

General Instructions:

- (i) The question paper comprises of two sections, A and B. You are to attempt both the sections.
- (ii) All questions are compulsory.
- (iii) All questions of Section-A and B are to be attempted separately.
- (iv) There is an internal choice in two questions of three marks each and one question of five marks.
- (v) Question numbers 1 and 2 in Section-A are one mark questions. They are to be answered in one word or in one sentence.
- (vi) Question numbers 3 to 5 in Section- A are two marks questions. These are to be answered in 30 words each.
- (vii) Question numbers 6 to 15 in Section-A are three marks questions. These are to be answered in about 50 words each.
- (viii) Question numbers 16 to 21 in Section-A are 5 marks questions. These are to be answered in 70 words each.
- (ix) Question numbers 22 to 27 in Section- B are based on practical skills. Each question is a two marks question. These are to be answered in brief.

Section – A

1. What is the effect of DNA copying which is not perfectly accurate on the reproduction process? (1)
2. Give one reason why multicellular organisms require special organs for exchange of gases between their body and their environment. (1)
3. Write the homologue of each of the following:
i) CH_4 ii) C_2H_4 iii) C_4H_6 iv) $\text{C}_2\text{H}_5\text{OH}$ (2)
4. What is the cause of dispersion of white light passing through prism? Which colour of light deviates the- i) most; ii) least (2)
5. "Reuse strategy is better than recycling". Justify the statement with the help of an example. (2)
6. A coil made of insulated copper wire is connected to galvanometer. What will happen to the deflection of the galvanometer if a bar magnet is pushed into coil and then pulled out of it? Give reason for your answer and name the phenomenon involved.

OR

What is a solenoid? What are the properties of the magnetic field produced by a current carrying solenoid? How does solenoid behave like a magnet? (3)

7. a) Why are conductors of electric heating devices such as toaster and electric iron made of an alloy, rather than pure metals? (3)
b) Give two advantages of connecting electrical devices in parallel with battery. (3)
8. Differentiate between roasting and calcinations process used in metallurgy. (3)
9. Define the term decomposition reaction. Explain thermal decomposition and electrolytic decomposition with one example each. (3)
10. In single celled organisms diffusion is sufficient to meet all their requirements of food, exchange of gases or removal of wastes but it is not in case of multicellular organisms. Explain the reason for this difference.

OR

- (a) Name the site of exchange of material between the blood and surrounding cells.
(b) Draw a schematic representation of transport and exchange of oxygen and carbon dioxide in human body. (3)
11. Guinea pig having black colour when crossed with guinea pig having same colour produced 80 offspring, out of which 60 were black and 20 were white. Now, find out:
a) What is the possible genotype of the guinea pigs?
b) Which trait is dominant and which trait is recessive?
c) What is this cross called as and what is its phenotypic ratio? (3)
12. Why does a pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water? Will the pencil appear to bend to the same extent, if instead of water we use liquids like kerosene or turpentine. Support your answer with reason. (3)
13. What is meant by oxidising agent? What happens when an oxidising agent is added to propanol? Explain with the help of chemical equation.

OR

- A sanitary worker uses a white chemical having strong smell of chlorine gas to disinfect the water tank.
- i) Identify the chemical compound and write its chemical formula.
ii) Give chemical equation for its preparation.
iii) Write its two uses other than disinfection. (3)
14. How will new species arise in case:
a) two sub-populations are separated due to a huge mountain in between them?
b) A small population of individuals gets drifted away from the main land due to sea? (3)

15. Mr. R. Sharma was suffering from various types of diseases presently. He went for thorough health checkups and was diagnosed as HIV+ve. Soon this news spread in his neighbourhood and on account of this, he faced social isolation.

Comment upon:-

i. Do you think people's indifference towards HIV+ve people is justifiable?

What kind of approach should we have towards the persons suffering from AIDS.

ii. How can one protect oneself from this diseases?

(3)

16. a) Describe with diagram an experiment to show that a force is exerted on a current carrying conductor when placed perpendicular in a magnetic field.

b) Explain two factors which determine the strength of electromagnet.

(5)

17. i) Define universal indicator. For what purpose is it used?

ii) Two solutions A and B have pH values of 3.0 and 9.5 respectively. Which of these will turn blue litmus solution to red? Which will turn phenolphthalein from colourless to pink?

iii) What colour will you get when you add a few drops of universal indicator to a test tube containing distilled water.

OR

a) Explain the term "rancidity."

b) Name the type of chemical reaction responsible for causing rancidity and define it.

c) Write three methods for preventing rancidity of food.

(5)

18. i) (a) "The breathing cycle is rhythmic whereas exchange of gases is a continuous process". Justify this statement.

(b) What happens if a conducting tube of the circulatory system develops a leak? State in brief, how could this be avoided?

(c) How does the opening and closing of stomata take place?

ii) What are enzymes? Name any one enzyme of our digestive system and write its function.

(5)

19. a) Describe the formation of a rainbow in the sky with the help of a diagram.

b) A person suffering from short-sightedness can see clearly only up to a distance of 2 meters.

Find the nature and power of the lens required to correct his vision.

(5)

20. An element X of group 15 exists as a diatomic molecule and combines with hydrogen at 773 K in the presence of a catalyst to form a compound, ammonia, which has a characteristic pungent smell.

a) Identify the element X. How many valence electrons does it have?

- b) Draw the electron dot structure of the diatomic molecule of X. What type of bond is formed in it?
- c) Draw the electron dot structure for ammonia and write the type of bond formed in it. (5)
21. a) How is energy generated in a nuclear fission reaction? Why is the large scale use of nuclear energy prohibitive?
- b) "Biogas is considered to be a boon to the farmers." Justify this statement. (5)

Section B

22. On adding a drop of barium chloride solution to an aqueous solution of sodium sulphate a white precipitate is obtained.
- a) Write the balanced chemical equation of the reaction involved.
- b) What other name can be given to this precipitation reaction? Why? (2)
23. Name the gas evolved when baking soda is treated with dilute HCl. How will you test this gas? (2)
24. A student observed a permanent slide showing asexual reproduction in amoeba. Draw diagrams of the observations he must have made from the slide. Name the process also. (2)
25. List two precautions that he/she must take while preparing a temporary mount of a leaf peel to observe stomata. (2)
26. A ray of light strikes at an angle of incidence of 60° on an equilateral prism. When the angle of deviation is 45° , calculate the angle of emergence. (2)
27. Two resistors of $3\ \Omega$ and $6\ \Omega$ are connected in parallel circuit. If the magnitude of current in $3\ \Omega$ resistor is $2\ \text{A}$, what is the magnitude of the current flowing through $6\ \Omega$ resistor? What is the total current in the circuit?.

OR

In a electric circuit, $5\ \Omega$ resistor is connected to $10\ \Omega$ resistor in series with an ammeter and a cell. The ammeter shows a reading of $0.2\ \text{A}$. What is the magnitude of current in $5\ \Omega$ and $10\ \Omega$ resistor? Give reason for your answer. (2)