

# PT4/ANNUAL EXAMINATION, 2022-23

## SCIENCE

Time - 3 hrs.

Class – IX (Set-B)

M.M. – 80

Name of the student \_\_\_\_\_ Section \_\_\_\_\_ Date - 17.02.2023 (Friday)

### **GENERAL INSTRUCTIONS :**

- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- **Section A** consists of objective type questions carrying 1 mark each.
- **Section B** consists of Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- **Section C** consists of Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- **Section D** consists of Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
- **Section E** consists of source-based/case-based units of assessment of 04 marks each with sub-parts.

### **SECTION -A**

- Q.1 Newton's First Law of Motion is also called: (1)  
a) Law of Friction      b) Law of Reaction      c) Law of Action      d) Law of Inertia
- Q.2 Which of the following, works on the principle of conservation of linear momentum? (1)  
a) A gun recoils after firing      b) Rocket  
c) The case of hose pipe      d) All the above
- Q.3 The value of acceleration due to gravity (1)  
a) is same on equator and pole?      b) is least on poles  
c) is least on equator      d) increases from pole to equator
- Q.4 Which one of the followings is not the unit of energy? (1)  
a) Joule      b) Newton meter      c) Kilowatt      d) Kilowatt-hour (kwh)
- Q.5 When the vibrating object moves backward, it creates a region of low pressure called (1)  
a) Refraction      b) Reflection      c) Rarefaction      d) Retardation
- Q.6 Which condition out of the following will increase the evaporation of water? (1)  
a) Increase in temperature of water.      b) Decrease in temperature of water.  
c) Less exposed surface area of water.      d) Adding common salt in water.
- Q.7 A mixture of iron and carbon disulphide is- (1)  
a) Heterogenous and shows Tyndall effect.  
b) Homogeneous and shows Tyndall effect.  
c) Heterogeneous and does not show Tyndall effect.  
d) Homogeneous and does not show Tyndall effect.

- Q.8 Which of the following properties does not describe a compound? (1)
- a) It is composed of two or more elements
  - b) It is a pure substance.
  - c) It cannot be separated into constituents by physical means
  - d) It is mixed in any proportion by mass

- Q.9 What is the statement? (1)
- “10 percent glucose in water by mass” signifies.
- a) 10 grams of glucose dissolved in 100 grams of water.
  - b) 10 grams of glucose dissolved in 90 grams of water.
  - c) 20 grams of glucose dissolved in 200 grams of water.
  - d) 20 grams of glucose dissolved in 90 grams of water.

- Q.10 Two chemical species X & Y combine together to form a product P which contains both X and Y,  $X+Y \rightarrow P$ , X & Y cannot be broken down into simpler substances by simple chemical reactions. Which of the following concerning the species X, Y and P are correct? (1)
- i) P is a compound.
  - ii) X and Y are compounds.
  - iii) X and Y are elements.
  - iv) P has a fixed composition.

The correct option is-

- a) (i), (ii) and (iii)
  - b) (i), (ii) and (iv)
  - c) (ii), (iii) and (iv)
  - d) (i), (iii) and (iv)
- Q.11 Which of the following is an alloy ? (1)
- a) Silicon
  - b) Brass
  - c) Copper
  - d) Mercury

- Q.12 The process by which water moves through a semi-permeable membrane from a region of higher concentration to a region of lower concentration, thereby equalizing water concentration is called: (1)
- a) Evaporation
  - b) Diffusion
  - c) Osmosis
  - d) All of these

- Q.13 Cells of Cork tissue contain heavy deposition of a chemical called ----- which makes it impervious to water. (1)
- a) Pectin
  - b) Lignin
  - c) Suberin
  - d) Cellulose

- Q.14 \_\_\_\_\_ is not found in xylem tissue. (1)
- a) Sieve tube
  - b) Xylem parenchyma
  - c) Tracheid
  - d) Vessel

- Q.15 The revolution associated with increased food grain production is- (1)
- a) White revolution
  - b) Green revolution
  - c) Silver revolution
  - d) Blue revolution.

- Q.16 Rice is a \_\_\_\_\_ crop. (1)
- a) Rabi
  - b) Kharif
  - c) Zaid
  - d) None of these

**Directions:** In the following question nos. 17 to 20, a statement of Assertion is given, and a corresponding statement of Reason is given just below it. Of the statements, given below, mark the correct answer as:

- a) Both assertion and reason are true and reason is the correct explanation of assertion.
- b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- c) Assertion is true but reason is false.

d) Both Assertion and Reason are false.

Q.17 **Assertion** : Universal gravitational constant G is a scalar quantity. (1)

**Reason** : The value of G is same throughout the universe.

Q.18 **Assertion**- Carbonates are polyatomic ions. (1)

**Reason** – The carbonate ion consists of one carbon atom and three oxygen atom and carries an overall charge -2.

Q19. **Assertion** : A cell swells up when present in a hypotonic solution. (1)

**Reason** : More water molecules enter the cell than they leave.

Q20 **Assertion** : Collenchyma forms the hypodermis of dicotyledonous stems. (1)

**Reason** : This is the reason of flexibility of dicotyledonous stems.

### **SECTION -B**

Q.21 How much net force is required to accelerate a 1000 kg car at 4 m/s<sup>2</sup>? (2)

**OR**

If you apply a force of 3 N on an object of mass 0.1 kg, what will be the acceleration produced?

Q.22 Smoke and fog both are aerosols. In what way are they different? (1+1)

**OR**

a) When 3.0 g of carbon is burnt in 8.00 g oxygen, 11.00 g of carbon dioxide is produced. What mass of carbon dioxide will be formed when 3.00 g of carbon is burnt in 50.00 g of oxygen? Which law of chemical combination will govern your answer?

b) Write the chemical formulae of the following:

a) Magnesium chloride

b) Calcium oxide

Q.23 a) Four samples of water are collected from different sources. Each sample on analysis was found to contain same percent of oxygen. Which law of chemical combination is demonstrated by above observation? (1)

b) Write the chemical formula of baking soda and find out the ratio of mass of the combining elements in it. (1)

Q.24 Name the cell found in Adipose tissue. Write any two functions of Adipose tissue. (2)

Q.25 Why does lotus plant floats on water? (2)

Q.26 a) What is Apiary?

b) Name one indigenous breed and one exotic breed of honeybee used for commercial honey production. (2)

**OR**

Differentiate between Compost and Vermicompost.

### **SECTION -C**

Q.27 a) Define thrust. (1+1+1)

b) How is pressure on an object related to the area?

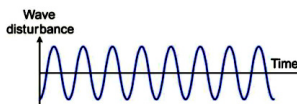
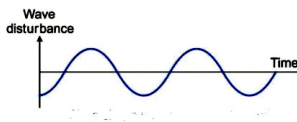
c) Why are the concrete slabs put under the rail tracks? Explain.

- Q.28 a) What is the work done by the force of gravity on a satellite moving in its orbit? Explain.  
 b) What is the work done by a man holding a bundle of hay over his head? Explain. (3)

**OR**

Four men lift a 250 kg box to a height of 1 m and hold it without raising or lowering it.

- a) How much work is done by the men in lifting the box?  
 b) How much work do they do in just holding it?
- Q.29 a) Which of the following graphs represent high pitch sound? (1+2)

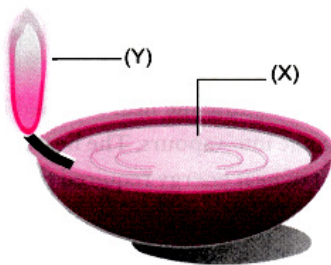


- b) Which wave property determines a) loudness, b) pitch?

- Q.30 a) From the symbol  ${}_{16}^{32}\text{S}$  state- (1.5)  
 i) Atomic number of sulphur. ii) Mass number of sulphur.  
 iii) Electronic configuration of sulphur.

- b) Which of the two elements given below would be chemically more reactive, 'X' of atomic number 18 or element 'Z' of atomic number 16 and why. (1.5)

Q31. The diagram below shows burning of an oil lamp.



- (i) Draw the arrangement of particles of position 'X' and 'Y' when the lamp is burning (1)  
 (ii) State a difference between X and Y based on compressibility. (1)  
 (iii) Name the process when state of X changes to Y. (1)

Q.32 Draw a eukaryotic nucleus and label the major parts of it. (3)

Q.33 Briefly explain three different methods of weed control. (3)

**OR**

What do you mean by micronutrients and macronutrients of plants? Name any four macronutrients.

### **SECTION – D**

- Q.34 a) Calculate the kinetic energy of a car of mass 500 kg moving with velocity 36 km/hr. What will be the new kinetic energy if two persons each of mass 50 kg enters the car and the car moves with same velocity? (3)

- b) Define power. (1)
- c)  $1\text{kW} = \dots\dots \text{J/s}$  (1)
- Q.35 a) An atom of an element has two electrons in outermost M- shell. State its (3)
- i) Electronic configuration. ii) Atomic number
- iii) Whether metal or non-metal iv) Valency.
- v) Forms cation or Anion.
- vi) Mass number of the atom if number of neutron is 12.
- b) Which two sub-atomic particles are equal in number in a neutral atom? (1)
- c) Draw a sketch of Bohr's atomic model. (1)

**OR**

- a) An element 'A' has valency +3, while another element 'B' has valency -2. Give the formula of their compound formed when 'A' reacts with 'B'. (1)
- b) The atomic number of calcium and argon are 20 and 18 respectively, but the mass number of both these elements is 40. What is the name given to such a pair of elements? (1)
- c) Write the electronic configuration of a positively charged sodium ion. Atomic number of sodium is 11. (1)
- d) Why do helium, neon and argon have a zero valency? (1)
- e) Name the scientist who performed goldfoil experiment. (1)
- Q.36 a) What is organic farming? Write any two methods of practicing organic farming.
- b) What are bio fertilisers? Give one example. (3+2)

**OR**

- a) What is composite fish culture? Explain its advantage with the help of a suitable example of fishes.
- b) How is the practice of induced fish breeding helpful to the fish farmers? Write any two points. (3+2)

### **SECTION -E (Case Based questions)**

Q.37 Sound is produced by vibrating objects. The matter or substance through which sound is transmitted is called a medium. It can be solid, liquid or gas. Sound moves through a medium from the point of generation to the listener. When an object vibrates, it sets the particles of the medium around it vibrating. The particles do not travel all the way from the vibrating object to the ear. Sound waves are characterized by the motion of particles in the medium and are called mechanical waves. When a vibrating object moves forward, it pushes and compresses the air in front of it creating a region of high pressure; this region is called a compression (c). When the vibrating object moves backwards, it creates a region of low pressure called rarefaction (R). Hence sound is longitudinal wave.

There is also another type of wave, called a transverse wave. In a transverse wave particles do not oscillate along the direction of wave propagation but oscillate up and down about their mean position as the wave travels. Thus, a transverse wave is the one in which the individual particles of the medium move about their mean positions in a direction perpendicular to the direction of wave propagation. Transverse wave can also propagate without any medium.

- a) What is the region of high pressure called in the propagation of sound? (1)

- b) Define wavelength. (1)  
c) How do you hear the sound produced by the school bell? (2)

**OR**

c) Which one between a transverse and a longitudinal wave is mechanical wave? Explain your answer in connection to the above context.

Q.38 J. J. Thomson (1856-1940) was a British physicist; He was awarded the Nobel Prize in Physics for his work on the discovery of electrons. Thomson proposed the model of an atom to be similar to that of a Christmas pudding. The electrons, in a sphere of positive charge. We can also think of a watermelon, the positive charge in the atom is spread all over like the red edible part of the watermelon, while the electrons are studded in the positively charged sphere, like the seeds in the watermelon. Thomson proposed that: An atom consists of a positively charged sphere and the electrons are embedded in it. The negative and positive charges are equal in magnitude. So, the atom as a whole is electrically neutral.

- a) Which postulate of Dalton's atomic theory obeys first law of conservation of mass? (1)  
b) Who was the first to propose atomic theory? (1)  
c) Composition of the nuclei of two atomic species 'X' and 'Y' are given below: (2)

	X	Y
Protons	8	8
Neutrons	8	10

Give the mass number of 'X' and 'Y'. What is the relationship between the two species?

**OR**

c) Write electronic configuration of Aluminium and Aluminium ion.

Q.39 Connective tissue is specialized to connect various body parts with each other. For e.g. it connects two or more bones to each other, muscles to bones, binds different tissues together and also gives support to various parts of the body. The cells of connective tissues are loosely packed, living and embedded in an intercellular matrix that may be jelly-like, fluid, dense or rigid in nature. The nature of matrix differs in accordance with the function of the particular connective tissue. Various types of connective tissue are – blood, bone, ligament, tendons, cartilage, areolar tissue, adipose tissue.

- a) Write two structural features of connective tissue common in all connective tissues. (1)  
b) Name one connective tissue having liquid matrix. (1)  
c) Write any two differences between ligament and tendon. (2)

**OR**

c) Write any two differences between Bone and cartilage.

