Time Allowed : 3 hours **Class 10, Science** **Maximum marks : 90**

(1 to 3 are 1 mark) (4 to 6 are 2 marks) (7 to 18 are 3 marks)(19 to 24 are 5 marks) (25 to 27 are 2 marks) (28 to 36 are 1 mark)

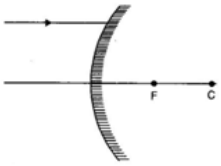
Section – A

Q.1 Name any two non-biodegradable wastes.

Q.2 Name the classes of organic compounds represented by the following formulae:

(i) $C_2H_5NH_2$ (ii) $H_3C—\overset{\overset{O}{\|}}{C}—CH_3$

Q.3 A ray of light incident on a convex mirror as shown in figure. Redraw the ray diagram after completing the path of the light ray after reflection from the mirror.



Q.4 Describe 'Total internal reflection of light'. What is the essential condition for it occurance?

Q.5 Why does Silicon have valency 4 and Chlorine 1?

Q.6 Use the mirror formula to show that an object lying between the pole and focus of a concave mirror, the image formed is always virtual in nature.

Q.7 A concave lens has the focal length of 20 cm. At what distance from the lens a 5 cm tall object be placed so that it forms an image at 15 cm from the lens? Also calculate the size of the image formed.

Q.8 (i) State Snell's law of reflection of light. (ii) A transparent medium A floats on another transparent medium B. When a ray of light travels obliquely from A into B, the reflected ray bends away from the normal. Which of the two media A and B if optically denser and why?

Q.9 What is the need for sign convention? Write them.

Q.10 What are optical fibres? Give three applications of these fibres.

Q.11 Suggest three ways to maintain a balance between environment and development to survive.

Q.12 How would you dispose the following waste:
(i) Domestic wastes like vegetable peels. (ii) Industrial wastes like metallic cans. (iii) Plastic material.

Q.13 Give three drawbacks (limitations) of Mendeleev's Periodic Table.

Q.14 A mother always wants her child to drink milk. As it is a boon for health. If one do not drink milk, he can face severe health problems. Answer the following questions on the basis of above text.
(a) Name the major constituent / nutrient present in the milk. (b)Write the chemical symbol, atomic number and valency of that nutrient. (c) What value do you infer from the given text?

Q.15 (i) Which are two main types of reproduction in living organisms?
(ii) Classify the following under these two types: Amoeba, Frog, Earthworm, Yeast

Q.16 What are the male and female gonads in human beings? State any two functions of each of them.

Q.17 Name any three organs homologous to human hand. Why are they considered homologous?

Q.18 Who was Mendel? Why was he called the "Father of Genetics"?

Q.19 (i) What is genetics? (ii) Give the common name of the plant on which Mendel performed his experiments. **Or**
(i) What are 'chromosomes'? Where are they located in the cells? (ii) What is a sex chromosome?
(iii) Explain the mechanism of sex determination in human beings.

Q.20 Draw a ray diagram to show the formation of image of an object placed between the pole and focus of a concave mirror. Obtain the relation between *u*, *v* and *f* for a given concave mirror.
State clearly the assumption involved and sign convention used. **Or**
One half of a convex les is covered with a black paper. Will this lens produce a complete image of the object? Verify your answer experimentally. Explain your observations.

Q.21 Draw a ray diagram in each case to show the position and nature of the image formed when the object is places:
(i) At the centre of curvature of a concave mirror. (ii) Between the pole P and focus F of a concave mirror.
(iii) In front of a convex mirror. (iv) At 2F of a convex lens. (v) In front of a concave lens.

Or

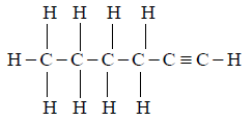
(i) During its passages from one medium to another, when does a light ray change its path? (ii) Define the term absolute refractive index of a medium. (iii) With the help of a ray diagram, explain the term 'critical angle'. (iv) What is the value of refractive index of the medium if the critical angle of incident in a denser-rarer interface is equal to 45º ?

Q.22 An organic compound A is widely used as a preservative in pickles and has a molecular formula $C_2H_4O_2$. This compound reacts with ethanol to form a sweet smelling compounds B. (i) Identify the compounds A.
(ii) Write the chemical equation for its reaction with ethanol to form compounds B.
(iii) How can we get compounds A back from B? (iv) Name the process and write corresponding chemical reaction.
(v) Which gas is produced when compounds A reacts with washing soda? Write the chemical equation.

Or

(a) Why does carbon form largest number of compounds? (b)Why are some of these are called saturated and other unsaturated compounds? (c) Which of these two is more reactive? (d)Write the names of the compounds:

(i) CH_3-CH_2-Br (ii)



Q.23 (a) Draw an electron dot structure of (i) N_2, (ii) O_2, (iii) $CaCl_2$, (iv) Na_2O
(b) Write IUPAC name of (i) CH_3COCH_3, (ii) $CH_3CH_2CH_2CHO$
(c) How will you test the presence of carboxylic acid? (d) Complete the following reaction: $CH_3CH_2OH + Na \longrightarrow$

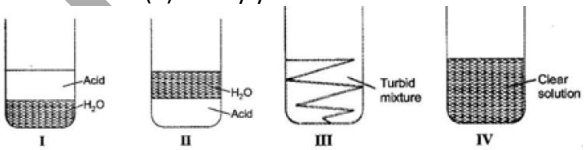
Or

(a) Give electron dot structure of (i) CO_2, (ii) H_2S, (iii) $CaCl_2$, (iv) AlF_3 (b) How will you differentiate between Ethane and Ethene by a suitable chemical test? Give chemical reactions involved.
(c) Why are detergents preferred over soaps? Give two reasons.

Q.24 Trace the events that would take place in a flower from the time the pollen grains of the same species fall on the stigma up to the completion of fertilization. **Or** Discuss briefly the different types of reproduction.

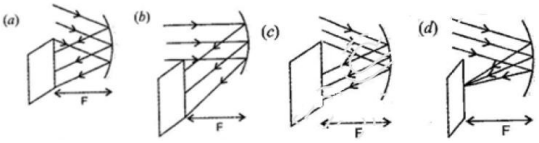
Section B

Q.25 Five mL of acetic acid was added to 5 mL of water in a test tube.
(a) The resulting mixture is correctly represented in which diagram. (b) Justify your answer.



Q.26 Which process is shown in the figure of given slides A and B? Give reason also.

Q.27 Which of the following pictures depict the correct image formation and why?



Q.28 Glacial acetic acid is: (a) 10% acetic acid (b) 50% acetic acid (c) 100% acetic acid (d) 5% acetic acid

Q.29 Acetic acid, when dissolve in water, it dissociates into ions reversely because it is:
(a) It is a weak acid. (b) It is a strong acid. (c) It is a weak base. (d) It is a strong base

Q.30 Binary fission occurs in: (a) Plasmodium (b) Hydra (c) Pomegranate (d) Paramecium

Q.31 In which of the following reproduction parental identity is lost
(a) Budding (b) Binary fission (c) Multiple fission (d) All of above

Q.32 The sex of the human child depends on the sex chromosome present in the:
(a) Egg (b) Sperm (c) Both (a) & (b) (d) None of these

Q.33. Who proposed the law of heredity: (a) Darwin (b) Mendel (c) Morgan (d) Dalton

Q34. The convex lens having surface of same radii is called as:
(a) Equi-convex lens (b) Equi-planar lens (c) Plano-convex lens (d) Water lens

Q35. If parallel beams, non-parallel to principal axis fall on the convex lens, they converge at a point:
(a) On principal axis (b) Away from principal axis (c) Centre of curvature (d) Called focus on the axis

Q36. Rajiv put the 10 g raisins in 100 mL distilled water which is at 10o C below the room temperature while Ajay put the same amount of raisins in 100 mL distilled water at 10o C above the room temperature. After an hour, percentage of water absorbed by the raisins will be: (a) Same in both cases. (b) More in Rajiv's beaker. (c) More in Ajay's beaker.(d) Exactly twice as much as in Ajay as in Rajiv' beaker.

ALL THE BEST