

Sample Question Paper

Fully Solved (Question-Solution)

SCIENCE

A Highly Simulated Practice Question Paper for CBSE Class X
Term II Examination (SA II)

Time : 3 Hours

Max. Marks : 90

General Instructions

- The question paper comprises of two sections A and B. You are to attempt both the sections. All questions are compulsory.
- All questions of section A and all questions of section B are to be attempted separately.
- Question numbers 1 to 3 in section A are 1 mark questions. These are to be answered in one word or one sentence.
- Question numbers 4 to 7 are 2 marks questions to be answered in about 30 words.
- Question numbers 8 to 19 are 3 marks questions to be answered in about 50 words.
- Question numbers 20 to 24 are 5 marks questions to be answered in about 70 words.
- In section B, question numbers 25 to 42 are multiple choice questions based on practical skills. Each question is a 1 mark question. You are to select one most appropriate response out of the four provided to you.

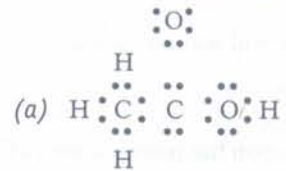
Section A

Q1. Name the phenomena of light, that are involved in the formation of a rainbow.

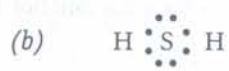
Sol. The phenomena of light, that are involved in the formation of a rainbow are refraction, dispersion and total internal reflection. ①

Q2. Draw the electron dot structure of
(a) ethanoic acid (b) hydrogen sulphide

Sol. Electron dot structures of ethanoic acid and hydrogen sulphide are as follows



Ethanoic acid (CH₃COOH)



Hydrogen sulphide (H₂S)

1/2 x 2

Q3. How would you dispose the domestic wastes like vegetable peels?

Sol. Domestic wastes like vegetable peels can be disposed off by composting, i.e., by burying the domestic waste in a deep pit and covering it with a thick layer of soil. ①

STAGE I

Q4. A convex lens of focal length 20 cm can produce a magnified, virtual as well as real image. Is this a correct statement? If yes, where shall the object be placed in each case for obtaining these images?

Sol. Yes, it is correct statement. A convex lens of focal length 20 cm can produce a magnified, virtual as well as real image. ①

The object should be placed

- (i) between focus F_1 and optical centre O , i.e., at a distance less than 20 cm from the lens for magnified, virtual and erect image.
- (ii) between F_1 and $2F_1$, i.e., at a distance between 20 cm to 40 cm for real, inverted and enlarged image. ①×2

Q5. The following table lists a few functions/phrases/statements in column A. Match these items in column A to the corresponding terms in column B. Note that more than one item in column A may match with the same item in column B.

Column A		Column B	
A ₁	Corrected by using bifocal lenses.	B ₁	Hypermetropia
A ₂	Cells on this part generate electrical signals.	B ₂	Presbyopia
A ₃	Near-sightedness	B ₃	Retina
A ₄	Corrected by using convex lenses.	B ₄	Myopia
A ₅	Far-sightedness		

Sol. (A₁ → B₂), (A₂ → B₃), (A₃ → B₄), (A₄ → B₁), (A₅ → B₁)

- Hypermetropia (far-sightedness—the image of nearby object is focussed beyond the retina) is corrected by using a convex lens of suitable power.
- The main vision disorder for which bifocal lenses are used, is presbyopia—a condition that happens as the age increases and it affects our ability to focus on objects that are near.
- The part of the eye that responds to light by generating a small electrical signal, is the retina.
- A person suffering from myopia or near-sightedness, can see nearby objects clearly but cannot see the far away objects clearly. ②

Q6. The water in deep sea appears blue. Explain why?

Sol. The blue colour of water in deep sea is due to the scattering of light by very fine particles. The very fine particles scatter mainly blue light (of smaller wavelength). The colour of the scattered light depends on the size of the scattering particles. ②

Q7. Which of the following elements have smaller atomic size?

- (a) $_{11}\text{Na}$ or $_{19}\text{K}$
- (b) $_{5}\text{B}$ or $_{6}\text{C}$
- (c) $_{11}\text{Na}$ or $_{12}\text{Mg}$
- (d) $_{9}\text{L}$ or $_{17}\text{Cl}$

Sol. (a) $_{11}\text{Na} = 2, 8, 1$ and $_{19}\text{K} = 2, 8, 8, 1$

Sodium and potassium are the elements of same group and sodium has less number of shells. Therefore, sodium has smaller atomic size.

(b) $_{5}\text{B} = 2, 3$ and $_{6}\text{C} = 2, 4$

Boron and carbon are the elements of same period and carbon has more number of valence electrons. Therefore, carbon has smaller size.

(c) $_{11}\text{Na} = 2, 8, 1$ and $_{12}\text{Mg} = 2, 8, 2$

Sodium and magnesium are the elements of same period and Mg has more number of valence electrons. Therefore, magnesium has smaller size.

(d) ${}_9F = 2, 7$ and ${}_{17}Cl = 2, 8, 7$

Fluorine and chlorine are elements of same group and fluorine contains less number of shells. Therefore, fluorine has smaller size. (1/2 × 4)

Q8. Harish and his friends were excited about the news of tomorrow's solar eclipse. Harish convinced his friends to witness the eclipse. Harish told them that looking at the sun directly or even into a mirror reflecting sunlight, may damage their eyes. So, Harish narrated the method to witness to natural phenomenon in the following ways

- (i) Hold a concave mirror in hands and direct its reflecting surface towards the sun.
- (ii) Direct the light reflected by the mirror on to a sheet of paper held close to the mirror.
- (iii) Move the sheet of paper back and forth gradually until a bright, sharp spot of light is found on the paper sheet, hold the mirror and the paper in the same position for a few minutes.

Read the above information and answer the following questions

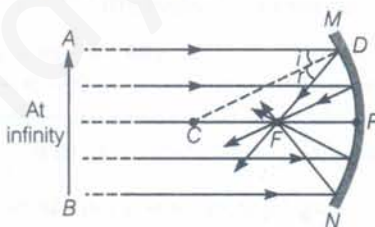
- (a) What is the separation between the concave mirror and the paper sheet having a bright, sharp spot of light in hands?
- (b) What value(s) is/are shown by Harish?
- (c) Draw the ray diagram used while observing the bright, sharp spot of light in above activity.

Sol. (a) Here, the rays coming from the sun are coming parallel to the principal axis of the concave mirror, so it will focus the image on its principal focus. Hence, the separation between the concave mirror and the paper sheet will be equal to the focal length of the concave mirror.

(b) Values shown by Harish are

- (i) Togetherness (ii) Friendship (iii) Positive attitude

(c) Necessary ray diagram is shown below



(1 × 3)

- Q9.** (a) How are power and focal length of a lens related?
 (b) You are provided with two lenses of focal length 20 cm and 40 cm respectively. What lens will you use to obtain more convergent light?

Sol. (a) The degree of convergence or divergence of light rays achieved by a lens is expressed in terms of its power. The power P of a lens of focal length f (in metre) is given by, $P = \frac{1}{f}$. (1)

(b) The unit of power of lens is dioptre (D), provided focal length is measured in metres. For greater convergent light, lens of higher power and smaller focal length is needed, i.e., the lens of focal length 20 cm is needed for the same. (2)

Q10. A person needs a lens of power -4.5 D for correction of his vision.

- (a) What kind of defect in vision is the having?
- (b) What is the focal length of the corrective lens?

Sol. (a) The person is suffering from myopia or near-sightedness as he wears concave lens for correction. (1)

(b) Since, focal length $f = \frac{1}{P} = \frac{1}{-4.5} = -0.222 \text{ m} = -22.2 \text{ cm}.$

The focal length of the corrective concave lens is 22.2 cm. (2)

Q 11. The valency of silicon is 4 and that of chlorine is 1. Why?

Sol. Electronic configuration of silicon is 2, 8, 4. Silicon needs 4 more electrons to attain the electronic configuration of the nearest noble gas, argon. Therefore, silicon is tetravalent. (1/2 x 2)

Electronic configuration of chlorine is 2, 8, 7. Chlorine needs 1 more electron to attain the electronic configuration of the nearest noble gas, argon. Thus, chlorine is monovalent. (1/2 x 2)

Q 12. What is meant by speciation? List any four factors which could lead to the formation of new species.

Sol. The process by which new species develop from the existing species is known as speciation. (1)

Factors which could lead to speciation are

- (i) Geographical isolation of population by various types of barriers like mountains, rivers, etc.
- (ii) Genetic drift caused by drastic changes in the frequency of particular gene by chance.
- (iii) Variations caused in individual due to natural selection.
- (iv) Origin of new species. (1/2 x 4)

Q 13. Following are the elements of second period of the Periodic Table.

Li Be B C N O F

- (a) Give reasons to explain why atomic radii decreases from Li to F ?
- (b) Identify the most
 - (i) metallic element
 - (ii) non-metallic element

Sol. (a) On moving from left to right in a period of the Periodic Table, nuclear charge increases but the number of shells remains the same. Due to this, electrons of the outermost shell are pulled closer to the nucleus, this results in decrease in the size of the atom. That's why atomic radii decreases from Li to F. (1/2 x 2)

(b) On moving from left to right in a period of the Periodic Table, metallic character decreases but non-metallic character increases. (1/2)

- Therefore,
- (i) lithium is the most metallic element.
 - (ii) fluorine is the most non-metallic element. (1/2 x 3)

Q 14. What will happen if we kill all the organisms of one trophic level?

Sol. If all the organisms of one trophic level are killed, the transfer of energy and matter to the next higher trophic level will stop. This will lead to overpopulation of a lower trophic level, causing competition among themselves. Thus, the food chain will be disturbed. (3)

- Q 15.** (a) What is 'Chipko Andolan'?
- (b) What was the result of 'Chipko Andolan'?

Sol. (a) 'Chipko Andolan' or 'Hug the Trees Movement' was started by women of Reni village, Garhwal, Uttarakhand to stop contractors from felling down trees of their forests. Sunder Lal Bahuguna was the prominent leader of this movement. (1/2)

(b) Results of 'Chipko Andolan' were

- (i) The quality of environment was maintained due to conservation of forest and wildlife.
- (ii) The local people could use the forest reserves in a sustainable way. (1½)

Q16. What happens to the lining of uterus

- (a) before the release of a fertilised egg?
- (b) if no fertilisation occurs?

Sol. (a) There is repair and growth of endometrium followed by its thickening and development of glands. (1½)

(b) Breakdown of endometrium lining and rupturing of its blood vessels occurs, producing menstrual flow. (1½)

Q17. What is vegetative propagation? List two advantages of vegetative propagation.

Sol. In vegetative propagation, a new plant can be grown from vegetative buds such as root, stem and leaves. (1)

Two advantages of vegetative propagation are

- (i) It is the only means of propagating plants which do not produce seeds, such as banana, orange, rose, etc.
- (ii) Identical plants having same characters can be raised by this method. (1×2)

Q18. A village recorded highest cases of atrocities against women. The health officer of the village organised a skit to convey the fact that women should not be punished for giving birth to a girl child. They should be given due respect in society. The villagers were greatly motivated.

Read the above passage and answer the following questions

- (a) What are the methods of sex determination in humans?
- (b) What are the sex chromosomes in males?
- (c) What values was the officer trying to highlight through the skit?

Sol. (a) Ultrasound, Amniocentesis and Chorionic Villus Sampling (CVS) are the methods of sex determination in humans. (1)

(b) XY are the sex chromosomes in males. (1)

(c) The officer is trying to highlight the social responsibility and concern for women through the skit. (1)

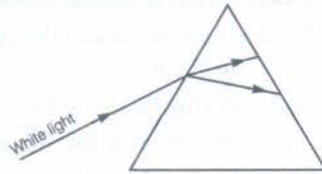
Q19. Differentiate between inherited and acquired trait. Give one example for each.

Sol. The differences between inherited and acquired trait are

S.No.	Inherited Trait	Acquired Trait
(i)	A trait which is caused by a change in its genes is called an inherited trait.	A trait which is not inherited, but developed in response to the environment is called an acquired trait.
(ii)	This trait is passed onto its future generations.	This trait cannot be passed onto its future generations.
(iii)	Example, coat colour of a pig.	Example, cut tail of a mouse.

(1×3)

Q20. Study the diagram given below carefully and answer the questions that follow



- Complete the above diagram indicating the names of the emerging colours in correct sequence.
- Name the phenomenon involved.
- Give an example of the phenomenon occurring in (i) daily life (ii) nature.
- Name the colour which deviates the (i) most (ii) least.
- Explain a method to recombine the separated colours to get back white light.

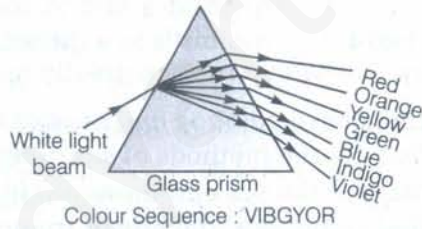
or

Draw a ray diagram showing the image formation by a concave mirror when an object is placed

- between pole and focus of the mirror.
- between focus and centre of curvature of the mirror.
- a little beyond the centre of curvature of the mirror.

Also describe the nature of image when concave mirror is replaced by convex mirror in case (c).

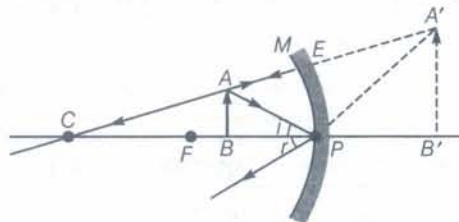
Sol. (a)



- The name of phenomenon involved is dispersion of light. ①
- Example of the phenomenon occurring
 - in daily life is dispersion of light into its seven constituent colours by a prism. ①
 - in nature is rainbow. ①/2 × 2
- The colour which deviates the
 - most is violet. ①/2 × 2
 - least is red. ①/2 × 2
- The method to recombine the separated colours to get back the white light is to place a second identical prism in an inverted position with respect to the first prism. ①

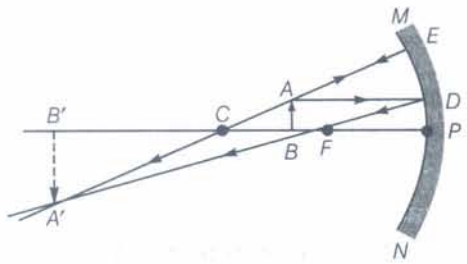
or

- The enlarged, virtual and erect image of the object is formed behind the mirror.



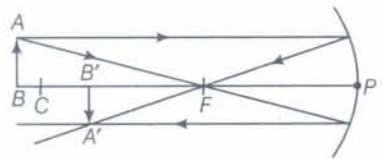
①/2

(b) The enlarged, real and inverted image of the object is formed beyond the centre of curvature.



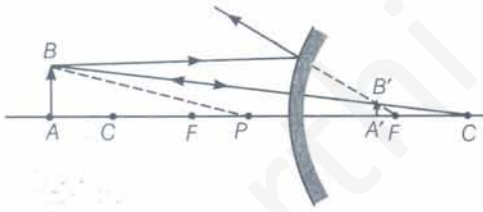
(1½)

(c) The diminished, real and inverted image of the object is formed between centre of curvature and F.



(1)

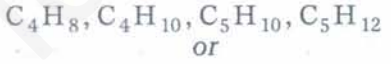
When concave mirror is replaced by convex mirror in case (c), the diminished, virtual and erect image of the object is formed behind the mirror.



(1)

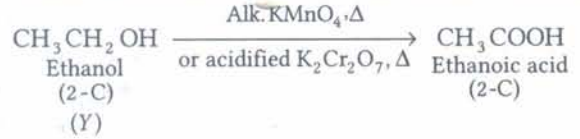
Q21. (a) A compound (X) is formed by the reaction of carboxylic acid having the molecular formula $C_2H_4O_2$ and alcohol (Y) in the presence of conc. H_2SO_4 . The same carboxylic acid is obtained by the oxidation of alcohol (Y). Name the compounds (X) and (Y). Give the chemical equation for the reaction.

(b) Which of the following compounds give substitution reactions and why?



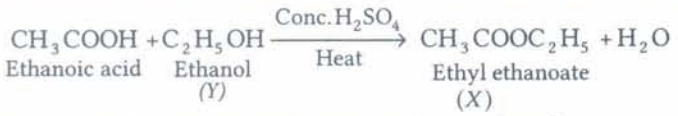
- (a) Which hydrocarbons burn with
 - (i) non-sooty blue flame and
 - (ii) sooty yellow flame?
- (b) What happens when methane reacts with chlorine?
- (c) What is rectified spirit?
- (d) Why does soap not work in hard water?
- (e) What is glacial acetic acid?

Sol. (a) Alcohols on oxidation with alkaline $KMnO_4$ or acidified $K_2Cr_2O_7$ give acids. Carboxylic acid ($C_2H_4O_2$) contains 2-carbon atoms, therefore, alcohol (Y) should also contain 2-carbon atoms. So, it is ethanol and the carboxylic acid is ethanoic acid.



(1)

The carboxylic acid and alcohol in presence of conc. H_2SO_4 react to produce ester (X).



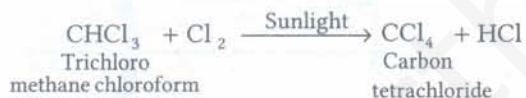
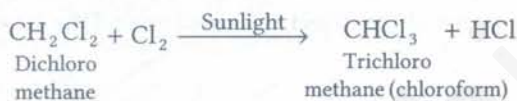
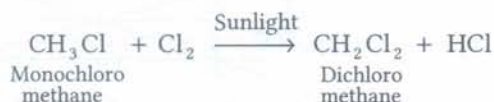
So, compound X is ethyl ethanoate and compound Y is ethanol.

(1+1)

- (b) Alkanes give substitution reaction. General formula for alkanes is C_nH_{2n+2} .
Butane (C_4H_{10}) and pentane (C_5H_{12}) correspond to the general formula of alkanes. These are saturated hydrocarbons and undergo substitution reaction which is their characteristic property. (1×2)

or

- (a) (i) Saturated hydrocarbons generally burn with a non-sooty blue flame.
(ii) Unsaturated carbon compounds burn with sooty yellow flame. (1/2×2)
- (b) In the presence of sunlight, chlorine reacts with methane. It can replace the hydrogen atoms by one (substitution reaction).



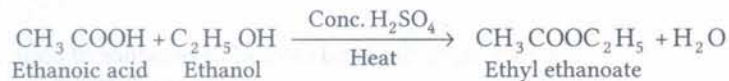
- (c) An aqueous solution of ethanol containing 95% ethanol and 5% water is called rectified spirit. (1/2)
- (d) Hard water contains Ca^{2+} and Mg^{2+} ions. Soap reacts with these ions of hard water and forms scum (precipitate) of insoluble calcium salt and magnesium salt. Scum sticks to the clothes. That's why soap does not produce lather or foam with hard water. (1)
- (e) Pure acetic acid is called glacial acetic acid. (1/2)

- Q22.** (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?

or

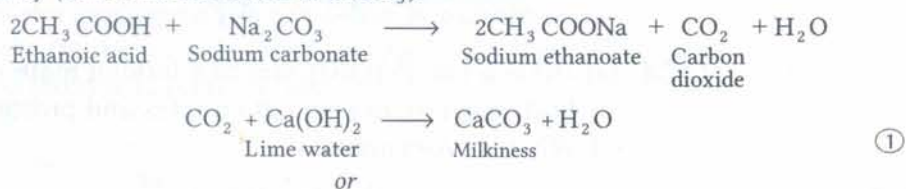
- (a) What is hydrogenation? Give one reaction. What is its industrial application?
(b) What is esterification?

- Sol.** (a) Compound CH_3COOH is ethanoic acid (acetic acid). Its functional group is $-\text{COOH}$ (carboxylic group). (1)
- (b) **Test for ethanoic acid** The given organic compound is warmed with ethanol in the presence of conc. H_2SO_4 . Generation of fruity smell (sweet smell) shows the presence of ethanoic acid (ester test).

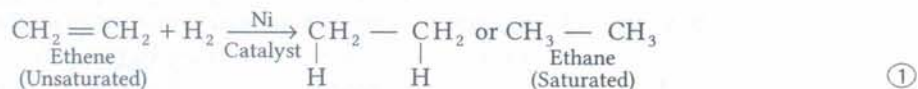


- (c) When ethanoic acid reacts with solid sodium carbonate, CO_2 gas is evolved with brisk effervescence. (1)

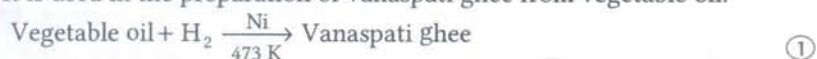
On passing the gas through freshly prepared lime water taken in the test tube, lime water turns milky (due to the formation of CaCO_3).



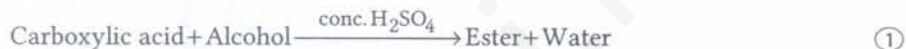
- (a) When unsaturated hydrocarbons react with hydrogen in the presence of a catalyst like nickel, the hydrogen gets added across the double/triple bond and saturated hydrocarbons are formed. Such reaction is called hydrogenation. ②



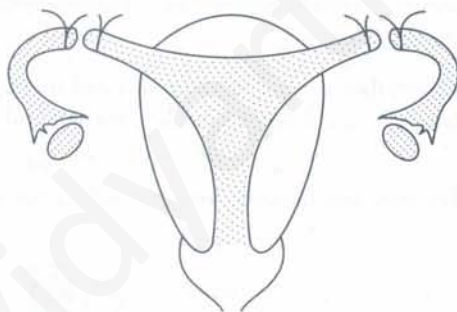
Industrial use It is used in the preparation of vanaspati ghee from vegetable oil.



- (b) When carboxylic acid reacts with alcohol in the presence of conc. H_2SO_4 , ester is formed. This is called esterification.



Q23. (a) What does the following diagram depict?



- (b) What is the full form of IUCD? What is its use? Give one example.

or

- (a) How does reproduction help in providing stability to populations of species?
 (b) Do genetic combination of mother plays a significant role in determining the sex of a newborn?

Sol. (a) The diagram depicts tubectomy or cutting and ligating the oviducts of a woman. It is a permanent surgical method of contraception in human female. ②

- (b) IUCD stands for Intrauterine Contraceptive Device.

It is an emergency contraception, which is placed inside the uterus of a woman by a qualified and trained medical doctor or nurse. e.g., copper-T. ③

or

- (a) Reproduction leads to certain variations in the characteristics of the offspring. This may allow organism to exist in diverse habitats and niches. Certain variations present in the individuals of certain population may enable the individuals to survive in those unfavourable conditions. Organism with such favourable traits transmit the characters to their offsprings, thereby providing stability to the population of a species. ②
- (b) In humans, sex of a newborn is genetically determined. This is because, in sexual reproduction, fusion of sperm (XY) and ovum (XX) is an essential event. Both male and female child require one X-chromosome from their mother.

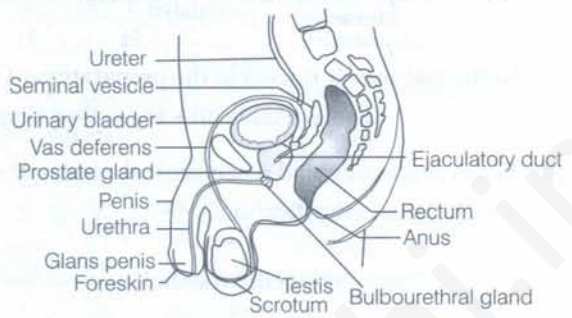
Birth of a child (either boy or a girl) depends on the fact that which of the chromosome either X or Y will fuse with the X-chromosome of a mother. Hence, the genetic combination of mother also play a significant role in sex determination. ③

- Q24** (a) Draw a labelled diagram of a human male reproductive system.
 (b) State the role of seminal vesicles and prostate gland.
 (c) What is vasectomy?

or

- (a) Draw longitudinal section of a flower.
 (b) Give difference between gamete and zygote. Explain their role in sexual reproduction.

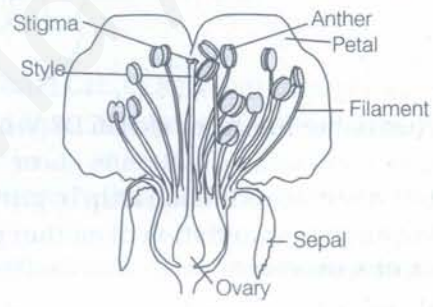
Sol. (a) The diagram showing human male reproductive system is given below



- (b) Seminal vesicles and prostate glands add their secretion to the vas deferens which releases sperms from the testes. The secretions provide nutrition to the sperm and also make their transport easy. ①
1/2
- (c) Vasectomy is a permanent surgical method of contraception in human males where vas deferens is cut and its end are turned and tied to prevent transfer of sperm. ①
1/2

or

(a) The diagram showing longitudinal section of a flower is given below



(b) The differences between gamete and zygote are

S.No.	Gamete	Zygote
(i)	It is a sex or germ cell, which takes part in fertilisation.	It is a product of fertilisation.
(ii)	They are of two types male and female.	It is of one type.
(iii)	It has haploid number of chromosome.	It has diploid number of chromosome.
(iv)	It carries characteristics of only one parent.	It carries characteristics of both the parents.
(v)	It is the last cell of the generation.	It is the first cell of the new generation.

Role of Gametes Fusion of male and female gamete produces a zygote.
Role of Zygote Zygote develops into an embryo and later into an individual. ①
1/2

Section B

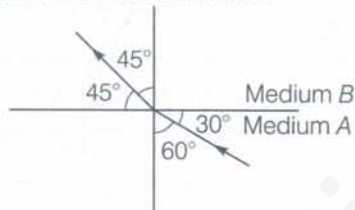
- Q25.** A ray of light falling on a convex lens after passing through focus of lens
- I. becomes parallel to principal axis of lens
 - II. diverges
 - III. remains undeviated
 - IV. converges

The correct options are

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

Sol. (a) A ray on refraction through convex lens becomes parallel to the principal axis of lens.

- Q26.** Figure shows a ray of light as it travels from medium A to medium B. Refractive index of medium B relative to medium A is



- (a) $\frac{\sqrt{3}}{\sqrt{2}}$ (b) $\frac{2}{3}$ (c) $\frac{1}{\sqrt{2}}$ (d) $\sqrt{2}$

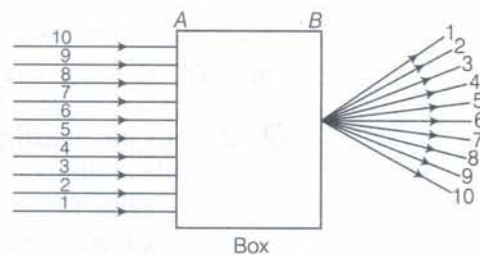
Sol. (a) Here, angle of incidence, $i = 60^\circ$,

Angle of refraction, $r = 45^\circ$

Refractive index of the medium B relative to medium A,

$$n = \frac{\sin i}{\sin r} = \frac{\sin 60^\circ}{\sin 45^\circ} = \frac{\left(\frac{\sqrt{3}}{2}\right)}{\left(\frac{1}{\sqrt{2}}\right)} = \frac{\sqrt{3} \cdot \sqrt{2}}{2} = \frac{\sqrt{3}}{\sqrt{2}}$$

- Q27.** A beam of light is incident through the holes on side A and emerges out of the holes on the other face of the box i.e., B as shown in the figure. Which of the following could be inside the box?

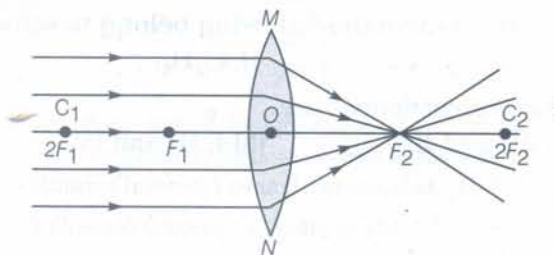


- I. Concave lens
- II. Converging lens
- III. Diverging lens
- IV. Convex lens

The correct options are

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

Sol. (d) Convex lens is also known as converging lens, as it converges all incident rays parallel to principal axis, after refraction, at principal focus.

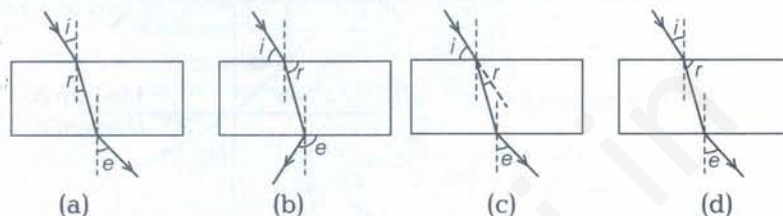


Q28. A student sitting on the last bench, can read the letters written on the blackboard but is not able to read the letters written in his text book. Which of the following statements regarding the above condition is correct?

- (a) The near point of his eyes has receded away.
- (b) The near point of his eyes has come closer to him.
- (c) The far point of his eyes has come closer to him.
- (d) The far point of his eyes has receded away.

Sol. (a) A person with hypermetropia or far-sightedness can see distant objects clearly but cannot see nearby objects distinctly. The near point of his eyes has receded away from the normal near point (25 cm).

Q29. In an experiment to trace the path of a ray of light passing through a rectangular glass slab, the correct measurement of angles of incidence (i), refraction (r) and emergence (e) is shown in diagram below. Choose the correct option.



Sol. (a) All the three angles shown as in diagram (a) have to be measured with respect to the normal drawn at the points of incidence/emergence.

Q30. Which of the following constitutes a food chain?

- (a) Grass, wheat and mango
- (b) Grass, goat and human
- (c) Goat, cow and elephant
- (d) Grass, fish and goat

Sol. (b) Goat being a herbivore eats grass and the human, being an omnivore eats meat of goat.

Q31. Carbon exists in atmosphere in the form of

- (a) coal
- (b) carbon dioxide only
- (c) carbon monoxide only
- (d) CO in traces and CO_2

Sol. (d) Carbon exists in atmosphere in the form of CO in traces and CO_2 .

Q32. Oils on treating with hydrogen in the presence of nickel as catalyst form fats. This is an example of

- I. substitution reaction
- II. hydrogenation
- III. addition reaction
- IV. dehydrogenation

The correct options are

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

Sol. (b) Vegetable oils generally have long unsaturated carbon chains (unsaturated hydrocarbons). These add hydrogen in the presence of catalyst such as nickel (*i.e.*, undergo addition reaction). Addition of hydrogen is also known as hydrogenation.

Q33. Which one of the following belong to same homologous series?

- I. C_2H_4
- II. C_2H_6
- III. C_3H_6
- IV. C_4H_8

The correct options are

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

Sol. (b) C_2H_6 belongs to alkanes (general formula $\text{C}_n\text{H}_{2n+2}$) while C_2H_4 , C_3H_6 and C_4H_8 are the members of alkenes (general formula C_nH_{2n}).

- Q34.** Vinegar is a solution of
 (a) 5 to 8% acetic acid in water (b) 5 to 8% acetic acid in alcohol
 (c) 5 to 8% acetic acid in benzene (d) 5 to 8% acetic acid in ether

Sol. (a) A solution of 5 to 8% acetic acid in water is known as vinegar.

- Q35.** Which of the following will decolourise bromine water?
 I. Propyne II. Propene
 III. Ethene IV. Propane

The correct options are

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

Sol. (c) Propane is a saturated hydrocarbon. It does not decolourise bromine water while ethene, propene and propyne are examples of unsaturated hydrocarbons so they decolourise bromine water.

- Q36.** Consider the following statements about butanoic acid.

- I. It contains —COOH group.
 II. It is a three carbon compounds.
 III. It is a mineral acid.
 IV. It is a weak acid.

The correct statements are

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

Sol. (a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ is butanoic acid. It contains —COOH group, i.e., carboxylic acid group as a functional group.

- Q37.** In the given diagram, (A) acts as



- (a) Bud (b) Chain of buds
 (c) Yeast cell (d) Parent cell

Sol (b) Chain of buds

- Q38.** The given figures illustrate binary fission in *Amoeba*.



The correct order is

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

Sol. (c) The above figures show binary fission which occurs in unicellular organisms (*Amoeba*). Nucleus divides first and later cytoplasm divides to form two cells.

Q39. Which of the following are not Sexually Transmitted Diseases (STDs)?

- | | |
|-----------------|--------------|
| I. Typhoid | II. AIDS |
| III. Gonorrhoea | IV. Cataract |

The correct option (s) is/are

- | | |
|----------------|---------------|
| (a) Only I | (b) II and IV |
| (c) II and III | (d) I and II |

Sol. (d) STDs occur in reproductive organs of males and females. Thus, typhoid and cataract are the diseases which are not related to reproductive organs.

Q40. Which of the following is not an agent of cross-pollination?

- | | |
|-------------|--------------|
| (a) Wind | (b) Water |
| (c) Insects | (d) Sunlight |

Sol. (d) Sunlight is not the agent of cross-pollination, rest others *i.e.*, water, wind and insects are the agents of cross-pollination.

Q41. In sexually reproducing animals, meiosis takes place at the time of

- | | |
|----------------------|-------------------|
| (a) birth | (b) growth |
| (c) gamete formation | (d) fertilisation |

Sol. (c) Meiosis is a type of cell division, which occurs once in the life of all sexually reproducing organisms. Thus, in animals, it occurs only at the time of gamete formation.

Q42. In human males, all the chromosomes are paired perfectly except one. This/these unpaired chromosomes is/are

- I. large chromosome
- II. small chromosome
- III. Y-chromosome
- IV. X-chromosome

The correct option (s) is/are

- | | |
|----------------|---------------|
| (a) I and II | (b) Only III |
| (c) III and IV | (d) II and IV |

Sol. (c) XY (male sex chromosome)