



Time: 3 Hours

SCIENCE (IX)

MM: 80

General Instructions:

- (i) This question paper consists of 39 questions in 3 sections. Section A is Physics, Section B is Chemistry and Section C is Biology.
- (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) All Multiple choice questions will be of 1 Mark each.

SECTION A [PHYSICS]

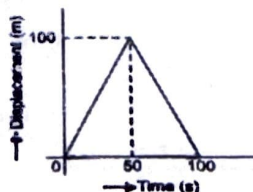
1. A car runs at a uniform rate on a circular track of radius 100m taking 62.8s on each lap. What is the average velocity and average speed of car for one complete lap? [Take $\pi = 3.14$]
(a) 10 m/s, 10m/s (b) 0, 10m/s (c) 0,0 (d) 10m/s, 0
 2. Velocity time graph for two particles A and B have been shown here. Which of the following statement about them is correct?
(a) Velocities of A and B are equal.
(b) Accelerations of A and B are equal.
(c) Acceleration of A is more than that of B
(d) Acceleration of B is more than that of A.
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3. A scooter of mass 120 kg is moving with an acceleration of 1.5m/s^2 . The force required to stop the scooter will be:
(a) 720 N (b) 180 N (c) 360 N (d) 648 N
 4. A body is projected vertically upward with an initial velocity u . If the acceleration due to gravity is g , the time for which it remains in air, is:
(a) u/g (b) ug (c) $2u/g$ (d) $u/2g$
 5. Observe the diagram carefully and choose the correct option.
(a) The downward force acting on the nail is greater than the upthrust of water on the nail
(b) The upward force acting on the nail is greater than the downward force acting on the nail.
(c) There is no net force acting on the nail and the cork.
(d) The net force on the iron nail and the cork is in the same direction.
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6. For negative work, force makes an angle of _____ with the displacement.
(a) 0° (b) 45° (c) 90° (d) 180°
 7. Identify the situation where the work is being done by the force.
(a) The weight of a book at rest on a table.
(b) The tension in an elastic band wrapped around a parcel.
(c) The pull of a moving railway engine on its coaches.
(d) The push of a person's feet when standing on a concrete floor.
 8. Assertion: Momentum is a vector quantity.
Reason: Momentum is the product of mass and velocity.
(a) Both A and R is true and R is the correct explanation of A.
(b) Both A and R is 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.
 9. Assertion: A copper sphere of mass 10 kg is placed on the surface of the earth. A gravitational force exists between the earth and the copper sphere.
Reason: Force on copper sphere due to earth is much greater than the gravitational force on earth due to copper sphere.
(a) Both A and R is true and R is the correct explanation of A.
(b) Both A and R is 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.
 10. State the conditions for work to be done. Also give the mathematical relation between Work and Force. 2

OR

Define 1J of work. A force of 15 N is acting on the object. The object is displaced through 2 m in the direction of the force. If the force acts on the object all through the displacement, then what is the work done?

$$W = \text{force} \times \text{displacement}$$
$$= 15 \text{ N} \times 2$$

11. A girl walks along a straight path to drop a letter in the letterbox and comes back to her initial position. Her displacement-time graph is shown in figure. Plot a velocity-time graph for the same. Also define acceleration. 2



12. Define Pascal's Law of fluids. 2
13. It is a common experience that when a man jumps out of a boat to the bank of a river, the boat moves backwards, away from him. Give reason for this and also state the law of motion responsible for this observation. 3

OR

- A 2000 kg car is traveling at 30 m/s. The driver applies the brakes, and the car decelerates at a rate of 5 m/s^2 . Calculate the braking distance and time taken for application of brakes. Also calculate the Force exerted. 3
14. Define Pressure. Calculate the average density of the earth in terms of g , G and R . 3
15. While playing carom, the coins on a carrom board are arranged vertically. Aditya observed that a fast moving striker strikes a pile of carrom coins and only the bottom coin gets removed and the vertical arrangements of the coins remain intact. 4
(a) Which law of motion best describes the given situation? State the law.
(b) What's the reason that only the bottom coin is removed and the rest of the coins do not fall?
(c) What is the momentum of a body of mass $2m$ and velocity $v/2$? 5

16. Attempt either A or B:

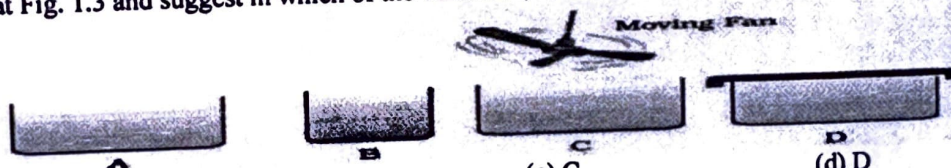
- A. (i) Differentiate between G and g . (any two points)
(ii) Why the Depression is much more when a man stands on the cushion than when he lies down on it?
(iii) A stone is allowed to fall from the top of a tower 300 m height and at the same time another stone is projected vertically up from the ground with a velocity of 100 m/s. Find when and where the two stones meet? (Take $g=10 \text{ m/s}^2$). 5

OR

- B. (i) Derive mathematical relation between universal gravitational constant and acceleration due to gravity.
(ii) State Archimedes Principle.
(iii) A ball thrown up vertically returns to the thrower after 6s. Find
a) The velocity with which it was thrown up
b) The maximum height it reaches.
c) Its position after 4 sec.

SECTION-B [CHEMISTRY]

17. Look at Fig. 1.3 and suggest in which of the vessels A, B, C or D the rate of evaporation will be the highest?



- a) A (b) B (c) C (d) D
18. On Converting 25°C , 37°C , 69°C to kelvin scale, the correct sequence of temperature will be:
(a) 298 K, 311 K and 339 K
(b) 298 K, 300 K and 338 K
(c) 298 K, 278 K and 542 K
(d) 298 K, 310 K and 342 K
19. Ordinary starch stirred with cold water will result in a
(a) colloid (b) true solution (c) Suspension (d) None of these
20. Which fabric is comfortable for summers?
(a) Nylon (b) Acrylic (c) Polyester (d) Cotton
21. Chemically dry ice is
(a) solid CO_2 (b) solid NO_2 (c) solid SO_2 (d) solid H_2
22. Which of the following is not a metalloid?
(a) silicon (b) germanium (c) antimony (d) vanadium
23. Which of the following statements are true for pure substances?
(i) Pure substances contain only one kind of particles
(ii) Pure substances may be compounds or mixtures
(iii) Pure substances have the same composition throughout
(iv) Pure substances can be exemplified by all elements other than nickel
(a) (i) and (ii) (b) (i) and (iii) (c) (iii) and (iv) (d) (ii) and (iii)

24. Assertion (A): A mixture is made up of two or more elements or two or more compounds.
Reason (R): Ammonium chloride on heating changes directly to vapours.
(a) Both A and R is true and R is the correct explanation of A.
(b) Both A and R is 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.
25. Determine the mass concentration of a salt solution in which 13 g of salt is added to 52 mL of water. 2

OR

26. Define Solubility. How can we increase the solubility of a solution? 3
(a) What do you understand by the term 'diffusion'?
(b) Define Latent heat of vaporization.
(c) Name the process of conversion of solid state into gaseous state without coming to liquid state.
27. (a) Under which category of mixtures will you classify alloys and why? 3
(b) Name a non-metal necessary for combustion.
28. In an experimental activity, crushed ice was taken in a beaker. A thermometer is fitted in such a way that its bulb was thoroughly surrounded by ice. The beaker is now slowly heated and temperature was regularly noted. Temperature rises gradually as the heating is continued and becomes constant when ice starts changing into liquid. Select the correct answers for the following questions: 4

i) What name is associated with conversion of ice into water?

- a) Evaporation b) Sublimation c) Freezing d) Fusion of Solid

ii) What specific name is given to the constant temperature?

- a) latent heat of fusion b) Boiling Point c) Melting Point d) Condensation point

iii) The heat added to the system at constant temperature is called:

- a) specific heat b) latent heat c) residual heat d) none of the above

iv) Where does the heat energy go when the temperature does not rise?

29. Attempt either A or B 5

A. Give any three points of differences between Solution, Suspension or Colloids.

OR

- B. (i) Give an example of an emulsion and any one factor affecting rate of evaporation positively.
(ii) State any two physical properties of metals.
(iii) Give an example of an alloy along with its constituents.
(iv) What is Tyndall Effect?
(v) Define homogeneous mixtures.

SECTION-C

30. In a plant cell, plastids are of various types. The colorless plastids present in a plant cell are associated with:

- (a) food manufacturing and processing
(b) generation of energy.
(c) storage of protein and starch.
(d) transport of materials across the cell.

31. All the listed nutrients are present in fertilizer, except:

- a) K b) N c) P d) Fe

32. Assertion (A): The central vacuole of some plant cells may occupy 50-90% of the cell volume.
Reason (R): Many substances of importance in life of the plant cell are stored in vacuoles.

- (a) Both A and R is true and R is the correct explanation of A.
(b) Both A and R is 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. 2

33. State the function of:

- (a) Chromosomes present in the nucleus of the cell.
(b) Cell membrane present in cell. 2

34. What are macronutrients and micronutrients? Explain with suitable example of each. 2

35. What is osmosis? Describe an activity using dry raisins, plain water and concentrated solution of sugar to explain that how osmosis takes place in hypertonic, hypotonic and isotonic solutions. 3

36. What are the advantages of composite fish culture? (Any three points). 3

OR

What would happen to the cell if there would be no Golgi apparatus in the cell? (Any three points). 3

37. (a) Give any one advantage of Intercropping.

- (b) Give any two points of differences between manures and fertilisers.

38. Cattle husbandry is done for two purposes— milk and draught labour for agricultural work such as tilling, irrigation and carting. Indian cattle belong to two different species, *Bos indicus* (cows), and *Bos bubalis* (buffaloes). Milk-producing females are called milch animals (dairy animals), while the ones used for farm labour are called draught animals. Milk production depends on the duration of the lactation period, meaning

the period of milk production after the birth of a calf. So, milk production can be increased by increasing the lactation period. Exotic or foreign breeds are selected for long lactation periods, while local breeds show excellent resistance to diseases. The two can be cross-bred to get animals with both the desired qualities. The food requirements of dairy animals are of two types: (a) maintenance requirement, which is the food required to support the animal to live a healthy life, and (b) milk producing requirement, which is the type of food required during the lactation period.

- a) What are draught animals?
- b) Give examples of Exotic breeds and local breeds of cows.
- c) What are the food requirements of dairy animals?

OR

- c) State one advantage both of Exotic breeds and of Local breeds?

5

39.

A.

Attempt either A or B

I. Name the following:

- (i) Types of cell division responsible for growth and repair of cells.
- (ii) Process by which Amoeba engulfs its food
- (iii) Cell organelle found only in animal cell.
- (iv) Power house of the cell.

II. Differentiate between Animal Cell and Plant Cell. (any three points)

OR

B.

Draw a well-labeled and neat diagram of Plant cell. Also name any two organelles found only in Plant Cell.

- (i) Ribosomes
- (ii) Vacuoles