

CCE SAMPLE QUESTION PAPER

SECOND TERM (SA-II)

SCIENCE (Theory)

(With Solutions)

CLASS X

Time Allowed : 3 Hours]

[Maximum Marks : 90

General Instructions :

- (i) The question paper comprises of two Sections, A and B, you are to attempt both the Sections.
- (ii) All questions are compulsory.
- (iii) All questions of Section A and all questions of Section B are to be attempted separately.
- (iv) Question numbers 1 to 3 in Section A are one mark questions. These are to be answered in one word or one sentence.
- (v) Question numbers 4 to 7 are two marks questions, to be answered in about 30 words.
- (vi) Question numbers 8 to 19 are three marks questions, to be answered in about 50 words.
- (vii) Question numbers 20 to 24 are five marks questions, to be answered in about 70 words.
- (viii) Question numbers 25 to 42 in Section B are multiple choice questions based on practical skills. Each question is a one mark question. You are to choose one most appropriate response out of the four provided to you.

Q.1. What will be the colour of the sky when it is observed from a place in the absence of any atmosphere ? (1)

Ans. Black (dark).

Q.2. Name the functional group present in each of the following organic compounds :
(i) C_2H_5Cl (ii) C_2H_5OH (1)

Ans. (i) Chloro group (ii) Alcoholic group.

Q.3. What is the effect of DNA copying which is not perfectly accurate on the reproduction process ? (1)

Ans. It will lead to variation in progeny.

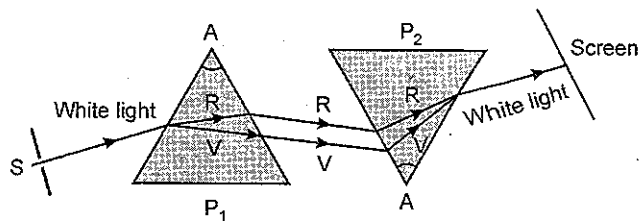
Q.4. List four properties of the image formed by a plane mirror. (2)

Ans. The image of an object formed by a plane mirror has the following properties :

1. The image formed is virtual and erect.
2. The image is of exactly the same size as the object.
3. The image is formed as far behind the mirror as the object is in front of it.
4. The image is laterally inverted.

Q.5. When we place a glass prism in the path of a narrow beam of white light a spectrum is obtained. What happens when a second identical prism is placed in an inverted position with respect to the first prism ? Draw a labelled ray diagram to illustrate it. (2)

Ans. When a second identical prism is placed in an inverted position with respect to the first prism, the spectrum is no more visible. In fact, the seven coloured rays recombine to form white light again as shown in figure below.



Q.6. What are the problems caused by non-biodegradable wastes that we generate ? (2)

Ans. (i) Non-biodegradable pesticides and fertilizer run off with rain water to water bodies cause water pollution and affect the soil by making it either acidic or alkaline.

(ii) Some of the non-biodegradable pesticides like DDT enter the food chain and cause biomagnification in humans and other animals.

Q.7. State one genetically different feature between sperms and eggs of humans. What is its consequence ? (2)

Ans. 50% of sperm has X chromosome while 50% of sperm has Y chromosome, while all eggs have X chromosome only.

When sperm having X chromosome fertilises the egg a female child is conceived and when sperm having Y chromosome fertilises the egg a male child is conceived.

Q.8. A star sometimes appears brighter and some other times fainter. What is this effect called ? State the reason for this effect. (3)

Ans. The effect is called twinkling of star.

A star twinkles due to the phenomenon of atmospheric refraction. As the star is very far away, it behaves almost as a point source of light. On account of atmospheric refraction the path of light ray coming from a star goes on varying slightly. As a result, the apparent position of the star fluctuates and the amount of star light entering the observer's eye also flickers. As a result, the star sometimes appear brighter and at some other time fainter. Thus, the star twinkles.

Q.9. State the type of mirror preferred as (i) rear view mirror in vehicles, (ii) shaving mirror. Justify your answer giving two reasons in each case. (3)

Ans. (i) A convex mirror is used as rear view mirror in vehicles so as to enable the driver to see traffic behind him to facilitate safe driving due to following two reasons :

(a) They give an erect and diminished image.

(b) They have a wider field of view i.e., they enable the driver to view much larger area than would be possible with a plane mirror.

(ii) A concave mirror is used as a shaving mirror due to following reasons :

(a) It forms an erect and magnified image of the face.

(b) As image is of larger size the person doing the shave can see clearly presence of any hair left on the face and thus can have a better shave.

Q.10. The image of a candle flame placed at a distance of 45 cm from a spherical lens is formed on a screen placed at a distance of 90 cm from the lens. Identify the type of lens and calculate its focal length. If the height of the flame is 2 cm, find the height of its image. (3)

Ans. As the image is being formed on a screen, the image must be a real image and the lens used must be a convex lens. Hence, as per sign convention followed, we have $u = -45$ cm, $v = +90$ cm and $h = +2$ cm

$$\therefore \frac{1}{f} = \frac{1}{v} - \frac{1}{u} = \frac{1}{(+90)} - \frac{1}{(-45)} = \frac{1}{90} + \frac{1}{45} = \frac{1+2}{90} = \frac{3}{90} = \frac{1}{30}$$

$$\Rightarrow f = +30 \text{ cm}$$

If height of the image be h' , then $\frac{h'}{h} = \frac{v}{u}$

$$\Rightarrow h' = \frac{v}{u} \cdot h = \frac{(+90)}{(-45)} \times (+2) = -4 \text{ cm}$$

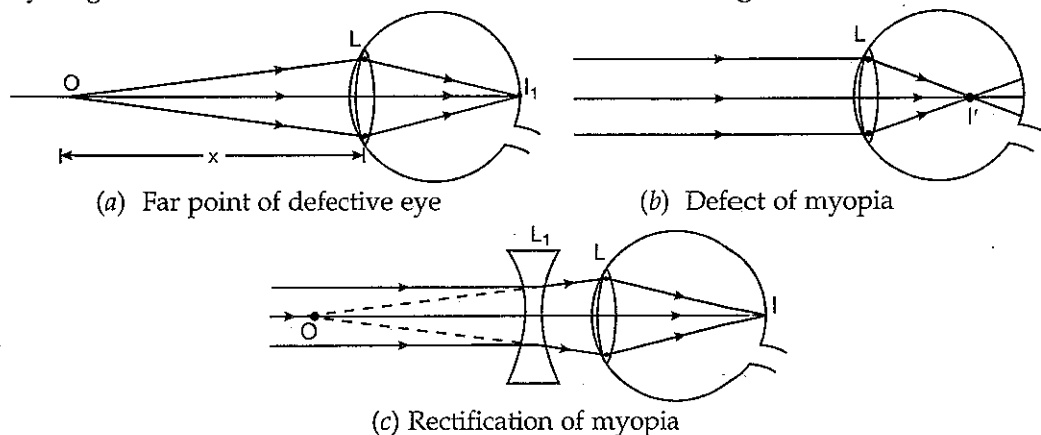
The -ve sign signifies that the image of the flame is an inverted image.

Q.11. A student cannot see a chart hanging on a wall placed at a distance of 3 m from him. Name the defect of vision he is suffering from. How can it be corrected? Draw ray diagrams for the (i) defect of vision and also (ii) for its correction. (3)

Ans. The student is suffering from myopia (or nearsightedness).

The defect can be corrected by using a suitable concave lens. If far point of defective eye is at a distance x , then one should use a concave lens of focal length $f = -x$.

Ray diagrams for the defect of vision and for its correction are given below :



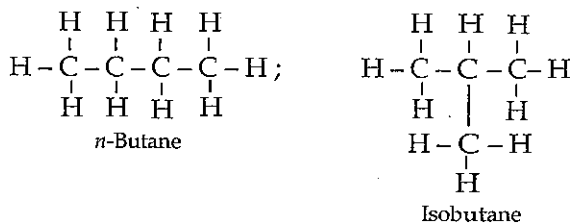
Q.12. "Burning fossil fuels is a cause of global warming." Justify this statement. (3)

Ans. We burn fossil fuels like coal and petroleum to run the industries and automobiles. With every passing year, the consumption of fossil fuels is increasing due to increasing demands of manufactured goods and automobiles. These fuels on consumption produce carbon dioxide which forms an envelope around earth. It traps the outgoing heat leading to global warming.

Q.13. What are isomers? Draw the structures of two isomers of butane, C_4H_{10} . Why can't we have the isomers of first three members of alkane series? (3)

Ans. Compounds which have the same molecular formulae but differ in their physical and chemical properties due to different structures are called isomers.

Two isomers of butane are :



Q.14. F, Cl and Br are the elements each having seven valence electrons. Which of these (i) has the largest atomic radius, (ii) is most reactive ? Justify your answer stating reason for each. (3)

(ii) **Reactivity** : As we move down the group in the periodic table, tendency to gain electrons *i.e.*, electronegativity decreases. Halogens react by gaining the electrons. Therefore, reactivity decreases down the group. Hence F is the most reactive.

Ans. Ozone layer protects the earth from the harmful effects of ultraviolet radiations. Damage to ozone layer will result in UV rays reaching the earth and will cause skin cancer, cataract and damage to immune system.

(i) Minimise the use of chlorofluorocarbons (CFCs).

(ii) Freeze CFC production at 1986 level as per UNEP recommendations.

(iii) Devise chemicals in place of CFCs to perform by their functions.

Q.16. Explain the meaning of sexually transmitted diseases (STDs). Give two examples of STDs each, caused due to (i) bacterial infection and (ii) viral infection. State in brief how the spread of such diseases may be prevented. (3)

Ans. Sexually Transmitted Diseases (STDs) are the diseases which are spread by sexual contact from an infected person to a healthy person.

Examples of bacterial infections are gonorrhoea and syphilis, and viral infections are warts and HIV-AIDS.

Using a condom during sex helps to prevent transmission of many of these infections to some extent.

Q.17. A blue colour flower plant denoted by BB is crossbred with that of white colour flower plant denoted by bb.

(a) State the colour of flower you would expect in their F_1 generation plants.

(b) What must be the percentage of white flower plants in F_2 generation if flowers of F_1 plants are self-pollinated?

(c) State the expected ratio of the genotypes BB and Bb in the F₂ progeny. (3)

Ans. (a) Blue colour

(b) 25%

(c) 1BB : 2Bb.

Q.18. What is meant by the term speciation ? List four factors which could lead to speciation.

(3)

Ans. Speciation refers to evolution of a new species.

Factors which could lead to speciation :

(i) Genetic drift

(ii) Mutations

(iii) Natural selection

(iv) Artificial selection

Q.19. Distinguish between homologous organs and analogous organs. In which category would you place wings of a bird and wings of a bat ? Justify your answer giving a suitable reason.

(3)

Ans. **Homologous organs** : Such organs which perform different functions but have similar structure and origin are called homologous organs. For example, wings of a bird, forelimb of man and frog perform different functions, but have similar internal structure. Presence of such organs indicate that all these vertebrates had common ancestors.

Analogous organs : Such organs which perform similar functions but are structurally different are called analogous organs. For example, wings of a bird and wing of an insect. Presence of such organs show that these organisms have different origin.

Wings of a bird and bat if considered morphologically they will be considered analogous organs as the wing of bat is a flap of skin. But if we consider anatomy of their wing they will be considered homologous organs as both have similar bone set.

Q.20. List the sign conventions for reflection of light by spherical mirrors. Draw a diagram and apply these conventions in the determination of focal length of a spherical mirror which forms a three times magnified real image of an object placed 16 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.

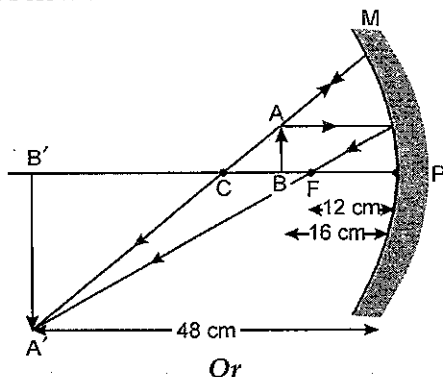
Following the above mentioned sign convention we have :

$$u = -16 \text{ cm}, m = -3 \text{ (because image is real)}$$

$$\text{As } m = -\frac{v}{u}, \text{ hence } v = -mu = -(-3)(-16) = -48 \text{ cm}$$

$$\therefore \frac{1}{f} = \frac{1}{v} + \frac{1}{u} = \frac{1}{(-48)} + \frac{1}{(-16)} = \frac{1+3}{(-48)} = -\frac{1}{12} \Rightarrow f = -12 \text{ cm}$$

The ray diagram is shown below :



State the law of refraction of light that defines the refractive index of a medium with respect to the other. Express it mathematically. How is refractive index of any medium 'A' with respect to a medium 'B' related to the speed of propagation of light in two media A and B? State the name of this constant when one medium is vacuum or air.

The refractive indices of glass and water with respect to vacuum are $\frac{3}{2}$ and $\frac{4}{3}$ respectively. If the speed of light in glass is 2×10^8 m/s, find the speed of light in (i) vacuum, (ii) water.

Ans. Snell's law of refraction defines the refractive index of a medium with respect to the other. 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,

$$\frac{\sin i}{\sin r} = \text{a constant} = \frac{n_2}{n_1} = n_{21}$$

If refractive index of medium A with respect to medium B be n_{AB} and speed of propagation of light in media A and B be v_A and v_B respectively, then

$$n_{AB} = \frac{n_A}{n_B} = \frac{v_B}{v_A}$$

If one medium (say B) is vacuum or air then the constant $n_{AB} = n_A$ is known as the refractive index of medium A. It is defined as the ratio of speed of light in vacuum or air (c) to speed of light in given medium.

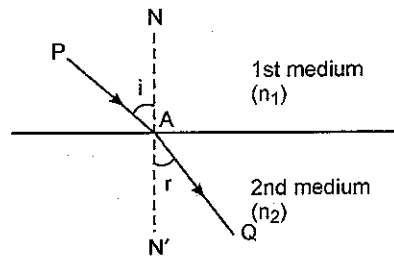
$$\therefore n_A = \frac{c}{v_A}$$

As per question for glass $n_g = \frac{3}{2}$ and for water $n_w = \frac{4}{3}$ and speed of light in glass $v_g = 2 \times 10^8$ m s⁻¹

$$(i) \because n_g = \frac{c}{v_g}, \text{ hence speed of light in vacuum } c = n_g \cdot v_g$$

$$\Rightarrow c = \frac{3}{2} \times 2 \times 10^8 = 3 \times 10^8 \text{ m s}^{-1}$$

$$(ii) \because n_w = \frac{c}{v_w}, \text{ hence speed of light in water } v_w = \frac{c}{n_w}$$



⇒

$$v_w = \frac{3 \times 10^8}{\frac{4}{3}} = 2.25 \times 10^8 \text{ m s}^{-1}$$

Q.21. (a) Why does carbon form compounds mainly by covalent bonding ?

(b) List any two reasons for carbon forming a very large number of compounds.

(c) An organic acid X is a liquid which often freezes during winter time in cold countries, has the formula, $\text{C}_2\text{H}_4\text{O}_2$. On warming with ethanol in the presence of a few drops of concentrated sulphuric acid, a compound Y with a sweet smell is formed.

(i) Identify X and Y.

(ii) Write a chemical equation for the reaction involved. (5)

Ans. (a) Carbon has 4 electrons in its valence shell. To attain stability, it should either gain 4 electrons or lose 4 electrons. It cannot lose 4 electrons as it involves a lot of energy. Also, it cannot gain 4 electrons because the nucleus cannot hold on to the extra electrons added. Therefore to complete the octet, it shares four electrons with other atoms. That is why carbon forms compounds mainly by covalent bonding.

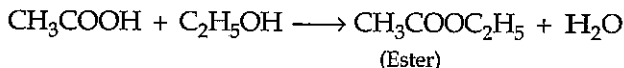
(b) Two reasons for forming a large number of compounds by carbon are :

Catenation : It is the property of carbon to link to other carbon atoms forming straight chain, branched chain and ring compounds.

Tetravalency : Carbon has a valency of four. Also it can link to atoms other than hydrogen, like oxygen, nitrogen and halogens to form a wide variety of compounds.

(c) Compound X is ethanoic acid CH_3COOH . It freezes at 290 K (17 °C), the temperature during winter season. It has the molecular formula $\text{C}_2\text{H}_4\text{O}_2$. On warming with ethanol, it forms ethyl ethanoate having a sweet smell. Thus, Y is ethyl ethanoate ($\text{CH}_3\text{COOC}_2\text{H}_5$).

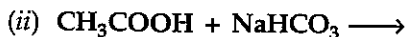
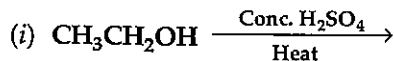
Chemical equation for the reaction is written as under :



(Ester)

Or

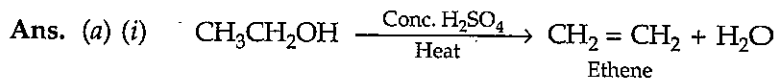
(a) Complete the following equations :



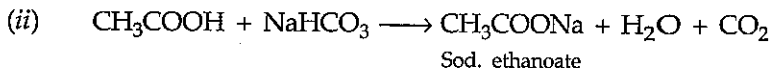
(b) Write the names of the following :



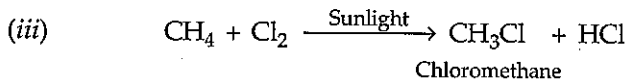
(c) Draw the electron dot structure of ethene (C_2H_4).



Ethene

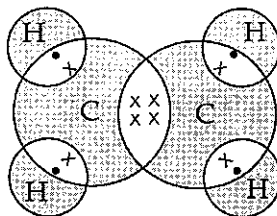


Sod. ethanoate



Chloromethane

- (b) (i) $\text{CH}_3\text{CH}_2\text{COOH}$ Propanoic acid
 (ii) $\text{CH}_3\text{CH}_2\text{Br}$ Bromoethane
 (c) Electron dot structure of ethene (C_2H_4) :



Q.22. Ethanol, commonly called as alcohol is an excellent solvent, is used in medicines and is an important chemical compound involved in synthesis of many chemical compounds. However, in spite of its benefits to man, its impact on social behaviour has always been questioned. Media has often shown abnormal behaviour of people while drunk. It is considered as a curse in the lives of those who are addicted to alcohol – ‘Alcoholic’ people are not only lowering their metabolism and affecting Central Nervous System, they are also a threat to the lives of others. Anger and rude behaviour are some of its ill effects.

(i) Comment on the statement – ‘Should production of alcohol should be banned’, give three valid reasons to justify.

(ii) As a student what initiative would you take in the common concern of ‘Save Life, Do not Drink’. Give two suggestions. [Value Based Question] (5)

Ans. In favour of negative response :

- (i) Regulate production and supply.
- (ii) It is used in so many ways for medicines, ornamentation.
- (iii) It is used as disinfectant.

In favour of positive response :

- (i) Cause of death of many people.
- (ii) Many adolescents get affected out of it and become addict.
- (iii) Is being misused even where it is of important use (for example, painting shops, industries).

Initiatives :

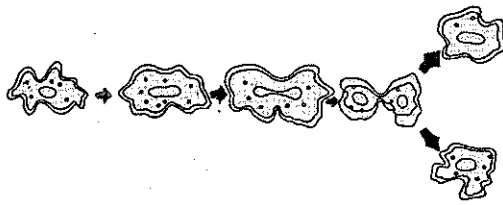
Drive to make aware
 Skit/Role plays/drama
 Article writing
 Chart preparation
 Slogan writing.

Q.23. Describe the process of fission, budding and spore formation in living organism. (5)

Ans. Asexual reproduction occurs in following ways :

(i) **Fission** : It is the process of asexual reproduction in unicellular organisms, such as *amoeba* and *paramecium*. Fission is again of two types :

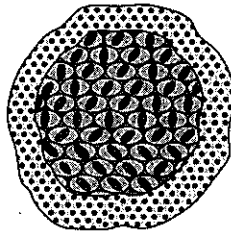
(a) **Binary fission** : During binary fission, the nuclear division takes place first, followed by the appearance of a constriction in the cell membrane, which gradually increases inwards and divides the cytoplasm into two parts. Finally two daughter cells are formed.



Binary fission in *Amoeba*

(b) **Multiple fission** : The type of fission in which not two but several individuals arise, from one individual is called multiple fission.

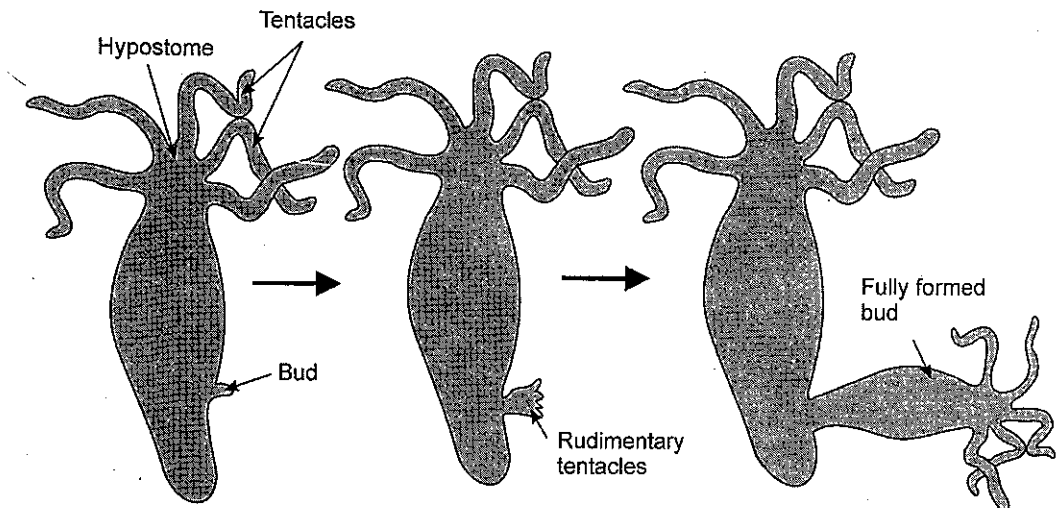
During multiple fission, the nucleus divides several times into many daughter nuclei. The daughter nuclei arrange along the periphery of the parent cell and a bit of cytoplasm accumulates around each daughter nuclei. Finally, the daughter nuclei develops an outer membrane and the multinucleated body divides into as many parts as the number of daughter nuclei and forms daughter individuals.



Multiple fission in *Plasmodium*.

(ii) **Budding** : Budding is seen in both multicellular (*Hydra*) and unicellular organisms (yeast).

In *Hydra*, a bulge in the body appears as a result of repeated mitotic division in the cells. These lateral bulges are called buds. These buds slowly develop into a new *Hydra* and get separated from the parent.

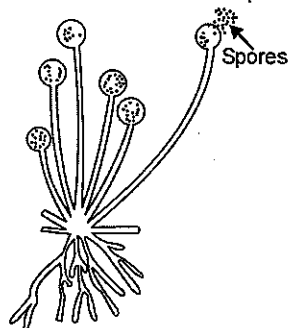


Budding in *Hydra*

In yeast, a small protuberance appears on the upper part of an adult cell. This protuberance grows in size. From this newly budded cell, another bud appears at the tip. This process continues 3 - 4 times, resulting in a chain of yeast cells.

(iii) **Spore formation** : Spore formation is the most common method of asexual reproduction seen in fungi and bacteria. During spore formation, a structure called sporangium develops from the fungal hypha. The nucleus divides several times within the sporangium and each nucleus with a bit of cytoplasm, develops into a spore.

The spores are liberated and they develop into new hypha after reaching the ground. e.g., *Rhizopus*, *Mucor* and *Penicillium*.

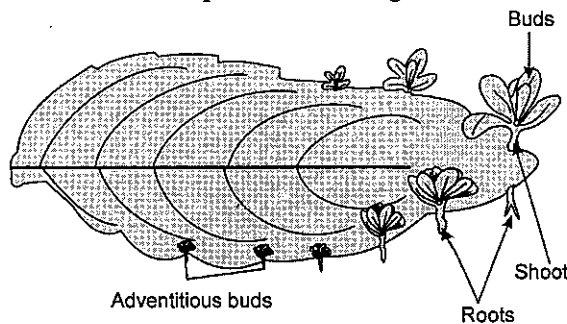


Spore formation in *Rhizopus*

Or

What is meant by vegetative propagation ? Describe its various ways. What is the significance of vegetative propagation ?

Ans. It is a method of reproduction in some higher plants. During vegetative propagation, a new plant develops from vegetative parts of plants such as root, stem or leaf. In some plants, vegetative reproduction is natural e.g., potato (Tuber), onion (Bulb), ginger (Rhizome). In bryophyllum, new plants arise from buds present on margin of leaf.



Leaf of *Bryophyllum* with buds

Three methods of artificial vegetative propagation are :

(1) **Cutting** : A piece of stem, root, leaf when placed partly under moist condition in soil, develops root and gives rise to a new plant. Grape, rose are propagated by using stem cutting.

(2) **Layering** : Layering is done by two ways :

(i) A part of the stem of a plant is pulled and buried in soil, while it is attached and supported by parent plant, soon, the layered branch develops root and is then separated from parent plant.

(ii) In the second type of layering 2 – 3 cm wide notch is made in bark of a branch. The cut surface is covered with moist soil, wrapped with polyethene cover and tied at both ends. Rooting takes place in the cut area within 4 – 8 weeks. The rooted portion is separated from the parent plant and planted. Layering is used for plants like lemon, guava, bougainvillea, jasmine, mogra etc.

(3) **Grafting** : Grafting is a method in which two parts of different plants are joined together in such a way that they unite and grow as one plant. The portion of a plant that is grafted on to the other plant is called scion and the plant in which grafting is performed is called stock. After planting scion in the stock they are tied together in such a way that the cambium of scion comes in contact of cambium of stock. Grafting is done in rose, citrus and mango.

Significance of vegetative propagation :

(i) It is the only means of propagating such plants which do not produce viable seeds or produce very few seeds such as banana, orange, grape, rose and pineapple.

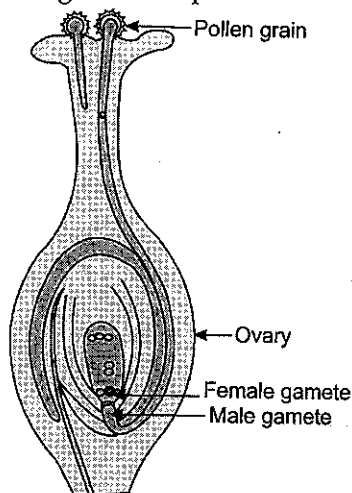
(ii) Many identical plants having same characters can be raised by this method.

Q.24. Define the terms pollination and fertilisation. Draw a diagram of a pistil showing pollen tube growth into the ovule and label the following :

pollen grain, male gamete, female gamete, ovary. (5)

Ans. Pollination is the transfer of pollen grains from the anther of a stamen to the stigma of a carpel. The pollen grains are transferred by many agents, such as insects, birds, man, wind and water.

Fertilisation is defined as the fusion of a male gamete (sperm) with a female gamete (an ovum or egg) to form a zygote during sexual reproduction.



Or

Describe in brief the rôle of (i) testis, (ii) seminal vesicle, (iii) vas deferens, (iv) ureter and (v) prostate gland in human male reproductive system.

Ans. (i) Testes are the oval-shaped primary reproductive organs in man. A pair of testis lies in a small sac-like muscular structure outside the abdominal cavity called scrotum. The function of testis is to produce sperm and male sex hormone called testosterone. The scrotum provides the optimal temperature for formation of sperms.

(ii) **Seminal vesicle** produces an alkaline fluid which provides a liquid medium for sperms and nourishes them.

(iii) **Vas Deferens** : The sperms are carried by a long tube called vas deferens or sperm duct into organs called seminal vesicles, where the sperms get nourished and stored.

(iv) **Ureter** is a common duct for the passage of both urine and spermatic fluid. Urethra carries the sperm to an organ called penis which opens to the outside through a male genital pore.

(v) **Prostate glands** also produce fluid which is released in the urethra along with secretion of seminal vesicle. The secretion of accessory glands together with sperms is called semen.

SECTION B

Q.25. To determine focal length of a concave mirror a student obtains the image of a well lit distant object on a screen. To determine the focal length of the given concave mirror he needs to measure the distance between : (1)

- (a) mirror and the object.
- (b) mirror and the screen.
- (c) screen and the object.
- (d) screen and the object and also mirror and the screen.

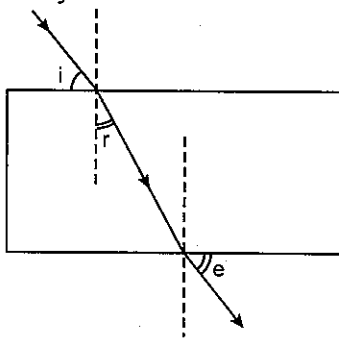
Ans. (b) The student should measure the distance between the mirror and the screen.

Q.26. A student obtained a sharp image of the grills of a window on a screen using a concave mirror. His teacher remarked that for getting better results a well lit distant object (preferably the sun) should be focussed on the screen. What should be done for this purpose ? (1)

- (a) Move the screen slightly away from the mirror.
- (b) Move the mirror slightly towards the screen.
- (c) Move the screen and the mirror away from the object.
- (d) Move the screen and the mirror towards the object.

Ans. (b) If one uses sun as a distant object instead of a window grill, then he should move the mirror slightly towards the screen to obtain a sharp image.

Q.27. A student traces the path of a ray of white light through a rectangular glass slab and marks the angles of incident ($\angle i$), refraction ($\angle r$) and emergence ($\angle e$) as shown. Which angle or angles has he not marked correctly ? (1)



- (a) $\angle i$ only
- (b) $\angle i$ and $\angle r$
- (c) $\angle i$ and $\angle e$
- (d) $\angle r$ and $\angle e$

Ans. (c) The student has not marked $\angle i$ and $\angle e$ correctly.

Q.28. To determine the focal length of a convex lens by obtaining a sharp image of a distant object we generally follow the following steps which are not in proper sequence. (1)

- (A) Hold the lens between the object and the screen.
- (B) Measure the distance between the lens and the screen.
- (C) Select a well lit distant object.
- (D) Place a screen opposite to the object on the lab table.
- (E) Adjust the position of the lens to form a sharp image.

The correct sequence of these steps is :

- (a) C, A, D, E, B
- (b) C, D, A, E, B
- (c) C, D, E, A, B
- (d) C, A, E, D, B

Ans. (b) The correct sequence of the steps is C, D, A, E, B.

Q.29. While tracing the path of a ray of light passing through a rectangular glass slab a student tabulated his observations as given below :

| S.No. | $\angle i$ | $\angle r$ | $\angle e$ |
|-------|------------|------------|------------|
| I | 60° | 40° | 61° |
| II | 50° | 36° | 51° |
| III | 40° | 28° | 39° |
| IV | 30° | 30° | 31° |

The correct observation is :

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

Ans. (d) The correct observation is IV.

Although all the observations appear to be correct but value of refractive index of glass slab

$$\left(n = \frac{\sin i}{\sin r} \right) \text{ comes out to be much smaller. However, for observation IV, } n = \frac{\sin 30^\circ}{\sin 20^\circ} = \frac{0.5000}{0.3420} = 1.46,$$

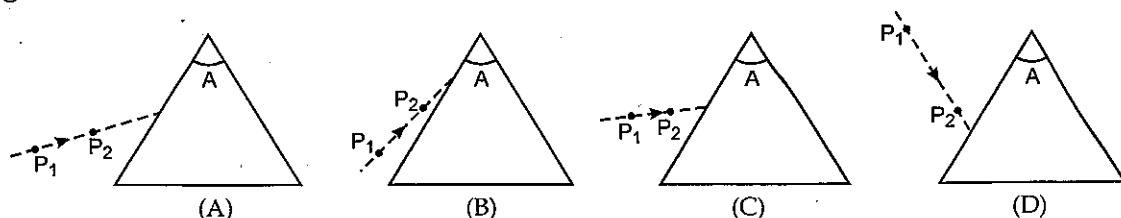
which is almost same as the actual value of glass. Hence, this observation is correct.

Q.30. For a double convex lens an image lies at same distance as the object is from the lens and the image is real and inverted. The object is situated (1)

- (a) at focus point
- (b) between f and $2f$
- (c) at $2f$
- (d) beyond $2f$

Ans. (c) The object is situated at $2f$.

Q.31. Four students, while performing an experiment for drawing the path of light ray through a prism, fixed the pins P_1 and P_2 marking the incident ray as given in the following figure : (1)



The correct arrangement is of student

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

Ans. (a) Arrangement of student A is correct.

Q.32. Which of the following observations is true about dilute solution of acetic acid ? (1)

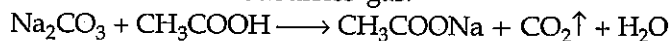
- (a) It smells like vinegar and turns red litmus blue.
- (b) It smells like onion and turns blue litmus red.
- (c) It smells like orange and turns red litmus blue.
- (d) It smells like vinegar and turns blue litmus red.

Ans. (d) Acetic acid smells like vinegar and being acidic, it turns blue litmus red.

Q.33. A student takes Na_2CO_3 powder in a test tube and pours some drops of acetic acid over it. He observes : (1)

- (a) no reaction in the test tube.
- (b) colourless gas with pungent smell.
- (c) bubbles of a colourless and odourless gas.
- (d) white fumes with smell of vinegar.

Ans. (c) Bubbles of a colourless and odourless gas.



Q.34. A student adds 4 mL of acetic acid to a test tube containing 4 mL of distilled water. He then shakes the test tube and leaves it to settle. After about 10 minutes he observes : (1)

- (a) a layer of water over the layer of acetic acid.
- (b) a layer of acetic acid over the layer of water.
- (c) a precipitate settling at the bottom of the test tube.
- (d) a clear colourless solution.

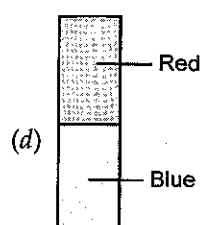
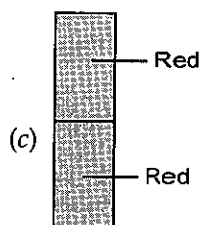
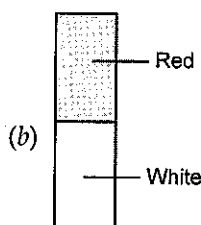
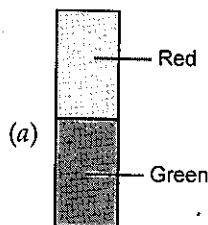
Ans. (d) There is no reaction when acetic acid is added to water. The two are miscible so no layers are formed.

Q.35. To facilitate the precipitation of soap in the saponification experiment, we add (1)

- (a) water
- (b) acetic acid
- (c) hydrochloric acid
- (d) sodium chloride solution

Ans. (d) Sodium chloride brings about the precipitation of soap due to common-ion effect.

Q.36. A red litmus paper was half dipped in the mixture after the saponification reaction was complete. Which of the following observations is correct ? (1)



Ans. (d) The solution becomes alkaline after the saponification reaction. Hence the red litmus paper becomes blue.

Q.37. When we add soap to hard water, we observe that (1)

- (a) soap does not react.
- (b) soap disappears immediately.
- (c) a scum is formed which floats on the surface of water.
- (d) none of the above happens.

Ans. (c) A scum (calcium or magnesium stearate) is formed when soap is added to hard water and floats on the surface of hard water.

Q.38. A student has to observe a permanent slide of binary fission in amoeba. Find the correct sequence of steps given below for focussing the object under a microscope. (1)

(i) Place the slide on the stage, look through the eye-piece and adjust the mirror to get proper illumination.

(ii) Focus the slide sharp using fine adjustment screw.

(iii) Look through the eye-piece and raise the objective lense using coarse adjustment screw till the object is focussed.

(iv) Look through the eye-piece and move the slide till the object is visible.

(a) (iv), (iii), (ii), (i)

(b) (i), (ii), (iv), (iii)

(c) (i), (iv), (iii), (ii)

(d) (i), (iii), (iv), (ii)

Ans. (c) This is the correct sequence.

Q.39. After viewing different slides, a student draws following diagrams. Select the one which depicts binary fission in amoeba. (1)



(A)



(B)



(C)



(D)

(a) A

(b) B

(c) C

(d) D

Ans. (c)

Q.40. After observing the prepared slides of binary fission in amoeba and budding in yeast following observations were reported : (1)

(A) Single cells of amoeba and yeast were undergoing binary fission and budding respectively.

(B) Cytokinesis was observed in the yeast cell.

(C) Elongated nucleus was dividing to form two daughter nuclei in amoeba.

(D) A chain of buds were observed due to reproduction in amoeba.

The correct observation(s) is/are :

(a) A and C

(b) B only

(c) C and D

(d) D, A and C

Ans. (c) **Reason :** In amoeba the nucleus elongates before fission and in yeast a chain of buds is formed.

Q.41. Which organ of the embryo in dicot seeds generally stores the food ? (1)

(a) Radicle

(b) Cotyledons

(c) Plumule

(d) Endosperms

Ans. (b) This is the correct answer.

Q.42. Which pair out of the following are homologous organs ? (1)

(a) Tendril of pea plant and tendril of cucumber plant.

(b) Potato and sweet potato.

(c) Wing of bird and wing of insect.

(d) Potato and tendril of cucumber plant.

Ans. (d) Both are modifications of stem.