Section-A

1. State the position of inert gases in the Modern Periodic Table? Name one inert gas. 1
2. Give two factors because of which evolution takes place. 1
3. Define decomposers in eco system. 1
4. Which environmental problems are we facing today due to burning of fossil fuels? 2
5. Explain with an example, the importance of 'Reduce' in saving environment. 2
6. Mention one similarity and one difference between the image formed by a plane mirror and convex mirror. 2
7. What are fossils? How are they important in study of evolution? 2
8. The following table shows the position of six elements A, B, C, D, E, F in the periodic table. 2

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R/6 [P.T.O.]
Using the above table answer the following questions:

(1) Which element will form only covalent compound?
(2) Which element is a non-metal with a valency of 2?
(3) Which element has bigger atomic size E or F?

9. Name a cyclic unsaturated hydrocarbon, containing three double bonds. Draw its structure. Also draw the structure of cyclopentane.

10. Justify the nature of physical and chemical properties of compounds of homologous series.

11. Complete the following equations:
   (i) \( \text{CH}_3\text{COOC}_2\text{H}_5 \xrightarrow{\text{NaOH}} \)
   (ii) \( \text{CH}_3\text{COOH} + \text{NaHCO}_3 \rightarrow \)
   (iii) \( \text{CH}_4 + \text{Cl}_2 \xrightarrow{\text{Sunlight}} \)

12. One day Sarla found her friend Seema very sad in class. She talked to Seema and tried to know the reason behind it. Seema very reluctantly said that my brother is always given more love and affection in family, specially by my father and also by grandmother. He is permitted to do whatever he wants and I am criticized for everything I do or I need.
   (a) Which kind of social evil it is?
   (b) What creates this difference?
   (c) As a student what can be your role to remove this social evil?

13. With the help of a suitable diagram, explain reproduction in Rhizopus, by spore formation.

14. (a) Why do traits such as intelligence and knowledge acquired by an individual in his/her life time cannot be passed on to the next generation?
   (b) Name two traits which can be passed on to the progeny.

15. Write three differences between pollination and fertilization.

16. (a) State the factors on which the relative refractive index of a pair of media depends.
   (b) Light enters from air into water which has refractive index of 1.33. Calculate the speed of light in water. The speed of light in air is \( 3 \times 10^8 \) m/s.

17. A concave mirror has a radius of curvature of 0.4 m. Find the position and size of the image of an object 0.2 m high placed 0.8 m in front of the mirror.

18. A convex mirror used for rear-view of an automobile has a radius of curvature 3.0 m. If a bus is located at 5.0 m from this mirror find the position, nature and relative size of the image.

19. List three main reasons attributed to the failure to sustain water availability in a particular region.

20. (i) What are soaps? Why do soaps not produce lather in hard water?
   (ii) Explain the mechanism of cleaning action of soap.
   (iii) Will a micelle be formed in other solvents like ethanol also? Justify your answer.

[ 2 ]
21. (i) Define Variation in relation to species.
   (ii) Describe briefly four ways in which individual with a particular trait may increase in population.

22. Why it is more appropriate to compare the process of evolution with branches of a tree rather than with a ladder?

23. (a) Write the relation between object distance, image distance from a lens and focal length of a lens.
   (b) A concave lens of focal length 15 cm forms an image of an object kept at distance of 10 cm from the lens. Find the position, nature and relative size of the image formed by it.
   (c) Draw ray diagram to show the image formed by a convex lens when an object is kept between Focus and optical centre of lens.

24. (a) State the laws of Refraction.
   (b) Define Absolute refractive index and Relative refractive index.
   (c) Refractive index of water, crown glass, kerosene and benzene are 1.33, 1.52, 1.44, 1.50 respectively, complete the following diagram with the information.

   ![Refractive Index Diagram]

25. 5 ml of ethanoic acid was taken in two test tubes I and II. 5 ml of water was added to test tube II. The following observations were reported by four students A, B, C and D:
   (A) Test tube II has ethanoic acid layer on top and water layer down.
   (B) Test tube II has water layer on top and ethanoic acid layer down.
   (C) The solutions in test tubes I and II appear similar.
   (D) Test tube II solution is turbid.
Which student has made the correct observation?
   (a) A          (b) B
   (c) C          (d) D

26. A student poured water and acetic acid in two unlabelled beakers. Later he was confused in identifying them. Which property of acetic acid can be used by him to identify it?
   (a) reaction with NaHCO₃   (b) colour
   (c) stability of the solution  (d) ability to pass light

27. Chemical name of Palm oil to prepare soap is:
   (a) Glycerol Oleate  (b) Glycerol Sterate
   (c) Glycerol Palmitate (d) None of the above

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28. In the laundry soap, the filler added to make it work even in hard water is:
   (a) Baking soda  (b) Washing soda
   (c) Baking powder  (d) Common salt

29. Ravi took a water sample and added soap to it. He observed a scum formation. He concluded that it was soft water. His friend Rahul said that the sample was hard water:
   (a) Both Ravi and Rahul were wrong
   (b) Ravi was right
   (c) both Ravi and Rahul were right
   (d) Only Rahul was right

30. A convex lens has a focal length of 12 cm. At which of the following positions should an object be placed so that this convex lens may act as a magnifying glass?
   (a) 26 cm  (b) 17 cm
   (c) 9 cm  (d) 24 cm

31. A student has to do the experiment on finding the focal length of a given convex lens by using a distant object. He can do his experiment if he is made available
   (a) a lamp and screen  (b) a scale and screen
   (c) a lamp and scale  (d) a screen

32. When Anil showed the path traced by him for a ray of light incident on a glass slab, his teacher asked him to name the angle between the refracted ray and the normal at the point of incidence. This is known as:
   (a) angle of emergence  (b) angle of incidence
   (c) angle of reflection  (d) angle of refraction

33. Four students A, B, C and D traced the path of a ray of light through a glass slab. Their diagrams were as:

   ![Diagrams](A) ![Diagrams](B) ![Diagrams](C) ![Diagrams](D)

Correct path was traced by:
   (a) A  (b) B
   (c) C  (d) D

34. Bat's wings and Cat's paw are:
   (a) Homologous organs  (b) Analogous organs
   (c) Vestigial organs  (d) None of the Above
35. A student was given two slides, one of the budding in yeast and the other of binary fission in Amoeba. He was asked to observe the nuclei of the two and record his observations. The correct observation is:

(a) presence of two distinct nuclei in Amoeba, one in yeast cell and two in the bud.
(b) presence of one nucleus in Amoeba, two in yeast and one in its bud.
(c) presence of single nucleus each in Amoeba and yeast cell and none in the attached bud.
(d) presence of two nuclei in the centrally constricted Amoeba, one in yeast cell and one in its bud.

36. Soap micelles in water will not come together to precipitate because of:

(a) ion-ion attraction between micelles
(b) ion-ion repulsion between micelles
(c) electro negativity of micelles
(d) electro positivity of micelles

37. Which of the following options is/are correct regarding the trace of the path of the rays of light through a glass prism?

(a) Refraction of light takes place when light passes from a denser to a rarer medium.
(b) Refraction of light takes place when light passes from a rarer to a denser medium.
(c) Refraction of light takes place whenever there is a change in the medium in the path of light.
(d) All the above

38. Ramesh was asked to choose the ray diagram that correctly shows the image formation by a convex lens for object placed at focus. He selected:
39. Manoj has drawn a ray diagram for image formation by a convex lens in which size of object equals the size of its real image. Manoj has drawn the diagram for object placed at:

(a) F  (b) 2F  
(c) Infinity  (d) Between F and 2F

40. Potato tuber is a modified:

(a) stem  (b) root  
(c) leaf  (d) None of these

41. In dicot seed, lower part of an embryo is called:

(a) Plumule  (b) Radicle  
(c) Hypocotyle  (d) Epicotyle

42. Micropyle occurs in:

(a) Ovary  (b) Seed  
(c) Ovule  (d) Both (b) and (c)