

Time: 1 Hour 30 Minutes

Max. Marks: 40

Instructions:

1. The question paper has 4 sections and 17 questions. Answer all the questions.
2. Section A: 10 multiple choice questions of 1 mark each.
3. Section B: 3 questions of 2 marks each. Section C: 2 questions of 4 marks each.
4. Section D: 2 questions of 8 marks each, with internal choice.
5. Draw diagrams wherever necessary and show all steps in numerical problems.

SECTION – A

10 × 1 = 10

Choose the correct answer and write its letter.

1. The boiling point of water on the Kelvin scale is
A) 100 K B) 273 K C) 373 K D) 0 K
2. Evaporation is a
A) bulk phenomenon
B) surface phenomenon
C) chemical change
D) process that needs boiling
3. Which of the following is a compound?
A) brass B) air C) water D) sea water
4. Cream is separated from milk by
A) filtration B) centrifugation C) sublimation D) distillation
5. An athlete runs one full round of a circular track and comes back to the starting point. His displacement is
A) equal to the circumference
B) equal to the diameter
C) zero
D) double the circumference
6. The area under a velocity–time graph gives
A) acceleration B) distance travelled C) force D) speed
7. Momentum of an object is equal to
A) mass × acceleration
B) mass × velocity
C) force × time ÷ mass
D) mass ÷ velocity
8. Action and reaction forces always act on
A) the same body
B) two different bodies
C) the Earth only
D) bodies at rest only

9. The value of the universal gravitational constant G is

- A) $9.8 \text{ N m}^2/\text{kg}^2$
- B) $6.67 \times 10^{-11} \text{ N m}^2/\text{kg}^2$
- C) $6.67 \times 10^{11} \text{ N m}^2/\text{kg}^2$
- D) $1.6 \text{ N m}^2/\text{kg}^2$

10. The weight of a 10 kg object on the Earth ($g = 9.8 \text{ m/s}^2$) is

- A) 10 N B) 9.8 N C) 98 N D) 0.98 N

SECTION – B

3 × 2 = 6

11. Why does a desert cooler cool better on a hot, dry day?

12. What is a saturated solution? How can you make a saturated solution dissolve more solute?

13. Find the momentum of a 2 kg ball moving with a velocity of 3 m/s. What will its momentum be if the velocity is doubled?

SECTION – C

2 × 4 = 8

14. Write any four differences between a true solution, a colloid and a suspension.

15. A stone is thrown vertically upward with an initial velocity of 19.6 m/s. Taking $g = 9.8 \text{ m/s}^2$, find (i) the maximum height reached by the stone and (ii) the time taken to reach the maximum height.

SECTION – D

2 × 8 = 16

Each question has an internal choice. Answer either (A) or (B).

16. A) State the universal law of gravitation and write its mathematical form. Explain the terms in it. Write any four phenomena explained by this law.

(OR)

B) State the law of conservation of momentum. Prove it using Newton's third law of motion. Explain the recoil of a gun with this law.

17. A) Write any four characteristics of particles of matter. Describe one activity to show each of them.

(OR)

B) Describe, with a neat labelled diagram, how you will separate a mixture of acetone and water by distillation. Also write two examples each of physical changes and chemical changes.

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