

General Instructions:

- i) This question paper consists of 39 questions in 5 sections.
- ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii) Section A consists of 20 objective type questions carrying 01 mark each.
- iv) Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- v) Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- vi) Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
- vii) Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION – A**Multiple Choice Questions**

1. Which of the following processes require heating? 1
 i) Fusion ii) Condensation iii) Boiling iv) Freezing
 A) (i) and (ii) B) (ii) and (iii) C) (iii) and (iv) D) (i) and (iii)
2. The boiling point of liquid nitrogen is -196°C . This temperature on the Kelvin scale will be equal to 1
 A) 77 K B) 87 K C) 90 K D) 107 K
3. The pair of solutions which show Tyndall Effect is 1
 A) Starch, Milk
 B) Starch, sodium chloride solution
 C) Sodium Chloride solution, Copper Sulphate Solution
 D) Milk and Sugar Solution
4. Select the correct statement. 1
 A) Conversion of milk into curd is a physical change
 B) Burning of Magnesium Ribbon is a chemical change
 C) Breaking down of water into hydrogen and oxygen gases on passing electric current is a physical change
 D) Dry Ice kept exposed to air is a chemical change
5. Which of the following elements is represented as 'Ag'? 1
 A) Argon B) Arsenic C) Silver D) Gold
6. The molecules of which of the following elements is polyatomic? 1
 A) Helium B) Iron C) Carbon D) Sulphur
7. The correct electronic configuration of Aluminium is 1
 A) 2, 3, 8 B) 8, 2, 3 C) 2, 8, 3 D) 8, 3, 2
8. Meristematic tissues in plants are 1
 A) localized & permanent B) not limited to certain regions
 C) localized & dividing cells D) growing in volume
9. Nervous tissue is not found in 1
 A) Brain B) Spinal cord C) Tendons D) Nerves
10. Which of the following is not a protein yielding crop? 1
 A) Gram B) Pigeon pea C) Soya bean D) Rice
11. Identify the surface feeder fish in the composite fish culture 1
 A) Rohu B) Mrigals C) Common carps D) Catlas
12. Cell theory was given by 1
 A) Virchow B) Hooke C) Haeckel D) Schleiden & Schwann
13. The undefined nuclear region of prokaryotes is also known as 1
 A) Nucleus B) Nucleolus C) Nucleic acid D) Nucleoid

14. Plasmolysis in a plant cell is defined as 1
 A) breakdown of plasma membrane in hypotonic medium
 B) shrinkage of cytoplasm in hypertonic medium
 C) shrinkage of nucleoplasm
 D) None of the above
15. Sound waves are called mechanical waves because 1
 A) These waves can travel without any medium.
 B) These waves can travel with or without any medium.
 C) These waves can travel only through a medium.
 D) These waves can travel through vacuum.
16. Which of the following represents the correct formula for power? 1
 A) Energy/ time B) Work done/ time C) Energy x time D) Both A and B

Reason Assertion Questions:

Questions 17 to 20 are reason assertion based questions. These consists of two statements- **Assertion (A)** and **Reason (R)**. Answer these questions selecting the appropriate option given below:

- A) Both A and R are true and R is the correct explanation of A.
 B) Both A and R are true and R is not the correct explanation of A.
 C) A is true but R is false.
 D) A is false but R is true.
17. Assertion (A): Temperature remains constant during change of state of matter.
 Reason (R): The heat energy supplied is used up in overcoming the force of attraction between the particles. 1
18. Assertion (A): Parenchyma cells help in storage of food.
 Reason (R): Parenchyma cell are the main site of photosynthesis. 1
19. Assertion (A): Cattle are fed with roughage & concentrates.
 Reason (R): Roughage provides fibres while concentrates provide proteins & other nutrients. 1
20. Assertion (A): Action and reaction forces are equal and produce equal accelerations.
 Reason (R): Each force acts on different objects that may have a different mass. 1

SECTION – B

Questions 21 – 26 are Very Short Answer Questions

21. a) Why does a gas fill a vessel completely?
 b) What type of clothes should be worn in summer and why? 2
22. Differentiate between manure & fertilizers. (Any 2 points) 2
23. What is the role of epidermis in plants? (2 functions) 2
24. A person consumes concentrated solution of salt. After some time he starts vomiting.
 What is the phenomenon responsible for such situation? 2
 (OR)
 a) How is bacterial cell different from onion peel cell? (Any one point)
 b) Why is mitochondria known as powerhouse of the cell? 2
25. a) Differentiate between uniform and non- uniform motion.
 b) List any two ways by which velocity of a moving object can be changed. 2
 (OR)
 a) Define the following terms:
 i) Average velocity
 ii) Uniformly accelerated motion
 b) A Bicycle starts from a stationary position and attains a velocity of 6 m/s in 30 s.
 Calculate the acceleration of the bicycle. 2
26. a) Define acceleration due to gravity.
 b) Mathematically derive the relationship between g and G. 2

SECTION – C

Questions 27- 33 are Short Answer Questions

27. a) Is it possible for an atom to have one electron, one proton, and no neutron? If yes, name the element.
 b) Will ^{35}Cl and ^{37}Cl have different valencies? Justify your answer.

- c) Calculate the number of neutrons present in the nucleus of an element whose atomic number is 15 and mass number is 31. 3
- (OR)
- a) What are the limitations of Thomson's Model of an atom?
b) Find the number of electrons in different shells according to the Bohr-Bury scheme. 3
28. a) Give two reasons to support the statement 'water is a compound and not a mixture'.
b) Differentiate between a saturated solution and an unsaturated solution. (one point) 3
29. Differentiate between striated, unstriated & cardiac muscles on the basis of their structure and location. Diagram is must. 3
30. a) List any 2 management practices to be considered while designing a shelter for cattle?
b) What are weeds? Give one example in support of your answer. 3
31. a) A train is travelling at a speed of 90 km/h. The brakes are applied so as to produce a uniform acceleration of -0.5 m/s^2 . Find how far the train will go before it is brought to rest.
b) A car is being driven along a straight road for testing its engine. The velocity of the car is recorded after every 5 s by noting the reading of the speedometer of the car. Plot the velocity-time graph. Also find the distance travelled by the object between 10 s and 25 s. 3

Time (s)	0	5	10	15	20	25	30
Velocity (km/h)	0	9	18	27	36	45	54

32. a) An object of mass 1000 kg is accelerated uniformly from a velocity of 5 m/s to 8 m/s in 6s. Calculate the change in momentum of the object.
b) Give reasons for the following:
i) It is advisable to tie the luggage kept on the roof of a bus with a rope.
ii) A karate player breaks a slab of ice with a single blow. 3
33. a) Give any two importance of universal law of gravitation.
b) If the mass of an object is 7.5 kg on earth, what will be its weight on the moon?
c) State Archimedes principle. 3

SECTION – D

Questions 34 - 36 are Long Answer Questions

34. a) State the law of constant proportion. Which postulate of Dalton's atomic theory explains this law?
b) Write the chemical formula of Ammonium Phosphate.
c) A 14 g sample of a compound XY contains 3.5 g of element X and 10.5 g of element Y. Calculate the percentage composition of the compound by mass. 5
- (OR)
- a) Why is it not possible to see an atom with naked eyes?
b) Calculate the molecular mass of potassium chlorate (KClO_3). [The atomic masses of the constituent elements are K = 39 u, Cl = 35.5 u, O = 16 u.]
c) Define relative atomic mass of an atom.
d) Give two examples of elements showing variable valencies. Write their valencies also. 5
35. a) Differentiate between mixed cropping & intercropping. Give one e.g. of each. (2 points)
b) What are macro & micro nutrients?
c) Name one exotic & one indigenous variety of poultry birds. 5
- (OR)
- a) List 3 factors for which the variety improvement of crops is aimed at?
b) What is pasturage?
c) Give two advantages of crop rotation. 5
36. a) Give an example from daily life where work done is zero even when the force and displacement are not zero.
b) Derive the mathematical expression for kinetic energy of a moving object.
c) What is the amount of work done to increase the velocity of a car from 36 km/h to 72 km/h if the mass of the car is 1500 kg. 5
- (OR)

- a) State the law of conservation of energy.
- b) Define potential energy. Derive its mathematical expression.
- c) An object of mass 40 kg is raised to a height of 5 m above the ground. What is its potential energy? If the object is allowed to fall, find its kinetic energy when it is half-way down.

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SECTION – E

Questions 37 - 39 are Source/Data /Case Based Questions with 4 short sub parts.
Internal choice is provided in one of the sub parts.

37. Read the passage given below and answer the questions that follow: 4

Ernest Rutherford designed an experiment to know the arrangement of electrons within an atom. In this experiment, fast moving alpha particles (doubly- charged helium ions) were made to fall on a thin gold foil. He selected a gold foil because he wanted as thin a layer as possible. The fast moving alpha particles have a considerable amount of energy. It was expected that alpha particles would be deflected by the subatomic particles in gold atoms. But, the alpha particle scattering the experiment gave totally unexpected results.

- i) Most of the alpha particles passed straight through the gold foil.
- ii) Some of the alpha particles were deflected by small angles.
- iii) Surprisingly one out of every 12000 particles appeared to rebound.

- 37.1 What is the charge on alpha particles?
- 37.2 Why did Rutherford expect alpha particles to deflect by the subatomic particles in the gold atoms?
- 37.3 How many alpha particles appeared to rebound? What happened to most of the alpha particles in this experiment?

(OR)

- 37.3 Why did he choose gold foil for his experiment? The results of Rutherford's experiments led to a major discovery. What was this discovery?

38. Read the passage given below and answer the questions that follow: 4

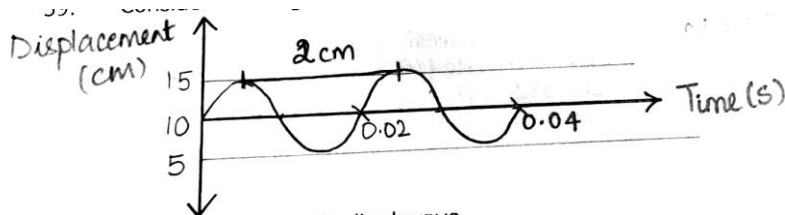
Bone is another example of a connective tissue. It forms the framework that supports the body. It also anchors the muscles and supports the main organs of the body. It is a strong and nonflexible tissue. Bone cells are embedded in a hard matrix that is composed of calcium and phosphorus compounds. Two bones can be connected to each other by another type of connective tissue called the ligament. This tissue is very elastic. It has considerable strength. Ligaments contain very little matrix and connect bones with bones. Tendons connect muscles to bones and are another type of connective tissue. Tendons are fibrous tissue with great strength but limited flexibility.

- 38.1 Give composition of bone.
- 38.2 What does tendon connect?
- 38.3 A person met with an accident in which two long bones of the hand dislocated. What could be the reason?

(OR)

- 38.3 Give two functions of bone.

39. Consider the longitudinal wave given below and answer the questions that follow. 4



- 39.1 Define longitudinal wave.
- 39.2 Write the relationship between frequency and time period of an oscillation.
- 39.3 Calculate the following for the wave given above:
- i) amplitude of oscillation
 - ii) frequency of oscillation

(OR)

- 39.3 Calculate the following for the wave given above:
- i) wavelength of oscillation
 - ii) speed of the wave