

**Time: 3 hrs****Total Marks: 80****General Instructions:**

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

**SECTION – A**

- 1. Mention the various methods of inter-crop hybridisation. [1]
- 2. Which type of farming system yields healthier grains? [1]

**SECTION – B**

- 3. Why does air pollution increase during winter? [2]

**OR**

Explain how air moves over sea and land during day and night.

- 4. Mention the elements and the ratio by mass of elements present in: [2]
  - a. Ammonia
  - b. Carbon dioxide

5. Identify the energy involved in the following activities. [2]
- Winding a key in a toy
  - A running fast bowler
  - A falling apple
  - A stretched bow

### SECTION – C

6. Differentiate between the following: [3]
- Acceleration due to gravity and gravitational force
  - Buoyancy and upthrust

7. Explain any two methods of biological manuring. [3]

**OR**

Explain cross-breeding of cattle with an example.

8. Mention the rules to be followed according to Bohr and Bury's atomic model for writing the number of electrons in each orbital shell. [3]

9. Give reasons: [3]
- Tides rising above the surface level of the sea
  - Satellites can circle in a circular orbit
  - A concert hall's ceiling is mostly curved.

10. Explain how the second law of motion influences a cricket fielder while catching a ball. [3]

11. Calculate the potential energy of an object at rest weighing 5 kg when placed at a height of 5 m above the level of the ground. Given gravitational constant  $g = 9.8 \text{ ms}^{-2}$ . [3]

**OR**

A 40 W tube light is used for 8 hr/day. Find how much units of energy is consumed by the tube light in one day?

12. Calculate the mass of 0.125 mol NaOH. [3]

**OR**

Write the chemical formula of the substances formed:

- a. Ammonium dichromate
- b. Aluminium sulphate
- c. Calcium phosphate
- d. Iron (III) oxide

13.

[3]

- a. Define cellular diffusion
- b. Name any two elements that are transported through cellular diffusion
- c. Mention any two benefits of cellular diffusion

14. Explain the action of the antibiotic penicillin in disease prevention.

[3]

15. Although there is huge increase in carbon dioxide production by various human activities, the atmospheric carbon dioxide level is amounted in small quantities like around 409 parts per million. Explain the situation and its consequences.

[3]

### **SECTION – D**

16.

[5]

- a. Define the term with an example:
  - i. Symbiosis
  - ii. Parasitism
  - iii. Autotrophs
- b. Identify the plant group with:
  - i. Stems and leaves but with hidden reproductive organs
  - ii. Stems and leaves but with no vascular system for conduction

17.

[5]

- a. Calculate the acceleration required to push a box weighing 3.5 kg with 2 N of force.
- b. A crate weighing 45 kg was pushed on the floor to about 15 m with a force of 20 N. Calculate the work done.

**OR**

- a. There is a change in velocity observed from 10 m/s to 15 m/s when a force of 300 N is applied on a body. Calculate the mass of the body?
- b. What would be the force required to accelerate the speed of a vehicle weighing 1500 kg and moving at a speed of 10 ms<sup>-2</sup>?

18. Explain saturation and solubility of a solution.

[5]

**OR**

- a. How do isotopes differ from isobars?
- b. Mention two medicinal uses of isotopes
- c. Represent the atomic number and mass number of isotopes of chlorine and carbon

19.

[5]

- a. What should be the distance from the cliff if a person needs to hear the echo of his voice after 5 s, provided speed of the sound is  $345 \text{ ms}^{-1}$ .
- b. What would be the velocity of a wave with frequency of 20 Hz and wavelength of 20 m? Mention if the frequency of the sound will be audible here?

20.

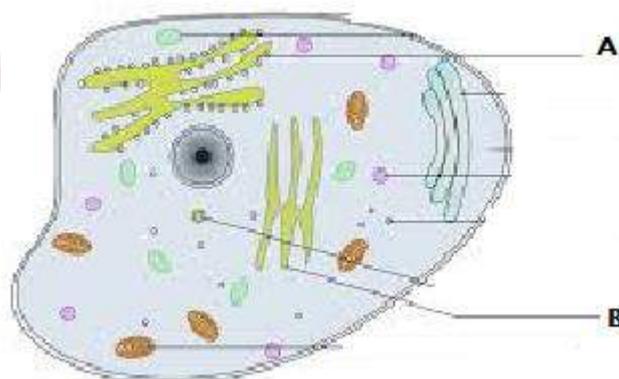
[5]

a) Mention the function of the following cell organelles:

- i. Golgi apparatus
- ii Mitochondria

b) i. Identify the cell organelles named A and B in the following animal cell diagram.

- ii. Differentiate between A and B
- iii. Mention one function of each A and B



**OR**

a)

- i. Draw a neat labeled diagram of a prokaryotic cell
- ii. Explain how prokaryotes differ from eukaryotes with respect to cell division

b) i. Draw a neat labeled diagram of a phloem cell.

- ii. Name the phloem cell that is tubular in structure

21. The canopy of a forest and milk, both exhibit Tyndall effect, but sugar solution does not. Explain why.

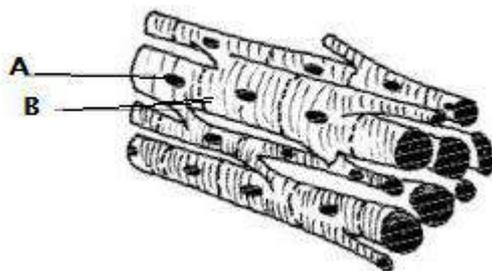
[5]

## SECTION – E

22.

[2]

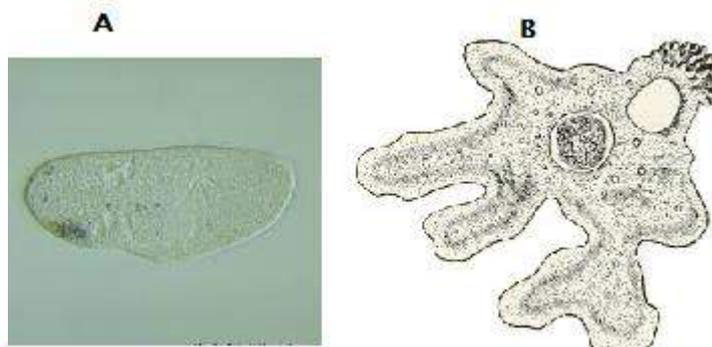
- Identify the following diagram and label the parts A and B.
- What type of muscle cell is this?



23.

[2]

- Identify the two organisms as seen under a microscope
- Name the phylum to which they belong and mention one of its features.



24.

[2]

When 4.5 g of sodium carbonate reacts with 5 g of acetic acid, the products formed are 6.5 g of sodium acetate, 0.6 g of water, and 2.4 g of carbon dioxide. Mention the law which this reaction abides and explain how?

**OR**

Identify the pure substances and mixtures:

- Tin
- Ice
- Carbon dioxide
- Milk

25. Provide a balanced equation for the reaction between lead nitrate and sodium chloride.

[2]

26. Two bodies A and B weigh 2 kg each. When the body A was dropped into a container containing water, it displaced an equal amount of weight of water.

Similarly, when body B was dropped into the container, it displaced more than its weight of water. Which of the two bodies will sink and which will float and explain why? [2]

27. When a true solution of sugar was formed what would be its transparency and stability properties? [2]

**OR**

While separating two immiscible liquid with oil and water, what would be observations?

