

**General Instructions:**

- (i) The question paper comprises 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 three questions of three marks each and one question of five marks.
- (v) Question numbers 1 and 2 in Section-A are one mark question. 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 five 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. Mention any two abiotic factors that affect crop production. (1)
2. Arrange the following steps in order of their sequence of occurrence in nitrogen cycle starting from nitrogen gas.  
Ammonification, Nitrification, Denitrification, Nitrogen fixation. (1)
3. a) In the notation of nitrogen  $^{14}_7\text{N}$ , what do the numbers 14 and 7 denote?  
b) Identify the pair of isotopes from the following:  $^{16}_8\text{X}$ ,  $^{16}_7\text{X}$ ,  $^{18}_8\text{X}$ . (2)
4. Which will exert more pressure 100kg mass on  $10\text{m}^2$  or 50kg on  $4\text{m}^2$ ? (2)
5. Give scientific reason for the following.  
a) Inner membrane of mitochondria is deeply folded.  
b) Plasma membrane is called selectively permeable membrane (2)
6. a) Define SI unit of force.  
b) Find the acceleration produced by a force of 12N exerted on an object of mass 3 kg.

OR

- a) Define Newton's third law of motion.  
 b) A runner presses the ground with his feet before he starts his run. Identify the action and reaction in this situation. (3)
7. a) What keeps the Moon in uniform circular motion around the Earth?  
 b) Why do astronauts in space feel weightless?  
 c) State the universal law of gravitation. Write mathematical expression for universal gravitational constant. (3)
8. a) Define formula unit mass.  
 b) Calculate the number of moles in 17 g of  $H_2O_2$ . ( At. mass of H = 1 u, O = 16 u) (3)
9. a) What is cation? Give one example.  
 b) Write the chemical formula of the following compounds  
 i. Iron (III) Chloride  
 ii. Calcium carbonate (3)
10. Differentiate between monocotyledon and dicotyledon.

OR

Identify the class of animal having the following characteristic features and give one example each.

- a. The warm blooded animal that lay eggs and have four chambered heart and a covering of feather.  
 b. The cold blooded animals having scales and they breathe through lungs.  
 c. The animals that can live on land as well as in water. (3)
11. a) Write the principle of treatment that are generally followed by a doctor to treat infectious diseases.  
 b) Explain any two modes of transmission of infectious diseases. (3)
12. A body of mass 5kg is thrown vertically upwards with a speed of 10m/s. What is its kinetic energy when it is thrown? Find its potential energy when it reaches at the highest point. Also find the maximum height attained by the body. ( $g=10m/s$ ) (3)
13. State the principle of each of the following methods of separation of mixtures:  
 a) Separation using separating funnel.  
 b) Centrifugation method.  
 c) Fractional distillation (3)
14. Draw the schematic diagram of plant cell. Label the following parts and write one function of each.  
 a. Cell wall      b. Mitochondria      c. Vacuole      d. Nucleus. (3)

15. Rahul and Rachana were practising floriculture in their farm. They sold the flower to florist in India. They felt that if they started bee keeping, their income would increase. They obtained more information from the local officer.

- What is pasturage? How is it related to quality of honey?
- Name a bee variety which is commonly used for commercial honey production.
- Why would society appreciate Rahul and Rachana? (3)

16. a) A cyclist moving along a circular path of radius 63m completes three rounds in 3 minutes. Calculate:

- The total distance covered by him during this time.
- Net displacement of the cyclist.
- The speed of the cyclist.

b) Define circular motion. What is the difference between uniform motion in a straight line and circular motion? (5)

17. The description of atomic particles of two elements X and Y is given below:

	X	Y
Protons	8	8
Neutrons	8	9
Electrons	8	8

- What is the atomic number of Y?
- What is the mass number of X?
- What is the relation between X and Y?
- Which element do they represent?
- Write the electronic configuration of X.

Write the cation or anion formed by the element.

**OR**

- What are isobars? Give one example.
- Write two differences between isobars and isotopes.
- Write any two uses of isotopes. (5)

18. a) Draw a well labelled diagram of meristematic tissue in plant body. Mention the location and function of each meristematic tissue.

- b) Mention one function of each of the following
- Adipose tissue
  - Tendon
  - Ligament
  - Cardiac muscle. (5)

19. a) Describe an activity to show that sound does not travel in vacuum.
- b) Define power. State its SI unit. An electric bulb of 100 W is used for 6 hours per day. Calculate the units of electrical energy consumed in one day by the bulb. (5)
20. a) Distinguish between solids and gases on the basis of following parameters:  
i) Interparticle distance ii) Interparticle forces of attraction iii) Compressibility
- b) Give two factors that determine the rate of evaporation. (5)
21. a) How does air pollution affect the living being on the Earth.
- b) What are the two forms of oxygen found in atmosphere? What is their importance.
- c) Explain any two causes of soil erosion. (5)

### Section B

22. a) Is there a change in mass when a chemical reaction takes place?  
b) Is law of conservation of mass obeyed in all types of chemical reactions? (2)
23. How are solution, suspension and colloid different from each other in terms of transparency and scattering beam of light? Explain in tabular form. (2)
24. a) State the function performed by parenchyma and sclerenchyma tissue.  
b) Mention two identification features of smooth muscle. (2)
25. Draw a well labelled diagram of bony fish. Which adaptation in fish helps it to swim in water. (2)
26. In the experiment, to verify the laws of reflection of sound, the tube facing the clock makes an angle equal to  $40^\circ$  with the reflecting surface. What will be the position of the second tube with respect to the normal, at which the ear will get the best reflected sound?

**OR** (2)

The density of aluminium is  $2700\text{kgm}^{-3}$ , what does it mean? Calculate the density of aluminium in CGS system.

27. Write the difference between transverse wave and longitudinal wave. (2)