Pratap Public School, Karnal

Mid-Term Examination (2023)

Class - IX

Subject - Science

Time : 3 Hours **M.M : 80**

Name ..... **Roll No.** ..... **Section** .....

General Instructions:-

1) *All questions are compulsory.*
2) *This question paper consists of three sections A, B and C.*
3) *Section A is Physics (25 marks), Section B is Chemistry (27 marks) and Section C is Biology (28 marks).*
4) *Each section consists of 1 mark, 2 marks,3 marks, 4 marks and 5 marks questions.*
5) *Marks are indicated against each question.*
6) *Internal choices have been given in each section. Section - A (Physics)*

1. The area under velocity – time graph is equal to
   (a) distance travelled (b) speed
   (c) magnitude of displacement (d) none of these
2. The direction of acceleration of a body moving in a uniform circular path would be
   (a) towards the centre of circle (b) away from the centre of circle
   (c) above the plane of circle (d) none of these
3. If a body does not change its velocity with time, its acceleration is
   (a) 0 (b) infinite
   (c) unity (d) none of these
4. A particle is moving in a circular path of radius r. The displacement after half a circle would be
   (a) 0 (b) πρ
   (c) 2r (d) 2πr
5. A force of magnitude 2F acts on the body and produces an acceleration a. The mass of the body is

   (a) $\frac{2F}{a}$ (b) $\frac{F}{2a}$ (b) $\frac{F}{a}$ (b) $2F \times a$

6. Rate of change of momentum is
   (a) impulse (b) acceleration
   (c) force (d) velocity
7. While flying, a bird pushes the air
   (a) downward (b) upward
   (c) side wise (d) backward

8. The value of acceleration due to gravity is

(a) same at equator and poles (b) least on poles

(c) least on equator (d) increases from pole to equator

9. State any four natural phenomena explained by universal law of gravitation. [2]

10. Why are road accidents at high speeds very much worse than accidents at low speeds?

OR

Calculate the force exerted by a nail on a hammer of mass *500 g* moving at *50 m/s* striking it. Consider that the nail stops the hammer in a short time of *0.01 s*. [2]

11. Raman while driving to market, computes the average speed for his trip to be 30 km/h. On his return trip to home along the same route, there is less traffic and the average speed is 50 km/h. What is the average speed for Raman's trip. [3]

OR

Write three differences between speed and velocity.

12. A train starting from rest attains a velocity of 90 km/h in 20 minutes. If it is assumed that acceleration is uniform, find: (a) its acceleration and (b) distance travelled by the train for attaining this velocity. [3]

13. Give reasons for the following: [3]

(a) It is dangerous to jump out of a moving bus.

(b) When a tree is shaken, leaves fall off.

(c) Athletes are advised to come to a stop slowly after the completion of a fast race.

(d) Recoiling of gun.

(e) A cricketer lowers his hand while catching a ball

CASE STUDY BASED QUESTION

14. In order to understand the motion of objects whether hollow or solid, big or small under the influence of gravitational force of the earth, an experiment was done to check if they will fall from a height at the same rate or not. It was found that all objects of different kind fall at the same rate According to story, Galileo also dropped different objects from the top of the Leaning Tower of Pisa in Italy to prove the same.

Now answer the following questions:

(a) Why does a sheet of paper fall slower than one that is crumpled into a ball? [1]

(b) What is the acceleration of the free fall? [1]

(c) A stone is released from the top of a tower of height 19.6 m. Calculate its final velocity just before touching the ground. [2]

OR

A stone is thrown vertically upwards with an initial velocity of *40 m/s*. Taking $g = 10\ m/s^2$, find the maximum height reached by the stone.

SECTION B (CHEMISTRY)

1. What happens when ice melts into water?
   (a) it absorbs heat (b) it releases heat
   (c) neither it releases nor absorbs heat (d) it absorbs heat first and later releases it
2. Evaporation occurs at
   (a) boiling point (b) all temperatures
   (c) melting point (d) freezing point
3. The evaporation of liquid in a china dish can be accelerated by
   (a) keeping the dish in open (b) blowing air into the liquid
   (c) keeping the dish under a moving fan (d) all of these
4. What happens when a beam of light is passed through a colloidal solution?
   (a) It is reflected (b) it is absorbed
   (c) it is scattered (d) it is refracted
5. The basic substance which cannot be broken down into simpler substances by chemical reaction is called
   (a) compound (b) mixture
   (c) element (d) solution
6. Which of the following represents a group of elements?
   (a) silver, gold, brass (b) copper, aluminium, solder
   (c) copper, tin, bronze (d) carbon, silicon, sulphur
7. For any substance why does the temperature remain constant during the change of state. [2]
8. A sugar syrup of mass 214.2 g contains 34.2 g of sugar. Calculate the mass-by-mass concentration of sugar in the syrup. [2].

OR

If 25 ml of acetone is present in 150 ml of its aqueous solution, calculate the concentration of solution.

9. You are provided with soda water, milk and muddy water. How can you differentiate between them in terms of (a) homogeneity, (b) filtration, (c) Tyndall effect. [3]
10. You want to wear your favourite shirt to a party but the problem is that it is still wet after a wash. Mention three steps with reasons that you would take to dry it faster. [3]
11. Distinguish between solid, liquid and gas in tabular form under the characteristics (a) interparticle force of attraction, (b) density, (c) kinetic energy of particles, (d) diffusion, (e) fluidity. [5]

OR

Give reasons for the following:

(a) Ice floats on water.

(b) Naphthene balls disappear without leaving any residue.

(c) Steam gives more severe burns than boiling water.

(d) Cotton clothes are worn in summers

(e) Smell of hot cooked food reaches us several metres away.

CASE STUDY BASED QUESTION

12. To understand the concept of mixture and compounds an activity was done in the class. For this the class was divided in two groups and they were given 50 g of iron fillings and 3 g of Sulphur powder.

Group I: Mix and crush iron fillings and Sulphur powder.

Group II: Mix and crush iron fillings and Sulphur powder. Heat this mixture strongly till red hot.

Remove from flame and let the mixture cool.

Based on the above paragraph answer the following questions

(a) What happens when magnet is brought near both the materials? [1]

(b) What happens when one part of each material is added to carbon disulphide? [1]

(c) Compare the gases evolved in both cases when dilute sulphuric acid is added to them. [2]

Write two differences between mixtures and compounds.

SECTION-C (BIOLOGY)

1. Which cell organelle plays a crucial role in detoxifying many poisons and drugs in a cell? [1]

(a) Golgi apparatus (b) Lysosomes

(c) Smooth endoplasmic reticulum (d) Vacuoles

2. Organelle other than nucleus, containing DNA is [1]

(a) endoplasmic reticulum (b) Golgi apparatus

(c) mitochondria (d) lysosome.

3. Select the odd one out. [1]

(a) The movement of water across a semi-permeable membrane is affected by the amount of substances dissolved in it.

(b) Membranes are made of organic molecules like proteins and lipids.

(c) Molecules soluble in organic solvents can easily pass through the membrane.

(d) Piasma membranes contain chitin sugar in plants.

4. Voluntary muscles are found in [1]

(a) alimentary canal (b) limbs

(c) iris of the eye (d) bronchi of lungs.

5. Which of the following cells is found in the cartilaginous tissue of the body? [1]

(a) Mast cells (b) Basophils

(c) Osteocytes (d) Chondrocytes

6. A nail is inserted in the trunk of a tree at a height of 1 metre from the ground level. After 3 years the nail will [1]

(a) move downwards (b) move upwards

(c) remain at the same position (d) move sideways.

7. Differentiate between a prokaryotic and eukaryotic cell. (Any four) [2]

OR

a) How are chromatin threads and chromosomes related to each other?

b) Define plasmolysis.

8. Do you agree that "a cell is a building unit of an organism". If yes, explain why? [2]

9. a) Write four points of differences between blood and lymph.

b) State two important functions of areolar tissue.

OR

a) List two characteristics of cork.

b) Name the tissue present in husk of coconut and in the lining of blood vessels. [3]

10. Describe the structure of the controlling centre of the cell. Q11. Draw a labelled diagram of the basic unit of nervous tissue. [3]

12. Read the case-based questions carefully and answer the question that follow:

Bone is a solid, hard porous tissue. It forms the natural skeleton and gives the body its basic structure and also supports the body. Its matrix is impregnated with phosphates and carbonates of calcium and magnesium which provides hardness to it. The matrix also contains ossein protein. The matrix is arranged in concentric rings which are called lamellae. Bone cells lie between the lamellae in fluid-filled spaces called lacunae.

a) What are bone cells called?

b) Name the main constituents of matrix of bone.

c) Write any two points of differences between bone and cartilage.

OR

Draw well labelled diagram of compact bone.

13. a) Differentiate between parenchyma, collenchyma and sclerenchyma on the basis of their cell wall and functions.

b) What are the functions of stomata? (5)

OR

Differentiate between striated, unstriated and cardiac muscles on the basis of their structure and location in the body. Also draw diagrams for all the three types of muscles.

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