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

1. The question paper comprises of two sections A and B. You are to attempt both the sections. All questions are compulsory.
2. All questions of section A and all questions of section B are to be attempted separately.
3. Question numbers 1 to 3 in section A are 1 mark questions. These are to be answered in one word or one sentence.
4. Question numbers 4 to 7 are 2 marks questions to be answered in about 30 words.
5. Question numbers 8 to 19 are 3 marks questions to be answered in about 50 words.
6. Question numbers 20 to 24 are 5 marks questions to be answered in about 70 words.
7. 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. Under what condition convergent lens produces virtual and erect image?

Sol. When object is placed between optical centre and focus of convergent (convex) lens. ①

Q2. What would be the electron dot structure of a molecule of sulphur, which is made up of eight atoms of sulphur?

Sol. S_8 molecule has a ring structure in which each sulphur atom is joined to two other sulphur atoms by single bonds.
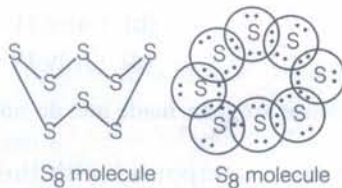
S_8 molecule S_8 molecule   (1/2)
(1/2)

Q3. What are the two major benefits of dams?

Sol. The two major benefits of dams are
(i) Irrigation   (ii) Electricity production $(\frac{1}{2}\times2)$

Q 4. Name the mirror used to get powerful parallel beams of light. Write three more uses of this mirror.

**Sol.** Concave mirror is used to get powerful parallel beams of light. (1/2)

Other uses of this mirror are

(i) In torches, search-lights and vehicle headlights.

(ii) Dentists use concave mirrors to see large images of the teeth of patients.

(iii) Large concave mirrors are used to concentrate sunlight in solar furnaces. ($\frac{1}{2}$×3)

Q 5. Draw the labelled ray diagram showing refraction of light through a triangular glass prism.

Sol. *Labelled ray diagram for refraction of light through a triangular glass prism is shown in figure*

PE = Incident ray	$\angle i$ = Angle of incidence
EF = Refracted ray	$\angle r$ = Angle of refraction
FS = Emergent ray	$\angle e$ = Angle of emergence
$\angle A$ = Angle of the prism	$\angle D$ = Angle of deviation

(2)
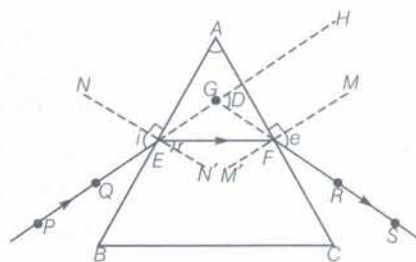
Q 6. Name the phenomenon responsible for natural spectrum in the sky. How is it caused?

Sol. Rainbow is the natural spectrum in the sky. It is caused by dispersion of sunlight by tiny water droplets, present in the atmosphere. ①

Water droplets refract, disperse the incident sunlight, then reflect it internally that causes different colours reaching the observer's eye. ①

Q 7. (a) Besides gallium, which other elements have since, been discovered that were left by Mendeleev in his Periodic Table?

(b) Select the Dobereiner's triads from the following elements.

Li, K, Cl, Ca, Br, Ba, Sr, I, Na

Sol. (a) Scandium (Sc) and germanium (Ge) are the elements that were discovered later and gaps were left for them by Mendeleev. ①

(b) There are three Dobereiner's triads. *These are*

(i) Li, Na, K,   (ii) Ca, Sr, Ba,   (iii) Cl, Br, I ①

Q 8. Name the spherical mirror which always forms diminished, virtual and erect image corresponding to all positions of real object. Draw a neat ray diagram showing image formation when object lies between pole and infinity of this mirror.

Sol. The mirror which always forms diminished, virtual and erect image is convex. ①

Ray diagram is shown in figure below

(2)
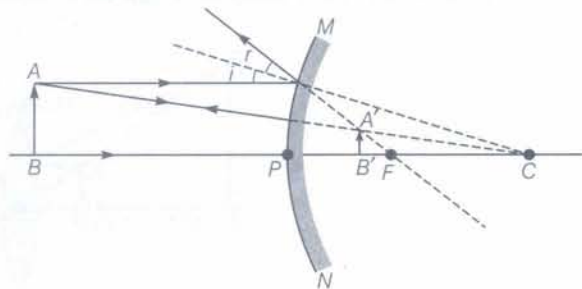
Q9. Size of image of an object formed by a mirror having a focal length of 20 cm is observed to be reduced to 1/3rd of its size. At what distance the object has been placed from the mirror? What is the nature of the image and the mirror?

Sol. Here, considering the case for both types of possible spherical mirrors.

For concave mirror,

Focal length $(f) = -20$ cm, magnification $(m) = -\dfrac{1}{3}$

Since, magnification $(m) = -\dfrac{v}{u}$

Magnification $(m) = -\dfrac{1}{3} = -\dfrac{v}{u} \Rightarrow v = \dfrac{u}{3}$

Since, mirror formula $\dfrac{1}{v} + \dfrac{1}{u} = \dfrac{1}{f} \Rightarrow \dfrac{1}{f} = \dfrac{1}{u} + \dfrac{3}{u} = \dfrac{4}{u} \Rightarrow u = 4f = 4(-20) = -80$ cm $\Rightarrow$

$u = -80$ cm

The object should be placed at a distance of 80 cm from the concave mirror to form real and inverted image. $\left(1\tfrac{1}{2}\right)$

For convex mirror

Focal length $(f) = +20$ cm, magnificatio $(m) = +1/3$

Since, magnification $(m) = -\dfrac{v}{u} = \dfrac{1}{3} = -\dfrac{v}{u} \Rightarrow v = -\dfrac{u}{3}$

Using, mirror formula $\dfrac{1}{v} + \dfrac{1}{u} = \dfrac{1}{f} \Rightarrow \dfrac{1}{f} = \dfrac{-3}{u} + \dfrac{1}{u} = \dfrac{-2}{u} \Rightarrow u = -2f = -2(20) = -40$ cm

The object should be placed at a distance of 40 cm from the convex mirror to form virtual, erect and diminished image. $\left(1\tfrac{1}{2}\right)$

Q10. Pankaj is a student of class 7. He is very passionate about doing Science experiments. Recently, he visited Delhi with his parents to witness Science fair. He purchased different types of lenses, mirrors and other articles. One day, during games period, a student of same class fell down and his lips started bleeding.

On observation, it was found by physical education teacher that very fine pieces of glass, difficult to observe, stranded over there. Pankaj immediately rushed to Physics Lab and brought a lens. The bigger image of stranded glass pieces eased the first aid job.

Read the above passage and answer the following questions

(a) Name the lens or mirror brought by Pankaj.

(b) Draw the ray diagram showing formation of very big image of object by lens. What should be the position of object to get such image?

(c) What values are shown by Pankaj?

Sol. (a) Pankaj brought the double convex lens because it forms the magnified image of the object, thus it helps to see the fine pieces of glass. $\left(1\right)$

(b) *The ray diagram showing formation of very big image of object by lens is given below*
The object should be placed between optical centre and focus of lens.

(c) Values shown by Pankaj are sincerity, friendship, concern for others and learning attitude. $\left(1\right)$
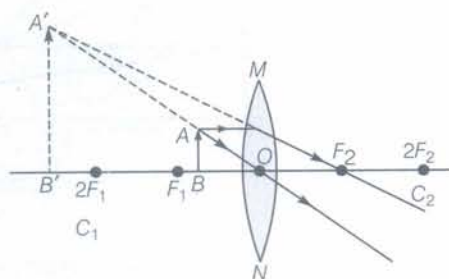
Q 11. (a) Define variation in relation to a species.

(b) 'Only variations that confer an advantage to an individual organism will survive in a population'. Comment on the statement.

Sol. *(a)* Reproductive processes in a species give rise to new individuals that are similar in basic body design but slightly different in characters (or traits). These slight differences are called variations. ①

(b) Depending on the nature of variations, different individuals have different kinds of advantage. In a population of bacteria that can withstand heat will survive better in a heat wave condition while those which do not have such variation will be eliminated. Hence, only the variations that confer advantage to an individual organism will survive in a population. ②

Q 12. The elements of third period are given below
Na, Mg, Al, Si, P, S, Cl

(a) Which is more metallic, S or Cl and why?

(b) Which has higher atomic mass, Al or Cl?

(c) Which is more electronegative, S or Cl and why?

Sol. *(a)* Metallic character (electropositive character) decreases on moving from left to right in a period. This is because as the nuclear charge increases in a period, it becomes more difficult for the atoms to lose electrons, *i.e.*, they become less electropositive. Hence, sulphur is more metallic than chlorine. ①

(b) Chlorine has higher atomic mass than that of aluminium. ①

(c) Electronegative character (non-metallic character) increases with increase in atomic number in a period. Due to increased nuclear charge in a period, it becomes easier for the atoms to gain electrons and they become more electronegative. Hence, chlorine is more electronegative than sulphur. ①

Q 13. (a) Calculate the difference in the molecular formulae and molecular masses for

(i) HCHO and CH_3CHO

(ii) CH_3CHO and C_2H_5CHO

(iii) C_2H_5CHO and C_3H_7CHO

(b) Is there any similarity in these three?

(c) Arrange these aldehydes in the order of increasing carbon atoms to get a family. Can we call this family a homologous series?

Sol. *(a)* All the pairs of aldehydes (i), (ii) and (iii) differ by one $-CH_2$ group in their molecular formula and by 14 u (12u + 2u = 14u) in their molecular masses. ①

(b) HCHO, CH_3CHO, C_2H_5CHO and C_3H_7CHO are the members of a homologous series of aldehyde family. That's why have almost same chemical properties. ①

(c) The homologous series of aldehyde family in increasing order of carbon atom is HCHO, CH_3CHO, C_2H_5CHO, C_3H_7CHO. We can call it homologous series as each member differs by one $-CH_2$ group. ①

Q 14. (a) Define dispersion of light.

(b) A lens X has a focal length 20 cm and lens Y has a focal length 40 cm. Which lens would you select to obtain a more convergent beam of light?

Sol. (a) Dispersion of light is the phenomenon of splitting of white light into its seven constituent colours on passing through a glass prism. ①

(b) Power of lens, $P = \dfrac{100}{f(\text{in cm})}$

$$P_x = \frac{100}{20} = 5D$$

$$P_y = \frac{100}{40} = 2.5D$$

The lens have large power of converging a parallel beam of light. Thus, lens X will be used to obtain a more convergent beam of light.

Q 15. Mention some details that can be inferred about organisms from their fossils.

Sol. *Some details that can be inferred about organisms from their fossils are*

(i) Phylogeny can be reconstructed from fossils.

(ii) Habits and behaviour of extinct organisms can be inferred from well preserved fossils.

(iii) Some fossils indicate connecting links between two groups of organisms. ①×3

Q 16. Explain the phenomenon of biological magnification. How does it affect the organisms to different trophic levels, particularly the tertiary consumers?

Sol. The increase in concentration of harmful chemicals such as fertilisers or pesticides in the living organisms at each trophic level through a food chain is known as biological magnification. ①

These chemicals are not degradable and get accumulated progressively at each trophic level. Maximum concentration of these chemicals get accumulated to the last trophic level. And as tertiary consumer occupy the last trophic level and are affected badly at the last trophic level. ②

Q 17. Write differences between asexual and sexual reproduction.

Sol. *The differences between asexual and sexual reproduction are*

S.No.	Asexual Reproduction	Sexual Reproduction
(i)	It involves only one parent.	Two parents are involved.
(ii)	No fertilisation and zygote formation is observed.	Fertilisation and zygote formation is observed.
(iii)	Meiosis does not occur at any time during reproduction.	Meiosis occurs at the time of gamete formation.

①×3

Q 18. How does embryo get nourishment inside the mother's body?

Sol. Embryo gets nourishment from mother's body with the help of placenta through a cord called umbilical cord. Placenta contains many finger-like villi extending from the chorion covering of the embryo. These villi maintain contact with blood sinuses of the mother, present in the intervillous space of uterus. All nutrients diffuse from mother's blood into villi and from there to embryo through the umbilical cord. ③

Q 19. Name the plant, Mendel used for his experiment. Explain F_1 and F_2 progeny obtained by Mendel when he bred the tall and the short varieties of the organism he experimented with.

Sol. Plant used by Mendel for his experiment was pea plant (*Pisum sativum*).

Mendel took a pure tall plant (TT) and crossed it with a dwarf (tt) plant. The progeny thus, obtained was called F_1 progeny (first filial progeny). (1/2)

	Parents
Tt (All tall)	Gametes
	F_1 progeny	(1)

Mendel selfed the F_1 progeny to obtain F_2-generation.

Tt
(All tall)

On selfing F_1 progeny

Gamete

F_2 progeny

	T	t
T	TT	Tt
t	Tt	tt

(1/2)

In F_2-generation, he found that 75% plants were tall and 25% were dwarf.

Thus, genotypic ratio obtained was TT : Tt : tt
$$1 : 2 : 1$$

Q 20. What is ethanol? State its two properties. What happens when it is heated with excess of conc. H_2SO_4 at 443 K? What role does conc. H_2SO_4 play in this reaction? Write chemical equation of the reaction involved and the structural formula of the main product formed.
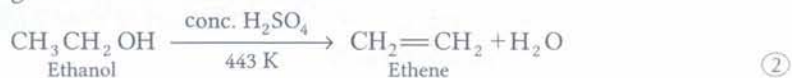
or

An organic compound A is an essential constituent of wine and beer. Oxidation of A yields an organic acid B, which is present in vinegar. Name the compounds A and B and write their structural formulae. What happens when A and B react in the presence of an acid catalyst? Write the chemical equation for the reaction.

Sol. Ethanol is an alcohol. Its chemical formula is CH_3CH_2OH. (1)

Properties of ethanol are
(i) It is a colourless, volatile liquid having pleasant smell and burning taste.
(ii) It is miscible with water in all proportions. $(\frac{1}{2} \times 2)$

Dehydration When ethanol is heated at 443 K (170°C) with excess of conc. sulphuric acid, a water molecule is given out and ethene is formed.

$$\underset{\text{Ethanol}}{CH_3CH_2OH} \xrightarrow[443 \text{ K}]{\text{conc. } H_2SO_4} \underset{\text{Ethene}}{CH_2=CH_2} + H_2O$$ (2)

Role of conc. H_2SO_4 In this reaction, conc. H_2SO_4 acts as a dehydrating agent (a substance which is used to remove water molecule). (1)

Structural formulae of main product *i.e.*, ethene.

$$\underset{\text{Ethene}}{\overset{H}{\underset{H}{>}}C=C\overset{H}{\underset{H}{<}}}$$ $(1\frac{1}{2})$
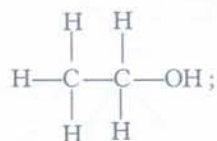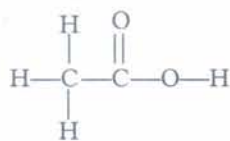
or

Organic compound 'A' is ethanol. It is an essential constituent of wine and beer. (1)

Vinegar contains acetic acid. It is an organic acid. Oxidation of A yields an organic acid B which is present in vinegar. So, organic acid B is acetic acid. (1)

Structural formulae of compounds A and B are

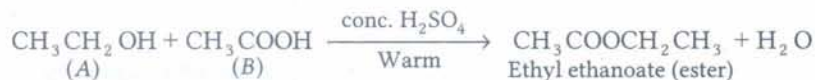$$H-\overset{\overset{\displaystyle H}{|}}{\underset{\underset{\displaystyle H}{|}}{C}}-\overset{\overset{\displaystyle H}{|}}{\underset{\underset{\displaystyle H}{|}}{C}}-OH\,;$$

Ethanol $(C_2H_5OH)\,;$
(compound A)

$$H-\overset{\overset{\displaystyle H}{|}}{\underset{\underset{\displaystyle H}{|}}{C}}-\overset{\overset{\displaystyle O}{||}}{C}-O-H$$

Ethanoic acid (CH_3COOH)
(compound B)

①

When A and B react in the presence of an acid catalyst, a pleasant smell of ester (ethyl ethanoate) is obtained.

①

$$CH_3CH_2OH + CH_3COOH \xrightarrow[\text{Warm}]{\text{conc. } H_2SO_4} CH_3COOCH_2CH_3 + H_2O$$
$\quad (A) \qquad\qquad (B) \qquad\qquad\qquad\qquad$ Ethyl ethanoate (ester)

①

Q 21. Name any three common defects of vision and state the cause of each defect. A person cannot see objects beyond 2 m distinctly. State the nature and focal length of the lens which could be used to correct his vision.

or

Draw ray diagrams and show the nature of images formed in the following cases when

(a) Object is placed between F and $2F$ in front of concave lens.

(b) Object is placed at infinity of convex mirror.

(c) Object is placed between F and $2F$ in front of convex lens.

Sol. *The three common defects of vision and their causes are*

S.No.	Defect	Cause
(i)	Myopia or short-sightedness	Excessive curvature of eye lens. Elongation of eyeball.
(ii)	Hypermetropia or long-sightedness	Focal length of eye lens becomes large. Eyeball becomes too short.
(iii)	Presbyopia or old age long-sightedness	Weakening of ciliary muscles. Hardening of eye lens.

(1×3)

As the person cannot see far off objects. So, he is suffering from myopia or short-sightedness.

(1/2)

For the myopic eye, Object distance, $u = -\infty$, Image distance, $v = -2$ cm $= -200$ m (far point)
Using lens formula,

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Rightarrow \frac{1}{f} = \frac{1}{-200} - \frac{1}{-\infty}$$

or $\qquad\qquad f = -200$ cm

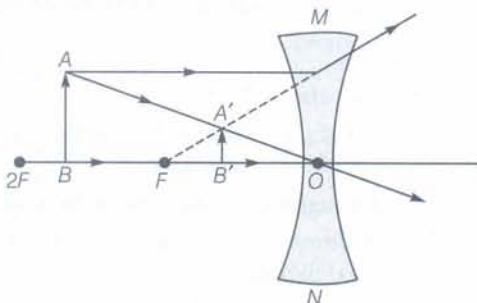or $\qquad\qquad f = -2$ m

∴ $\qquad$ For its correction a concave lens of focal length 2.0 m is required.
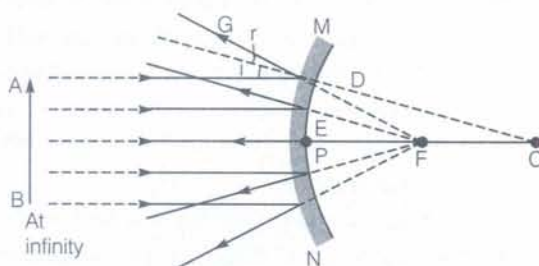
$(1\frac{1}{2})$

or

(a) The diminished, virtual and erect image of the object is formed between optical centre and principal focus, F on the same side as the object, *as shown below.*
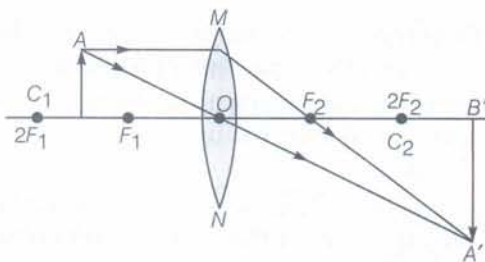

②

(b) The virtual, erect and highly diminished image of the object is formed at focus F, behind the mirror, *as shown below.*

$1\frac{1}{2}$

(c) The enlarged, real and inverted image of the object is formed beyond $2F$ on the other side of the lens, *as shown below.*

$1\frac{1}{2}$

Q 22. What is environmental planning? List any four human activities that are directly connected to influence environment of a region.

or

How can you as individual contribute or make a difference to the management of

(a) forests and wildlife,   (b) water resources and

(c) coal and petroleum?

Sol. Environmental planning involves various steps and measures which are taken to reduce the environmental pollution and to conserve natural resources for long term use. Thus, to maintain the ecological balance on earth, environmental planning is very important.   ①

Human activities which influence the environment of a region are

(i) Burning of fossil fuels in excess. It causes air pollution by releasing poisonous gases, smoke and flyash.

(ii) Excessive use of fertilisers, pesticides, detergents and plastic. These are non-biodegradable and result in water pollution.

(iii) Large scale destruction of forest reduces rainfall, groundwater table, biodiversity and natural habitat of many animals.

(iv) Discharge of untreated sewage and industrial waste into water-bodies. It affects aquatic life as it decreases dissolved O_2 level of water-bodies. ④

or

Sol. *(a)* Forests and wildlife

(i) We should judiciously use the forest products and cutting trees for paper, timber, etc should be controlled.

(ii) Killing of wild animals for their skin, etc should be banned.

(iii) Afforestation should be practised and management of the forest should be given to local people. $(1\frac{1}{2})$

(b) Water resources

(i) Leaking taps should be repaired.

(ii) Water from industries should not be directly dumped in the river water.

(iii) Use of insecticides and pesticides should be minimised, which are washed away with rain and contaminate river water and underground water.

(iv) Methods like rainwater harvesting, construction of cannal should be promoted. Construction of dams may also prove beneficial. ②

(c) Coal and petroleum

(i) Use of coal and petroleum as a source of energy should be minimised.

(ii) Use of CNG or LPG as fuels in automobiles should be promoted.

(iii) Renewable sources of energy like solar power, hydropower, wind energy, tidal energy, etc should be used. It is a better to walk over a short distance rather than going by car scooter. $(1\frac{1}{2})$

Q 23. Detergents, the surfactants, reduce the surface tension of water and thus, help in cleaning the clothes or objects like utensils, floors etc. They are preferred over soaps as they can produce lather with hard as well as soft water and can be used under acidic conditions thus, are more soluble in water.

A great disadvantage of detergents is that most of them are non-biodegradable. Also they affect the texture and colour of fabrics.

Read the above passage and answer the following questions

(a) Use of synthetic detergents should be stopped or not. Justify your answer with both positive and negative responses.

(b) What lesson do you infer from the above passage?

or

(a) What is molecular phylogeny?

(b) Evolution is continous or discontinuous. Explain.

Sol. *(a)* In favour of positive response , synthetic detergents

(i) Can be used with hard water or acidic water

(ii) Save fats and oils for human consumption

(iii) Better cleansing agent than soap. $(1\frac{1}{2})$

In favour of negative response , synthetic detergents

(i) Are non-biodegradable, lead to water pollution.

(ii) Reduce the dissolved oxygen (DO) of water, Thus, resulting in the death of certain aquatic organisms.

(iii) Affect the texture and colour of fabrics. $(1\frac{1}{2})$

(b) From the given passage, it is inferred that although detergents and surfactants have some qualities but being non-biodegradable they must be replaced by other biodegradable substances. ②

or

(a) Molecular phylogeny is used to trace evolutionary relationships. DNA of different species is compared in this process. Hence, greater the difference in DNA, more distantly related are the species. ②

(b) Evolution is a continuous process as it occurs in several stages over a long period of time. The complex organs are formed slowly over in many generations and sometimes intermediate forms may also have an important role in it. (1+2)

Q 24. Describe the process of 'double fertilisation.'

or

Figure of male reproductive system is shown below
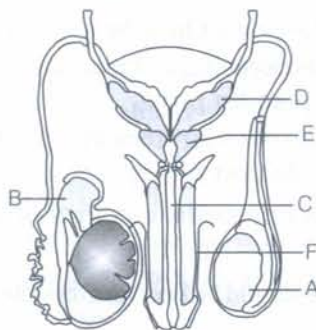
(a) Name the parts labelled A to E, in the given figure.

(b) Name the following
  (i) Place where sperms become mature and develop motility.
  (ii) Passage for both urine and spermatic fluid.
  (iii) Secrete fluid for nourishment of sperms.
  (iv) Produce sperms.

Sol. *Fusion of male and female gametes takes place in plants in the following ways*
  (i) On reaching the stigma, the pollen grain develops a pollen tube.
  (ii) This pollen tube grows through the style and reaches the ovary where the ovules are located.
  (iii) The pollen tube enters the ovule through a small opening called micropyle, where it releases two male gametes into the embryo sac.
  (iv) One male gamete fuses with the egg contained in the embryo sac of the ovule. This fusion of male and female gametes is called **syngamy** and its product is called zygote.
  (v) The other male gamete fuses with the two polar nuclei and this process is called **triple fusion** and its product is called endosperm.
    This process occurs inside each embryo sac and is called **double fertilisation** as two fusions take place, *i.e.*, syngamy and triple fusion. (1×5)
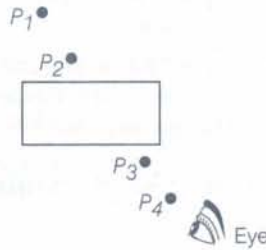
or

(a) A—Testis, B—Epididymis, C—Urethra, D—Seminal vesicle, E—Prostate glands, F—Penis ($\frac{1}{2}$×6)

(b) (i) Epididymis
  (ii) Urethra
  (iii) Seminal vesicle
  (iv) Testis ($\frac{1}{2}$×4)

Q 25. In the glass slab experiment shown below, four students A, B, C and D did the following


I. Kept the eyes far from the glass slab while placing both the pins P_3 and P_4.

II. Kept the eyes close to the glass slab while placing both the pins P_3 and P_4.

III. Kept the eyes close to the glass slab while placing pin P_3 and far from the slab while placing pin P_4.

IV. Kept the eyes far from the glass slab while placing pin P_3 and close to the slab while placing pin P_4.

The correct procedure is that of student

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

Sol. *(a)* The eye should be kept far from the glass slab to have a good and proper alignment of the pins.

Q 26. Out of the four set up shown for carrying out the experiment to trace the path of a ray of light through a rectangular glass slab, the best set up is
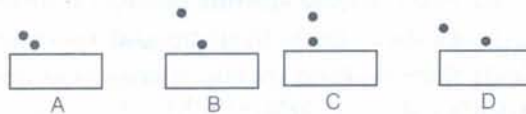
(a) A   (b) B   (c) C   (d) D

Sol. *(b)* The two pins on the incident ray should be relatively far apart and the angle of incidence preferably between 30° and 60°.

Q 27. With both eyes open, a person's field of view is about

I. 90°   II. 155°   III. 180°   IV. 360°

The correct options are

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

Sol. *(d)* The total visual field with both eyes open is around 180° horizontally and 155° vertically.

Q 28. In which type of lens linear magnification is always less than one?

(a) Concave lens   (b) Convex lens
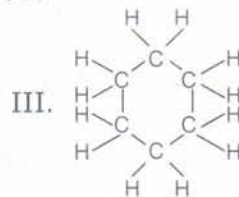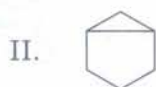
(c) Simple lens   (d) None of these

Sol. *(a)* Concave lens always has linear magnification less than one because it always gives diminished images.

Q 29. The human eye forms the image of an object at its

(a) retina   (b) pupil   (c) iris   (d) cornea

Sol. *(a)* Retina is the back surface of eye.

Q 30. Structural formula of cyclohexane is

I. II. III. IV.

The correct structural formulae are

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

Sol. *(b)* Cyclohexane is a saturated cyclic hydrocarbon of class cycloalkanes. In cycloalkanes, all the C—C bonds are single bonds and each carbon atom is linked to 2 hydrogen atoms.

Q 31. Which of the following statements about graphite and diamond are not true?
  I. They have same crystal lattice structure
  II. They have same electrical conductivity
  III. They can undergo same chemical reaction
  IV. They have same degree of hardness

The correct options are

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

Sol. *(d)* Diamond and graphite are the allotropes of carbon. These are made up of carbon atoms only. Hence, their chemical properties are similar (They differ only in their physical properties).
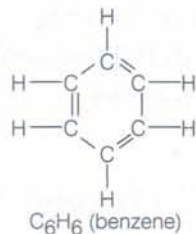
Q 32. Benzene molecule has
  I. 3 C—C bonds II. 3 C=C bonds III. 6 C—H bonds IV. 3 C=C bonds

The correct options are

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

Sol. *(d)* The structure of benzene molecule is as

C_6H_6 (benzene)

Q 33. Which of the following does not belong to the same homologous series?
  I. CH_4 II. C_2H_6 III. C_3H_6 IV. C_3H_4

The correct options are

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

Sol. *(d)* C_3H_4 is propyne, it belongs to alkynes series while CH_4, C_2H_6 are alkanes as they have the same general formula C_nH_{2n+2}. C_3H_6 is an alkene.

**Q 34.** Addition reactions are given by
  I. ketones II. aldehydes III. alkanes IV. alkenes

The correct options are

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

Sol. *(c)* Addition reactions are given by unsaturated compounds which contain C=C, C≡C, C=O, etc. Therefore, aldehydes, ketones, alkenes and alkynes give addition reactions, expect alkanes which give substitution reactions.

Q 35. The correct diagram showing an *Amoeba* undergoing binary fission is

(a) (b) (c) (d)
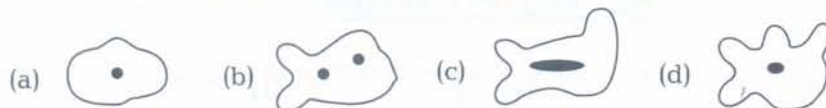
Sol. (c) Irregular shaped *Amoeba* when undergoes binary fission, its nucleus elongates and then the cytoplasm divides into two parts.

Q 36. A small protuberance is observed in yeast cell which grows into
(a) bud
(b) abnormal growth
(c) infected area
(d) tumour

Sol. (a) Budding involves the formation of a bud outside of the cell wall of parent cell.

Q 37. In *Opuntia*, stem is modified into phylloclade to
(a) increase photosynthesis
(b) reduce transpiration
(c) to store food
(d) to keep animals away

Sol. (b) To prevent the loss of water, stem of *Opuntia* gets modified into phylloclade.

Q 38. Which of the following groups contain only biodegradable items?
(a) Grass, flowers and leather
(b) Grass, wood and plastic
(c) Fruit peels, cake and lime juice the conbination of
(d) Cake, wood and grass

Sol. (c) Only fruit peels, cake and lime juice are the combination of biodegradable items rest others are non-biodegradable.

Q 39. An ecosystem may be defind as
(a) group of plant which act as energy supplier
(b) Different communities of plants, animals human beings and microbes together with their physio-chemical environments
(c) functional unit for ecological studies
(d) None of the above

Sol. (b)

Q 40. Flow of energy in an ecosystem is always
(a) unidirectional
(b) bidirectional
(c) multidirectional
(d) no specific direction

Sol. (a) In an ecosystem, flow of energy is unidirectional as it flows from one trophic level to another.

Q 41. The anther contains
(a) sepals
(b) ovules
(c) carpel
(d) pollen grains

Sol. (d) Anther is a part of male reprpductive organ of a plant which is involed in the formation and storage of pollen grains.

Q 42. Propanoic acid is
(a) $CH_3—CH=CH_2$
(b) $CH_3—CH_2—COOH$
(c) $CH_3—CH_2—CHO$
(d) $CH_3\ COCH_3$

Sol. (b) $CH_3—CH_2—COOH$ is propanoic acid because it contains 3 carbon atoms and a—COOH as a functional group.