

Section– A

1. Write the name and formula of the 2nd member of homologous series having general formula C_nH_{2n} .
2. List two functions performed by the testis in human beings.
3. What is the function of ozone in the upper atmosphere?
4. List four characteristics of the images formed by plane mirrors.
5. Why are forests considered “biodiversity hot spots”? List two ways in which an individual can contribute effectively to the management of forests and wildlife.
6. What is meant by “sustainable management”? Why is reuse considered better than recycling?
7. With the help of an example, explain the process of hydrogenation. Mention the essential conditions for the reaction and state the change in physical property with the formation of the product.
8. What is the difference between the molecules of soaps and detergents, chemically? Explain the cleansing action of soaps.
9. How many groups and periods are there in the modern periodic table? How do the atomic size and metallic character of elements vary as we move:
 - (a) down a group and
 - (b) from left to right in a period
10. From the following elements:
 ${}_4\text{Be}$, ${}_9\text{F}$, ${}_{19}\text{K}$, ${}_{20}\text{Ca}$
 - (i) Select the element having one electron in the outermost shell.
 - (ii) Two elements of the same group.

Write the formula of and mention the nature of the compound formed by the union of ${}_{19}K$ and element X (2, 8, 7).

11. What is DNA copying? State its importance.

12. Explain budding in hydra with the help of labelled diagrams only.

13. List any four methods of contraceptions used by humans. How does their use have a direct effect on the health and prosperity of a family.

14. "We cannot pass on to our progeny the experiences and qualifications earned during our life time." Justify the statement giving reason and examples.

15. (i) Planaria, insects, octopus and vertebrates all have eyes. Can we group eyes of these animals together to establish a common evolutionary origin? Justify your answer.

(ii) "Birds have evolved from reptiles". State evidence to prove the statement.

16. To construct a ray diagram we use two rays of light which are so chosen that it is easy to determine their directions after reflection from the mirror. Choose these two rays after reflection from a concave mirror. Use these two rays to find the nature and position of the image of an object placed at a distance 15cm from a concave mirror of focal length 10cm.

17. With the help of labelled diagram, explain why the sun appears reddish at the sun-rise and the sun-set.

18. After the examinations Rakesh with his friends went on a picnic to a nearby park. All friends carried cooked food packed in plastic bags or plastic cans. After eating the food some friends collected the leftover food and plastic bags etc and planned to dispose them off by burning. Rakesh immediately checked them and suggested to segregate the leftover food and peels of fruits from the plastic materials and respectively dispose them off separately in the green and red dustbins placed in the corner of the park.

(a) In your opinion, is burning plastic an eco-friendly method of waste disposal? Why? State the advantage of method suggested by Rakesh?

(b) How can we contribute in maintaining the parks and roads neat and clean?

19. Explain why carbon forms compounds mainly by covalent bond. Explain in brief two main reasons for carbon forming a large number of compounds. Why does carbon form strong bonds with most other elements?

20. Write the functions of the following in human female reproductive system:

Ovary, oviduct, uterus

How does the embryo get nourishment inside the mother's body? Explain in brief.

21. How many pairs of chromosomes are present in human beings? Out of these how many sex chromosomes? How many types of sex chromosomes are found in human beings? "The sex of a new born child is matter of chance and none of the parents may be considered responsible for it". Draw a flow chart showing determination of sex of a new born to justify this statement.

22. (a) State the laws of refraction of light. Explain the term absolute refractive index of a medium and write an expression to relate it with the speed of light in vacuum.

(b) The absolute refractive indices of two media 'A' and 'B' are 2.0 and 1.5 respectively. If the speed of light in medium 'B' is 2×10^8 m/s, calculate the speed of light in:

(i) vacuum,

(ii) medium 'A'.

23. "A convex lens can form a magnified erect as well as magnified inverted image of an object placed in front of it". Draw ray diagram to justify this statement string the position of the object with respect to the lens in each case.

An object of height 4 cm is placed at a distance of 20cm from a concave lens of focal length 10cm. Use lens formula to determine the position of the image formed.

24. A student is unable to see clearly the words written on the black board at a distance of approximately 4m from him. Name the defect of vision the boy is

suffering from. Explain the method of correcting this defect. Draw ray diagram for the:

- (i) defect of vision and also
- (ii) for its correction.

SECTION: B

25. A student adds 2ml of acetic acid to a test tube containing 2ml of distilled water. He then shakes the test tube well and leaves it to settle for some time. After about 5 minutes he observes that in the test tube there is:

- (A) a clear transparent colourless solution
- (B) a clear transparent pink solution
- (C) a precipitate settling at the bottom of the test tube
- (D) a lawyer of water over the layer of acetic acid

26. A student prepared 20% sodium hydroxide solution in a beaker to study saponification reaction. Some observations related to this are given below:

- (i) Sodium hydroxide solution turns red litmus blue
- (ii) Sodium hydroxide readily dissolves in water
- (iii) The beaker containing solution appears cold when touched from outside
- (iv) The blue litmus paper turns red when dipped into the solution.

The correct observations are:

- (A) (i), (ii) and (iv)
- (B) (i), (ii) and (iii)
- (C) only (iii) and (iv)

(D) only (i) and (ii)

27. Hard water is not available for an experiment. Some salts are given below:

(i) Sodium chloride

(ii) Sodium sulphate

(iii) Calcium chloride

(iv) Calcium sulphate

(v) Potassium chloride

(vi) Magnesium sulphate

Select from the following a group of these salts, each member of which may be dissolved in water to make it hard.

(A) (i), (ii) and (v)

(B) (i), (iii), (v)

(C) (iii), (iv), (vi)

(D) (ii), (iv), (vi)

28. A student identified the various parts of an embryo of a gram seed and listed them as given below:

(i) Testa

(ii) Plumule

(iii) Radicle

(iv) Cotyledon

(v) Tegmen

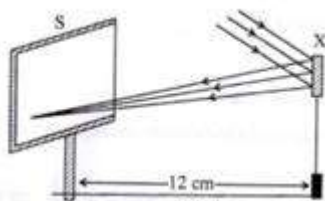
Out of these the actual parts of the embryo are:

- (A) (i), (ii), (iii)
- (B) (ii), (iii), (iv)
- (C) (iii), (iv), (v)
- (D) (ii), (iv), (v)

29. For students A, B, C and D reported the following set of organs to be homologous. Who is correct?

- (A) Wings of a bat and a butterfly
- (B) Wings of a pigeon and a bat
- (C) Wings of a pigeon and a butterfly
- (D) Forelimbs of a cow, a duck and a lizard

30. Study the following diagram and select the correct statement about the device 'X':



- (A) Device 'X' is a concave mirror of radius of curvature 12 cm.
- (B) Device 'X' is a concave mirror of focal length 6 cm.
- (C) Device 'X' is a concave mirror of focal length 12 cm.
- (D) Device 'X' is a convex mirror of focal length 12 cm.

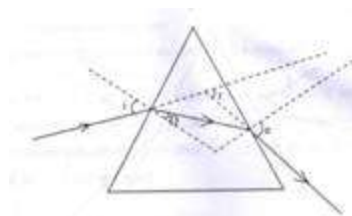
31. A student has obtained a point image of a distant object using the given convex lens. To find the focal length of the lens he should measure the distance between the:

- (A) lens and the object only
- (B) lens and the screen only
- (C) object and the image only
- (D) lens and the object and also between the object and the image

32. Four students P, Q, R and S traced the path of a ray of light passing through a glass slab for an angle of incidence 40° and measured the angle of refraction. The value as measured them were 18° , 22° , 25° and 30° respectively. The student who has performed the experiment methodically is

- (A) P
- (B) Q
- (C) R
- (D) S

33. After tracing the path of a ray of light through a glass prism a student marked the angle of incidence ($\angle i$), angle of refraction ($\angle r$) angle of emergence ($\angle e$) and the angle of deviation ($\angle D$) as shown in the diagram. The correctly marked angles are:



- (A) ($\angle i$) and ($\angle r$)
- (B) ($\angle i$) and ($\angle e$)

(C) $(\angle i)$, $(\angle e)$ and $(\angle D)$

(D) $(\angle i)$, $(\angle r)$ and $(\angle e)$

34. List two observations which you make when you add a pinch of sodium hydrogen carbonate to acetic acid in a test tube. Write chemical equation for the reaction that occurs.

35. Name the type of asexual reproduction in which two individuals are formed from a single parent and the parental identity is lost. Draw the initial and the final stages of this type of reproduction. State the event with which this reproduction starts.

36. To find the image-distance for varying object-distances in case of a convex lens, a student obtains on a screen a sharp image of a bright object placed very far from the lens. After that he gradually moves the object towards the lens and each time focuses its image of the screen.

(a) In which direction – towards or away from the lens, does he move the screen to focus the object?

(b) What happens to the size of image -does it increase or decrease?

(c) What happen when he moves the object very close to the lens.