$$

The $-$ve sign of v shows that the image is on the same side of lens as the object is *i.e.*, the image is virtual.

Now $\qquad m = \dfrac{h'}{h} = \dfrac{v}{u} \Rightarrow h' = \dfrac{v}{u} \cdot h = \dfrac{(-48)}{(-16)} \times 4 = +12 \text{ cm}$

The +ve sign of h' shows that the image is an erect image.

Thus, a virtual erect image of length 12 cm is obtained at a distance of 48 cm from the lens on the side of object itself.

Q.11. An old man cannot see objects closer than 1 m from the eye clearly. Name the defect of vision he is suffering from. How can it be corrected ? Draw ray diagram for the (i) defect of vision and also (ii) for its correction. (3)

Ans. The old man is suffering from 'presbyopia', which is same as hypermetropia or long-sightedness but its cause is advanced age.

The defect of vision can be corrected by the use of convex (converging) lenses of appropriate power.

(i) The ray diagram showing defect of vision has been shown in Fig. (a) and (b). The person cannot see clearly an object situated at least distance of distinct vision because near point of defective eye has shifted farther from N to point N'.

(a)   (b)

(c)
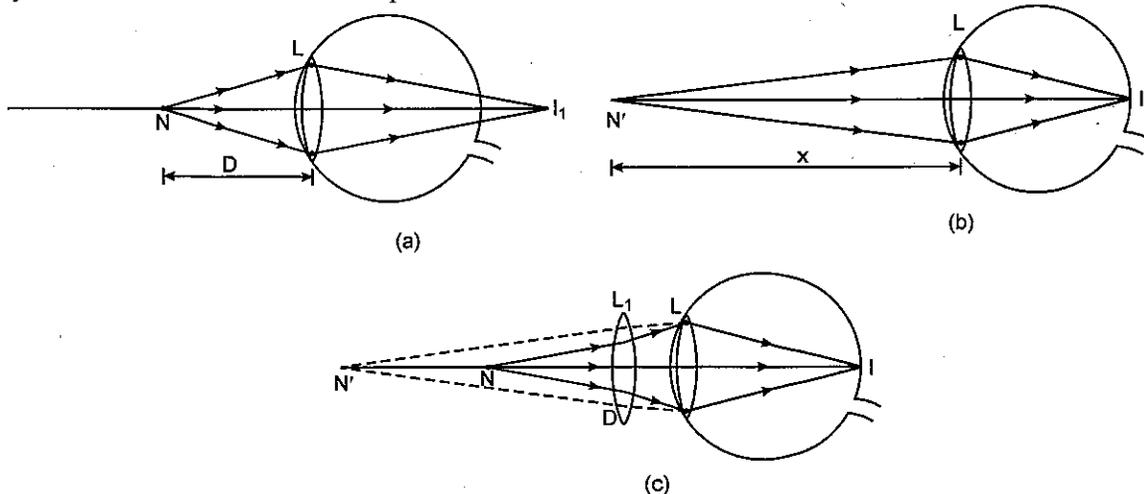
(ii) The ray diagram showing correction of the defect by the use of a convex lens has been shown in Fig. (c)

Q.12. List the products of combustion of fossil fuels. What are their adverse effects ? (3)

Ans. Products of combustion of fossil fuels are carbon dioxide, water, oxides of nitrogen and sulphur. When combustion takes place in insufficient air, carbon monoxide is also formed. Oxides of nitrogen and sulphur and carbon monoxide are poisonous gas. Carbon dioxide is a green-house gas. The layer of carbon dioxide around the earth prevents the heat rays to escape leading to global warming.

Q.13. What is meant by homologous series of organic compounds ? Write the chemical formulae of two members of a homologous series and state which part determines the (i) physical properties (ii) chemical properties of these compounds. (3)

Ans. A series of compounds in which the same functional group substitutes for hydrogen in a carbon chain is called homologous series. Two successive members of a homologous series differ by $-CH_2$ unit.

The formulae of two members of homologous series of aldehydes are

HCHO   Formaldehyde
CH_3CHO Acetaldehyde

The hydrocarbon part of the molecule determines the physical properties while the functional group determines the chemical properties.

Q.14. Na, Mg and Al are the elements having one, two and three valence electrons respectively. Which of these elements (i) has the largest atomic radius (ii) is least reactive ? Justify your answer stating reason for each. (3)

Ans. The position of an element in the Periodic Table tells us about its chemical reactivity. Valence electrons determine the kind and number of bonds formed by an element.
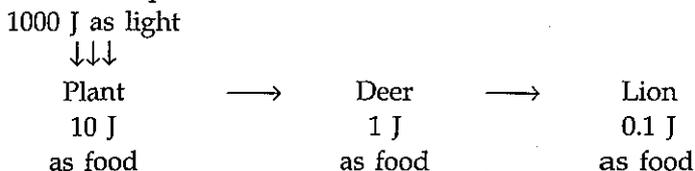
(i) **Atomic radius :** Na has the largest atomic radius. Na, Mg and Al occupy the third period of the periodic table. As we move from left to right in the period, the atomic radius decreases because there is an increase in nuclear charge which tends to pull the electrons closer to the nucleus and reduces the size of the atom.

(ii) **Reactivity :** Al is the least reactive of the three elements. This is because the valence electrons are most firmly attached to the nucleus compared to Na and Mg. Thus Al is the least reactive.

Q.15. What is ten per cent law ? Explain with an example how energy flows through different trophic levels. (3)

Ans. Energy available at each successive trophic level of food chain is ten per cent of that at the previous level.

This is called ten per cent law. Thus, 90 per cent energy is lost to the surroundings at each trophic level. However, plants absorb only one per cent of radiant energy of the Sun during photosynthesis. This is explained as under :

1000 J as light
$\downarrow\downarrow\downarrow$

Plant	$\longrightarrow$	Deer	$\longrightarrow$	Lion
10 J		1 J		0.1 J
as food		as food		as food

Q.16. List and explain in brief three methods of contraception. (3)

Ans. Various methods used for regulation of child birth can broadly categorised as :

(i) **Barrier Method :** In this method, physical devices such as condom, diaphragm, cervical cap and copper-T (IUCD) are used.

(ii) **Chemical Method :** Use of spermicidal jelly by woman, oral pills and vaginal pills. Oral pills are mainly hormonal preparations and are called Oral Contraceptive (OC).

(iii) **Surgical Method :** In surgical method, a small portion of vas deferens in male, and the fallopian tube in female, is surgically removed or ligated (tied). It is called vasectomy in males and tubectomy in females.

Q.17. If we cross pure-bred tall (dominant) pea plant with pure-bred dwarf (recessive) pea plant we will get pea plants of F_1 generation. If we now self-cross the pea plant of F_1 generation, then we obtain pea plants of F_2 generation.

(a) **What do the plants of F_1 generation look like ?**

(b) **State the ratio of tall plants to dwarf plants in F_2 generation.**

(c) **State the type of plants not found in F_1 generation but appeared in F_2 generation, mentioning the reason for the same.** (3)

Ans. (a) Like pure-bred pea plant.

(b) 3 Tall : 1 Dwarf.

(c) Pure dwarf as in F_2 generation segregation takes place.

Q.18. List in tabular form two distinguishing features between acquired traits and inherited traits, with one example of each. (3)

Ans.

Acquired traits	Inherited traits
(i) A trait of an organism which is not inherited but develops in response to the environment is called an acquired trait.	(i) A trait of an organism which is caused by a change in its gene is called an inherited trait.
(ii) The acquired traits of an organism cannot be passed on to the future generation. Example : If a beetle does not get sufficient food for a considerable time, its weight will be reduced due to starvation. The low weight of this beetle is an acquired trait.	(ii) Inherited traits can be transmitted to future generations because the changes have occurred in the genes. Example : If in a group of red beetle a colour variation arises during reproduction so that there is a beetle which is green in colour. This green colour of the beetle is an inherited character which can pass on to the next generation.

Q.19. How are fossils formed ? Describe, in brief, two methods of determining the age of fossils. (3)

Ans. When organisms (plants or animals) die, their bodies will decompose by the action of micro-organisms in the presence of oxygen, moisture, etc.

Sometimes in the lack of such conditions (oxygen, moisture, etc.), their body does not decompose completely and is preserved as fossil with the passage of time in the rocks. In many cases the soft parts of the organism get decomposed and hard parts (like bones etc.) become fossil. Sometimes even the soft parts (like leaf etc.) remain preserved as fossils in the form of their impressions inside the rocks.

Methods to determine the age of fossils :

(i) The fossils which we find in layers closer to the surface of the earth are more recent; the fossils which are found in deeper layers are older.

(ii) Fossils were once living objects and all living objects contain some carbon-14 atoms which are radioactive. When a living object dies and forms fossil, its carbon-14 radioactivity goes on decreasing gradually. The age of the fossil is found by comparing the carbon-14 radioactivity left in the fossil with the carbon-14 radioactivity present in the living objecs today.

Q.20. List the new Cartesian sign convention for reflection of light by spherical mirrors. Draw a diagram and apply these conventions for calculating the focal length and nature of a spherical mirror which forms a 1/3 times magnified virtual image of an object placed 18 cm in front of it. (5)

Ans. While considering reflection from spherical (curved) mirrors, we follow the New Cartesian Sign Convention. According to this convention :

(i) The object is taken on the left of the mirror, *i.e.,* the incident ray strikes the mirror from left hand side.

(ii) All the distances parallel to the principal axis are measured from the pole of the mirror.

(iii) Distances in the direction of the incident light are taken positive and in the opposite direction negative. In other words, distances right to the pole are taken positive and distances left to the pole negative.

(iv) The heights measured upwards (*i.e.*, above the principal axis) are taken positive and the heights measured downwards (below the principal axis) are taken negative.

As per question, the spherical mirror is forming a virtual image of an object which is smaller in size (as magnification $= \dfrac{1}{3}$), the mirror must be a convex mirror.

Here $u = -18$ cm and $m = +\dfrac{1}{3} = -\dfrac{v}{u}$
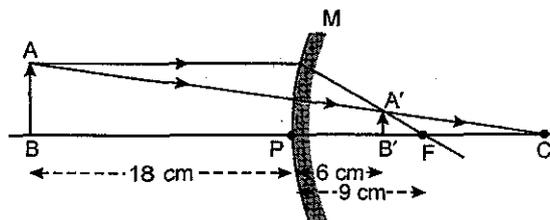
$$\Rightarrow \qquad v = -\dfrac{4}{3} = -\dfrac{-(18)}{3} = +6 \text{ cm}$$

$$\therefore \qquad \dfrac{1}{f} = \dfrac{1}{v} + \dfrac{1}{u} = \dfrac{1}{(+6)} + \dfrac{1}{(-18)}$$

$$= \dfrac{3-1}{18} = \dfrac{2}{18} = \dfrac{1}{9}$$

$$\Rightarrow \qquad f = +9 \text{ cm}$$

The ray diagram is shown here.

Or

With the help of a ray diagram, state what is meant by refraction of light. State Snell's law for refraction of light and also express it mathematically.

The refractive index of air with respect to glass is 2/3 and the refractive index of water with respect to air is 4/3. If the speed of light in glass is 2×10^8 m/s, find the speed of light in (a) air, (b) water.

Ans. Refraction of light is the phenomenon of bending of a ray of light when it obliquely enters from one transparent medium to another transparent medium. As shown in figure if a light ray enters from a rarer medium to a denser medium the light ray bends towards the normal. However, if light ray enters from a denser medium to a rarer medium, the ray bends away from the normal.

As per Snell's law for a given pair of transparent media the ratio of sine of the angle of incidence and sine of the angle of refraction is a constant.

Mathematically, $\dfrac{\sin i}{\sin r} = $ a constant $= \dfrac{n_2}{n_1} = n_{21}$

where n_1 and n_2 are the refractive indices of medium number 1 and 2 respectively and n_{21} is the refractive index of 2nd medium w.r.t. 1st medium.
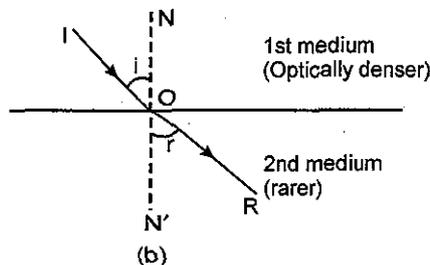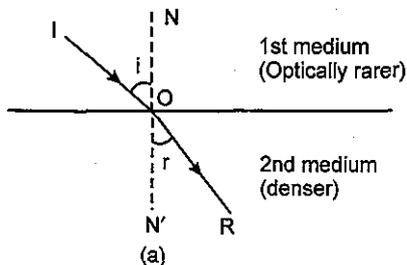
As per question, $n_{ag} = \dfrac{2}{3}$, $n_{wa} = \dfrac{4}{3}$ and speed of light in glass $v_g = 2 \times 10^8$ m/s

(i) If speed of light in air be v_a, then $n_{ag} = \dfrac{v_g}{v_a}$

$$\Rightarrow \qquad v_a = \dfrac{v_g}{n_{ag}} = \dfrac{2 \times 10^8}{2/3} = 3 \times 10^8 \text{ m s}^{-1}$$

(ii) If speed of light in water be v_w, then $n_{wa} = \dfrac{v_a}{n_w}$

$$\Rightarrow \qquad v_w = \dfrac{v_a}{n_{wa}} = \dfrac{3 \times 10^8}{4/3} = 2.25 \times 10^8 \text{ m s}^{-1}$$

Q.21. (a) **How do we classify elements ?**

(b) **What were the two criteria used by Mendeléev creating his Periodic Table ?**

(c) **Why did Mendeléev leave some gaps in his Periodic Table ?**

(d) **In Mendeléev's Periodic Table, why was there no mention of noble gases like helium, neon and argon ?**

(e) **Would you place the two isotopes of chlorine, Cl-35 and Cl-37 in different slots because of their different atomic masses or in the same slot because of their chemical properties are the same ? Justify your answer.** **(5)**

Ans. (a) We classify elements according to their properties so that we may obtain an orderly arrangement of elements and may study such a large number of elements with ease.

(b) Two criteria used by Mendeléev in creating his Periodic Table are :

(i) Atomic mass of the element (ii) Similarity in physical and chemical properties.

(c) Mendeléev believed that certain more elements existed but were not discovered till that time. He left some gaps in his periodic table so that these could be filled with elements discovered later.

(d) Noble gases like helium, neon and argon were not discovered till that time.

(e) Isotopes of chlorine, Cl-35 and Cl-37 will be placed in the same slot because their chemical properties are same. Electronic configuration and atomic number of the isotopes are the same. According to the Modern Periodic law, elements are arranged in order of their atomic numbers.

Or

(a) **What is Modern Periodic Law ?**

(b) **Atomic masses of nickel and cobalt are respectively 58.7 and 58.9. Which of them should appear first in the Periodic Table ?**

(c) **In which groups of the Periodic Table are the elements germanium and strontium present ?**

(d) **What is meant by the Law of Octaves ?**

(e) **Which has the bigger size**

(i) **out of chlorine and bromine ?**

(ii) **out of sodium and magnesium ?**

Ans. (a) Properties of an element are a periodic function of atomic number.

(b) According to atomic mass, Ni should be placed first and Co should appear after that. But they are not placed like this.

In reality, Co comes first and Ni comes thereafter. This is done because Co and Ni resemble other elements in their groups in their properties.

(c) Germanium is present in group 14.

Strontium is present in group 2.

(d) When the elements are arranged in order of atomic masses, every eighth elements has properties similar to that of the first.

(e) (i) Out of chlorine and bromine, bromine is bigger size. This is because chlorine has three filled shells of electrons while bromine has four shells.

(ii) Out of Na and Mg, Na is bigger. This is because the nuclear charge on Mg is more. It pulls the electrons towards itself with a bigger force, reducing its size.

Q.22. (a) Name the compound CH_3COOH and identify its functional group.

(b) Give a chemical test to identify this compound.

(c) Name the gas evolved when this compound acts on solid sodium carbonate. How would you identify this gas ? (5)

Ans. (a) CH_3COOH is ethanoic acid. It contains the functional group carboxylic acid.

(b) Ethanoic acid reacts with ethanol in the presence of conc. H_2SO_4, an ester is formed which has a fruity smell.

$$CH_3COOH + C_2H_5OH \xrightarrow{H^+} CH_3COOC_2H_5 + H_2O$$
<div align="center">Ester</div>
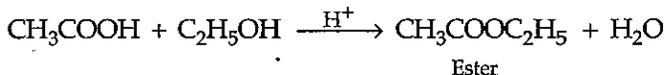
(c) Carbon dioxide gas is evolved when ethanoic acid acts on solid sodium carbonate.

$$2CH_3COOH + Na_2CO_3 \longrightarrow 2CH_3COONa + CO_2 + H_2O$$
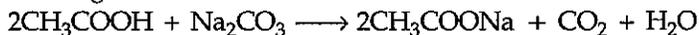
Carbon dioxide can be identified by passing through lime water which turns milky.

$$CO_2 + Ca(OH)_2 \longrightarrow CaCO_3 + H_2O$$
<div align="center">milkiness</div>
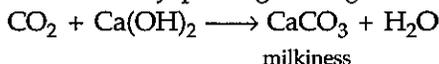
<div align="center">Or</div>

(a) Give a chemical test to distinguish between saturated and unsaturated hydrocarbons.

(b) (i) Name the products formed when ethanol burns in air.

(ii) What two forms of energy are liberated on burning alcohol ?

(c) Why is the reaction between methane and chlorine considered a substitution reaction ?

Ans. (a) Saturated and unsaturated hydrocarbons can be distinguished by adding bromine water.

Brown colour of bromine disappears with unsaturated hydrocarbon because of addition reaction. There is no change in the colour of bromine water when it acts on saturated hydrocarbon.

(b) (i) Carbon dioxide and water are formed when ethanol burns in air.

$$2C_2H_5OH + 7O_2 \longrightarrow 4CO_2 + 6H_2O$$

(ii) Heat and light are evolved in the above reaction.

(c) $$CH_4 + Cl_2 \longrightarrow CH_3Cl + HCl$$

Chlorine substitutes for hydrogen in methane forming chloromethane. Therefore, it is a substitution reaction.

Q.23. Distinguish between unisexual and bisexual flowers giving one example of each. Draw a diagram showing process of germination of pollen grains on stigma and label the following parts :
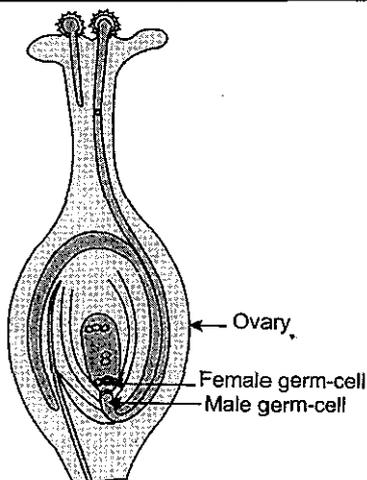
(i) Female germ cell

(ii) **Male germ cell**

(iii) **Ovary.**

Ans.

Unisexual flowers	Bisexual flowers
The flowers which contain only one sex organ, either stamen or carpel are called unisexual flowers. Example : Papaya and Watermelon	The flowers which contain both the sex organs, stamen as well as carpel are called bisexual flowers. Example : Hibiscus and Mustard plants.

Or ·

Draw a diagram of human female reproductive system and label the part

(i) **that produces eggs.**

(ii) **where fusion of egg and sperm takes place.**

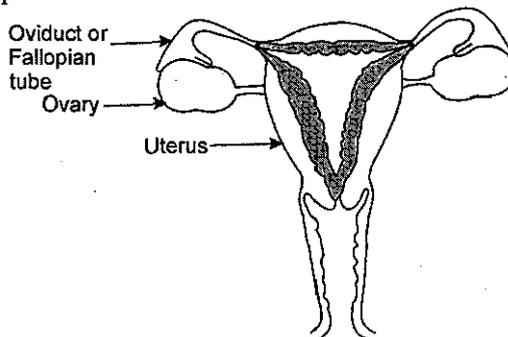(iii) **where zygote is implanted.**

What happens to human egg when it is not fertilised ?

Ans. Human female reproductive system :

(i) part that produces eggs – Ovary

(ii) where fusion of egg and sperm takes place – Fallopian tube

(iii) where zygote is implanted – Uterus

Human – female reproductive system

When human egg is not fertilised then the thick and soft inner lining of uterus is no longer needed and hence it breaks down in the form of vaginal bleeding known as menstruation.

Q.24. In Rahul's class, routine blood test was done to know the blood group of each student so that it could be entered in their Identity cards. Rahul was told that his blood group is O⁺. He already knew the blood group of his father is B type and that of mother of A type. He got confused why his blood group is O.

    (*a*) Is it possible that parents having A and B blood group can have children with O type blood group ?

    (*b*) What could be the possible blood group of Rahul's siblings ?

    (*c*) Do you see any other symbols along with your blood group test report ?

[Value Based Question] (5)

    Ans. (*a*) Yes, it is possible that parents having blood group A (AO) and B (BO) can have children with O blood group.

    (*b*) A, AB and O blood groups are the possible blood groups of Rahul's siblings.

    (*c*) Yes, its either Rh⁺ or Rh⁻ symbols written along the blood group.

SECTION B

Q.25. A student has to determine the focal length of a concave mirror by obtaining the image of a distant object on a screen. For getting best result he should focus   (1)

    (*a*) a distant tree or an electric pole.

    (*b*) a well-illuminated distant building.

    (*c*) well-lit grills of the nearest window.

    (*d*) a burning candle placed at the distant edge of the laboratory table.

    Ans. (*b*) A student should focus a well-illuminated distant building.

Q.26. A student obtained a sharp inverted image of a distant tree on a screen placed in front of the concave mirror. He then removed the screen and tried to look into the mirror. He would now see   (1)

    (*a*) a very blurred image on the wall opposite to the mirror.

    (*b*) an erect and magnified image of the tree in the mirror.

    (*c*) no image as the screen has been removed.

    (*d*) a highly diminished inverted image of the tree at the focus of the mirror.

    Ans. (*d*) If a student removes the screen and tries to look into the mirror he would now see a highly diminished inverted image of the tree at the focus of the mirror.

Q.27. If you are to determine the focal length of a convex lens, you should have   (1)

    (*a*) a convex lens and a screen.

    (*b*) a convex lens and a lens holder.

    (*c*) a lens holder, a screen holder and a scale.

    (*d*) a convex lens, a screen, holders for them and a scale.

    Ans. (*d*) To determine the focal length of a convex lens one should have a convex lens, a screen, holders for them and a scale.

Q.28. While performing the experiment on tracing the path of a ray of light through a rectangular glass slab, in which of the following experimental set-ups is a student likely to get best results ?

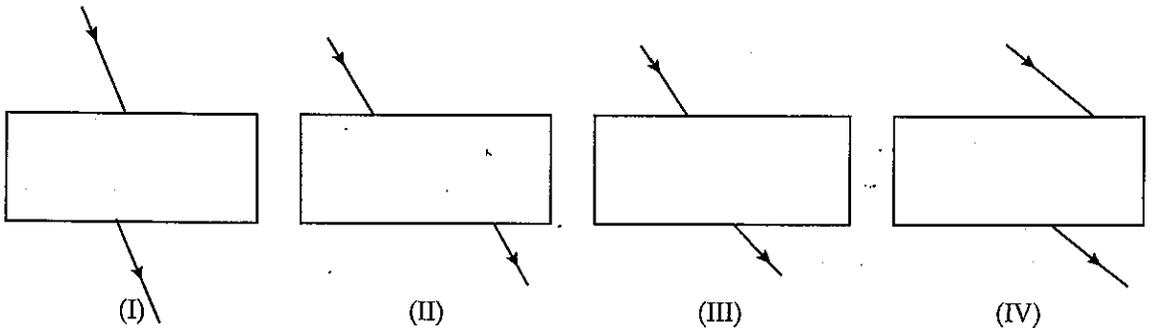P_1 and P_2 are the positions of pins fixed by him. (1)

(I) (II) (III) (IV)
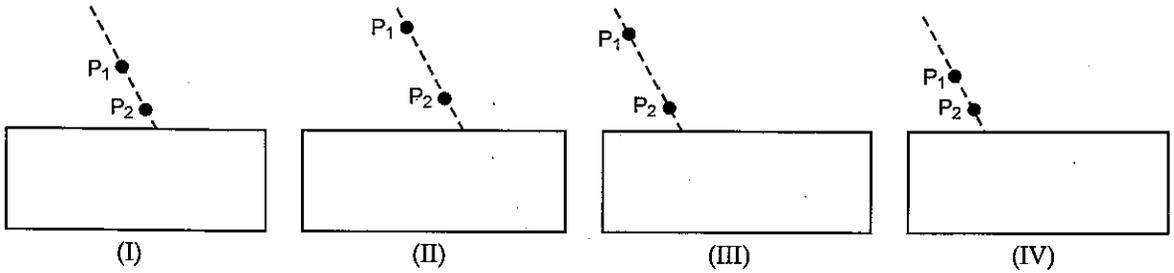
(a) I (b) II
(c) III (d) IV

Ans. (b) Experimental set up (II) will give best results.

Q.29. Four students showed the following traces of the path of a ray of light passing through a rectangular glass slab.

(I) (II) (III) (IV)

The trace most likely to be correct is that of student (1)

(a) I (b) II
(c) III (d) IV

Ans. (c) Trace of student (III) is most likely to be correct.

Q.30. An object is placed at a distance of $2f$ on one side of a convex lens. Then its image is formed (1)

(a) on other side of lens at $2f$ distance from the lens.
(b) on same side of lens at $2f$ distance from the lens.
(c) between f and $2f$ on other side of lens.
(d) beyond $2f$ on other side of lens.

Ans. (a) When an object is placed at a distance of $2f$ on one side of a convex lens, its real image is formed on other side of lens at $2f$ distance.

Q.31. Which of the following diagram represents refraction of light correctly through a prism ? (1)

(I) (II) (III) (IV)
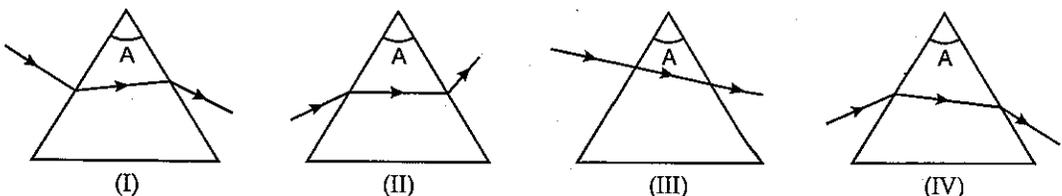
(*a*) I　　　　　　(*b*) II　　　　　　(*c*) III　　　　　　(*d*) IV

Ans. (*d*) Fig. (IV) correctly represents refraction of light through a prism.

Q.32. On adding acetic acid to sodium hydrogen carbonate in a test tube, a student observes (1)
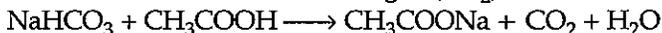
　　(*a*) no reaction.
　　(*b*) a colourless gas with pungent smell.
　　(*c*) bubbles of a colourless and odourless gas.
　　(*d*) a strong smell of vinegar.

Ans. (*c*) Bubbles of a colourless and odourless gas (CO_2) are formed.

$$NaHCO_3 + CH_3COOH \longrightarrow CH_3COONa + CO_2 + H_2O$$

Q.33. On adding 2 mL acetic acid to 2 mL of water in a test tube, it was observed that (1)

　　(*a*) a clear and transparent solution is formed.
　　(*b*) a white precipitate is formed almost immediately.
　　(*c*) two separate layers were formed.
　　(*d*) a colourless and odourless gas is evolved.

Ans. (*a*) A clear and transparent solution is formed. There is no chemical reaction between acetic acid and water. The two liquids are completely miscible, therefore no separate layers are formed.

Q.34. Which one of the following is the correct observation about acetic acid ? (1)
　　(*a*) It turns blue litmus red and smells like vinegar.
　　(*b*) It turns blue litmus red and smells like burning sulphur.
　　(*c*) It turns red litmus blue and smells like vinegar.
　　(*d*) It turns red litmus blue and has a fruity smell.

Ans. (*a*) Being an acid, it turns blue litmus red. Also it has a vinegar smell.

Q.35. Tick the correct statement : (1)
　　(*i*) Sodium hydroxide is used in the preparation of washing soap.
　　(*ii*) Sodium carbonate is used in the preparation of washing soap.
　　(*iii*) Potassium hydroxide is used in the preparation of toilet soap.
　　(*iv*) Potassium carbonate is used in the preparation of toilet soap.
　　(*a*) (*i*) and (*ii*)　　　　　　　　　(*b*) (*i*) and (*iv*)
　　(*c*) (*i*) and (*iii*)　　　　　　　　　(*d*) (*iii*) and (*iv*)

Ans. (*c*) Sodium hydroxide is used in the manufacture of washing soap. Potassium hydroxide is less corrosive, therefore, it is used in the preparation of toilet soaps.

Q.36. A saponification reaction was performed in a test tube by taking oil and sodium hydroxide solution. The mixture was stirred. After some time, soap settled down at the bottom of the test tube.
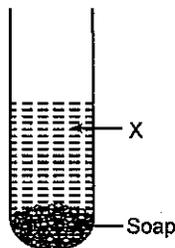
The supernatant liquid X is (1)
  (a) Sodium hydroxide   (b) Oil
 (c) Glycine   (d) Glycerol
Ans. (d) Glycerol is formed as a by-product in the saponification reaction.

Q.37. Presence of calcium and magnesium salts in water precipitates the soap and (1)
  (a) reduces its cleansing power and foaming capacity.
  (b) reduces its cleansing power but foaming capacity remains unchanged.
  (c) does not reduce cleansing power but reduces foaming capacity.
  (d) neither cleansing power nor foaming capacity is reduced.
Ans. (a) Precipitation of soap reduces both the cleansing power and the foaming capacity.

Q.38. Following diagrams were drawn by different students on having seen prepared slides of budding in yeast.
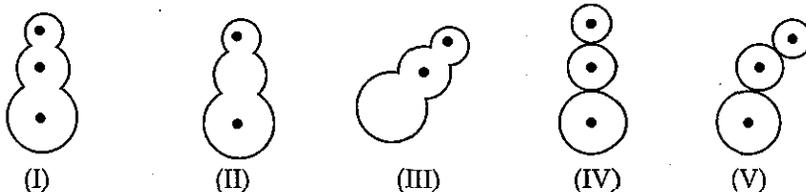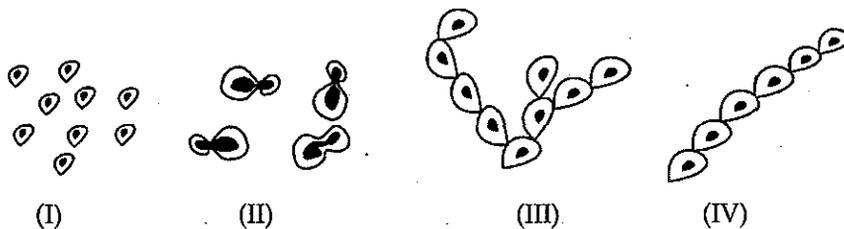

(I)   (II)   (III)   (IV)   (V)

Correct diagrams are (1)
  (a) I, II, III   (b) II, III, IV
  (c) III, IV, V   (d) I, IV, V
Ans. (d) Self explanatory.

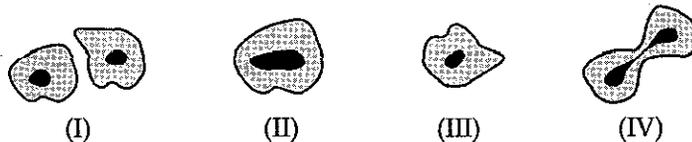Q.39. In which of the following figures is budding not shown ? (1)

(I)   (II)   (III)   (IV)

  (a) I   (b) II
  (c) III   (d) IV
Ans. (a) Self explanatory.

Q.40. The following figures illustrate binary fission in Amoeba in an incorrect sequence.

(I)   (II)   (III)   (IV)

The correct sequence is (1)
  (a) III, II, IV, I   (b) III, IV, II, I
  (c) II, III, IV, I   (d) IV, III, II, I
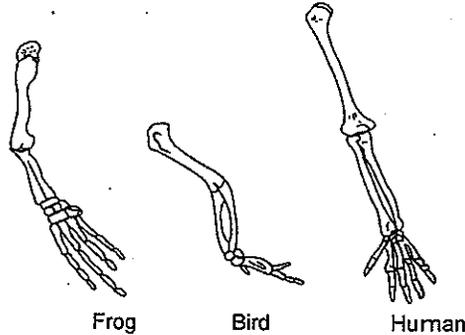Ans. (a) Self explanatory.

Q.41. **What is the function of a cotyledon ?** (1)
    (*a*) Absorb oxygen for respirations.
    (*b*) It has no functions.
    (*c*) Provides nutrition to the seeds.
    (*d*) Absorbs water from soils.
 Ans. (*c*) This is the correct answer.
Q.42.

             Frog   Bird   Human

What evolutionary concept is illustrated by the above images ? (1)
    (*a*) Variation among species.   (*b*) Vestigial structures.
    (*c*) Homologous structures.   (*d*) Embryological similarities.
 Ans. (*c*) These are Homologous structures.