

SECTION A

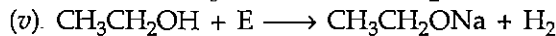
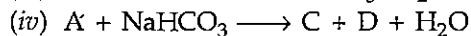
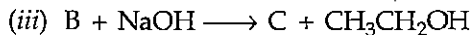
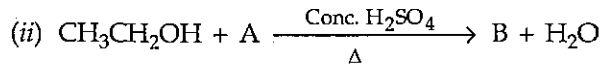
1. What is the function of pupil in human eye ? (1)
2. Saturated hydrocarbons burn with a blue flame while **unsaturated** hydrocarbons burn with a sooty flame. (1)
3. What are the basic events in evolution ? (1)
4. Draw a neat diagram to show the refraction of a light ray through a glass prism, and label on it the angle of incidence, and angle of deviation. (2)
5. Why does the sun appear reddish early in the morning ? Illustrate with the help of a labelled diagram. (2)
6. (a) "Sun is the ultimate source of energy of fossil fuels." Justify this statement. (2)
- (b) Write two disadvantages of using fossil fuels. (2)
7. Differentiate between self and cross-pollination. (2)
8. A needle placed 45 cm from a lens forms an image on a screen placed 90 cm on the other side of the lens. Identify the type of lens. Determine its focal length and the power. What is the size of image if, needle is 5 cm in height ? (3)
9. A person wears spectacles of power -2.5 D. Name the defect of vision he is suffering from. Draw the ray diagram for (i) the defect, (ii) its correction after using a suitable lens. (3)

10. (a) For the same angle of incidence 45° , the angle of refraction in two transparent media; I and II is 20° and 30° respectively. Out of I and II, which medium is optically denser and why ?
- (b) Light enters from air to diamond which has refractive index of 2.42. Calculate the speed of light in diamond, if speed of light in air is $3.00 \times 10^8 \text{ m s}^{-1}$. (3)
11. Explain why ?
- (i) Danger signals are red in colour.
- (ii) Convex mirrors are commonly used as rear view mirrors. (3)
12. Describe an activity to show the formation of an ester in the school laboratory. (3)
13. An element X placed in 2nd group and 4th period of the periodic table burns in the presence of oxygen to form a basic oxide.
- (a) Identify the element.
- (b) Write its electronic configuration.
- (c) Write a balanced equation for the reaction when this oxide is dissolved in water. (3)
14. (a) State any four environmental problems caused by man.
- (b) Bring out the meaning of the term biodegradable. (3)
15. (a) What is biodiversity ?
- (b) Name any two wastes that can be recycled and reused. (3)
16. What changes are observed in the uterus subsequent to implantation of young embryo ? (3)
17. What is regeneration ? Explain with the help of suitable example. (3)
18. Outline a project which aims to find the dominant coat colour in dogs. (3)
19. What evidence do we have for the origin of life from inanimate matter ? (3)
20. (i) Under what condition, a concave mirror produces a virtual and magnified image ? Draw a labelled ray diagram to show the formation of image in the above case. Also state the position of object to produce magnified and real image.
- (ii) A ray of light moving along principal axis is falling on a concave mirror. Draw the path of reflected ray. Also state the values of angle of incidence and reflection in this case. (5)
- Or**
- (i) Where should an object be placed in case of a convex lens to form an image of same size as of the object. Show with the help of a ray diagram the position and nature of the image formed.
- (ii) With the help of ray diagram, illustrate the change in position, nature and size of the image formed if the convex lens in case (i) is replaced by concave lens of same focal length.
- (iii) State the condition under which a light ray passes undeviated through a lens.
21. An organic compound A on heating with Conc. H_2SO_4 forms a compound B which on addition of one mole of hydrogen in presence of Nickel forms a compound C. One mole of C on combustion forms 2 moles of CO_2 and 3 moles of H_2O . Identify the compounds A, B and C and write the equations for the reactions involved. (5)

Or

Identify the compounds A to E in the following reaction sequence :





22. A quiz contest was being held in the school for chemistry students. The quiz-master said :

An element has the electronic configuration 2, 8, 7.

(a) What is the atomic number of this element ?

(b) Which of the elements N, F, P and Ar shows similarity with this element ?

(c) We daily use a compound of this element in our food. What is that ?

(d) A compound of this element causes hardness of water. What is that ?

Rohit replied to all these questions correctly. Can you reproduce his answers ? (5)

23. (i) What is genetics ?

(ii) Give common name of the plant on which Mendel performed his experiments ?

(iii) What for did Mendel used the term factor and what are these factors called now ?

(iv) What are genes ? Where are the genes located ? (5)

Or

What are the various evidences in favour of evolution ?

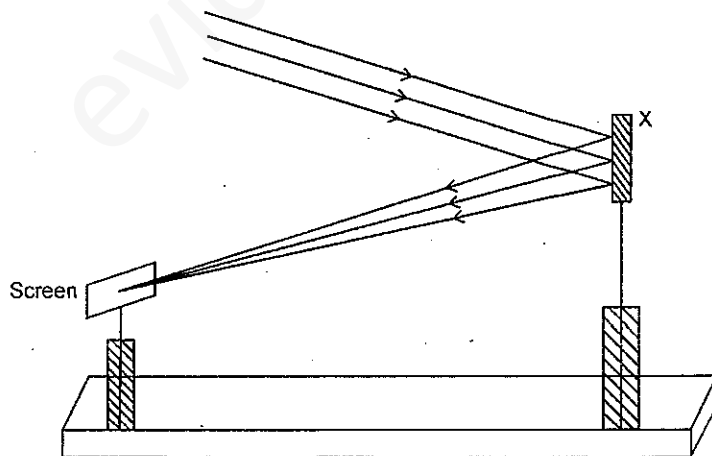
24. Describe menstrual cycle. (5)

Or

Describe the female reproductive system with the help of a suitable diagram.

SECTION B

25. Anita determines the focal length of an optical device X by focussing a well illuminated distant building on the screen (as shown in the figure). The device X is (1)



(a) Concave mirror

(b) Convex mirror

(c) Plane mirror

(d) Convex lens

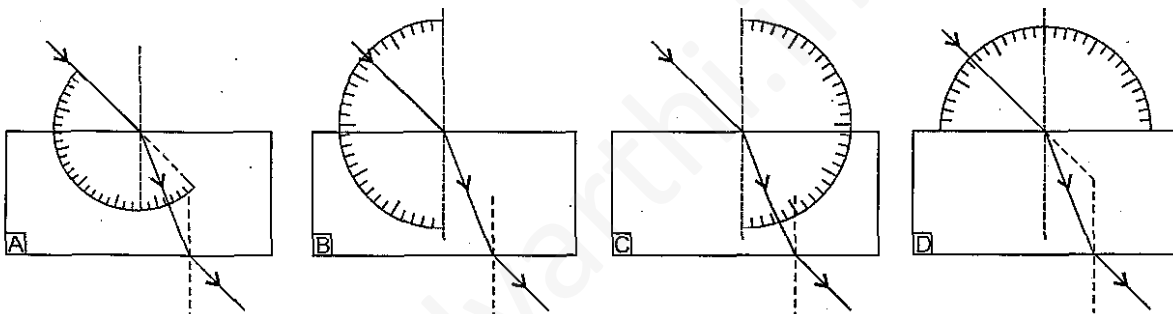
26. To determine the focal length of a convex lens, Toni obtained the image of a distant tower on a screen. For getting correct result he should now measure the distance between the (1)

- (a) screen and tower
- (b) lens and tower
- (c) lens and screen
- (d) screen and tower and also between the lens and tower.

27. Monika has to determine the focal length of a concave mirror and a convex lens of focal length about 15 cm each. She uses a distant tree as the object and obtains the sharp image of the tree, one by one on a screen. The distances l_1 and l_2 between the mirror/lens and the screen in the two cases and the nature of their respective images obtained on the screen are likely to be (1)

- (a) (30 cm, 15 cm) and (erect, inverted)
- (b) (15 cm, 15 cm) and (inverted, inverted)
- (c) (15 cm, 30 cm) and (inverted, erect)
- (d) (30 cm, 30 cm) and (inverted, inverted)

28. A student traces the path of a ray of light passing through a rectangular glass slab. (1)



For measuring the angle of incidence, he must position the protractor in the manner shown in figure :

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

29. David recorded the following sets of observations during the experiment with a glass slab while tracing the path of a ray of light passing through a rectangular glass slab for four different values of angle of incidence.

S.No.	$\angle i$	$\angle r$	$\angle e$
I	30°	19°	30°
II	40°	27°	39°
III	50°	40°	50°
IV	60°	35°	60°

The incorrect observation is at the serial number (1)

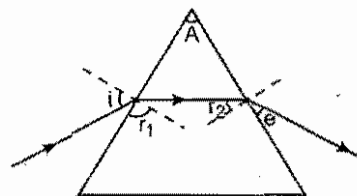
- (a) I
- (b) II
- (c) III
- (d) IV

30. In the experiment on refraction of light through a glass slab done by four students, A, B, C, D, the following observations were made. Which of the students made the correct observations? (1)

- (a) The emergent ray moves towards the normal after second refraction through glass slab with $\angle i = 40^\circ$

- (b) The emergent ray moves away from normal after second refraction through glass slab with $\angle i > \angle e$.
- (c) For any angle of incidence, always $\angle i > \angle e$.
- (d) The emergent ray moves away from normal after second refraction through glass slab with $\angle i = \angle e$.

31. A student performed an experiment to draw the path of a light ray as a result of refraction through a prism. He marked the angle of incidence i , angles of refraction r_1 and r_2 and the angle of emergence e as shown in the adjoining figure. Which of these angles has/have been marked wrongly ? (1)



- (a) i and e (b) r_1 and e
- (c) r_1 and r_2 (d) r_2 and e .

32. Dilute acetic acid was added to the four beakers containing following chemicals :

- (I) NaCl (II) NaHCO₃
- (III) KOH (IV) K₂CO₃

Brisk effervescence and evolution of colourless gas was observed in the beakers. (1)

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

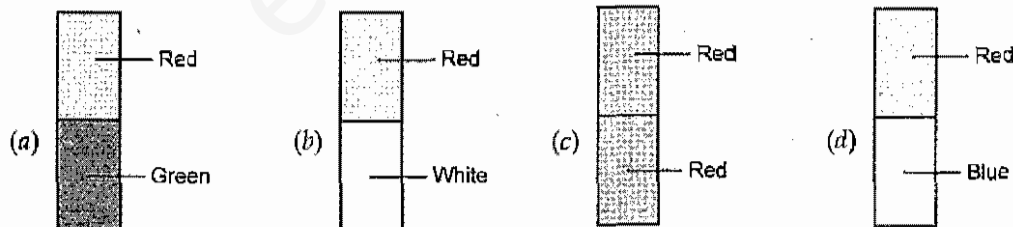
33. 5 mL of acetic acid was added to 5 mL of water in a test tube. After shaking the mixture and keeping it undisturbed for about 10 minutes. It is observed that (1)

- (a) the mixture turns red.
- (b) a strip of red litmus paper dipped in the mixture turns blue.
- (c) two separate layers of water and acetic acid are seen in the test tube.
- (d) a clear solution having vinegar like odour is formed.

34. Which of the following cannot be used for the preparation of soap ? (1)

- (a) Castor oil (b) Mobil oil
- (c) Groundnut oil (d) Linseed oil

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



36. Sodium stearate (soap) is added to hard water containing calcium sulphate. The reaction leads to the formation of (1)

- (a) Calcium oxide (b) Calcium stearate
- (c) Calcium hydrogensulphate (d) Calcium carbonate

37. Presence of calcium and magnesium salts in water precipitates the soap and (1)

- (a) reduces its cleansing power and foaming capacity.
- (b) reduces its foaming capacity and cleansing power.

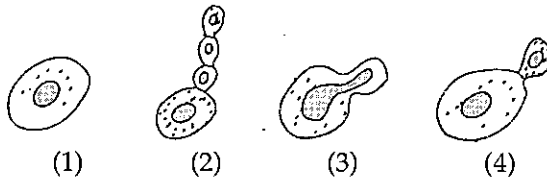
(c) does not reduce cleansing power but reduces foaming capacity.

(d) neither cleansing power nor foaming capacity is reduced.

38. Which of the following reproduce by binary fission ?

- (a) Yeast (b) Amoeba (c) Malarial parasite (d) Hydra.

39. Following diagrams depict the stages of budding in yeast. The correct sequence is

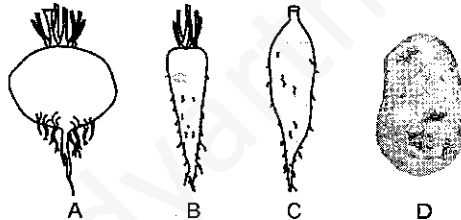


- (a) 1, 2, 3, 4 (b) 1, 3, 4, 2 (c) 1, 4, 2, 3 (d) 3, 2, 1, 4

40. In binary fission of Amoeba

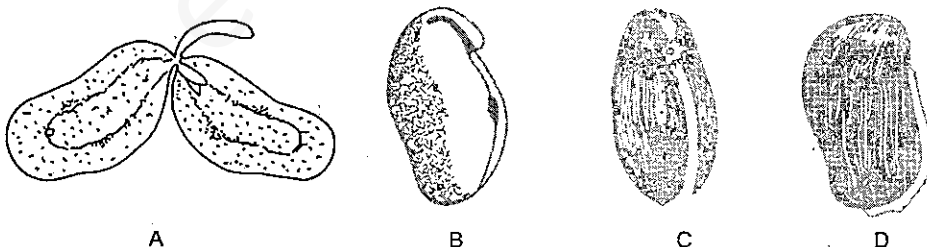
- (a) two daughter amoebae are formed by single amoeba.
(b) one daughter amoeba is formed by single amoeba.
(c) many daughter amoebae are formed by single amoeba.
(d) indefinite daughter amoebae are formed by single amoeba.

41. Which statement with regard to figure A, B, C, D is correct ?



- (a) A, B, D are homologous organs (b) B, D, C are homologous organs
(c) A, B, C are homologous organs (d) B, C, D are homologous organs

42. The correct sequence showing germination in bean seed is



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