

SECOND TERM EVALUATION 2024-25

PHYSICS

Standard: IX

Time: 1 ½ Hour

Total Score: 40

Instructions:

- First 15 minutes is given as cool-off time. Use this time for reading and understanding the questions.
- Answer the questions based on instructions.
- Allocate time according to marks.

Answer any three questions from 1 to 4. (1 mark each)

1. Write the SI unit of power.
2. Define kinetic energy.
3. Identify the relation in the first pair and complete the second:
Force: Newton :: Work: ?
4. An object is dropped from a height. What type of motion does it exhibit?

Answer any seven questions from 5 to 13. (2 marks each)

5. An object of mass 2 kg is acted upon by a net force of 10 N. Find its acceleration.
6. A vehicle accelerates uniformly from rest to a velocity of 20 m/s in 10 seconds.
 - a) What is its acceleration?
 - b) What is the distance covered in this time?
7. Write two differences between potential energy and kinetic energy.
8. A block of mass 5 kg is lying on a rough surface. Explain how frictional force acts in this case.

9. Rewrite the following statements by changing the underlined words if incorrect:
- The acceleration due to gravity is the same on Earth and the Moon.
 - Weight is measured in kilograms.
10. A stone is tied to a string and rotated in a horizontal circle. What type of force acts on the stone? Explain.
11. Classify the following into contact forces and non-contact forces:
- Magnetic force
 - Tension in a string
 - Gravitational force
 - Friction
12. The relative density of mercury is 13.6. What does this mean? Will a solid cube of density 10 g/cm³ float on mercury? Justify.
13. Explain the energy transformation that occurs when a stretched rubber band is released.

Answer any five questions from 14 to 19. (3 marks each)

14. A truck of mass 5000 kg moves with a velocity of 20 m/s.
- Find its momentum.
 - If it comes to rest in 10 seconds, calculate the retarding force.
 - State the law used in your calculations.
15. A ball is thrown vertically upward with an initial velocity of 20 m/s.
- What is its velocity at the highest point?
 - What is the acceleration acting on the ball throughout its motion?
 - Calculate the maximum height reached (Take $g = 10 \text{ m/s}^2$).
16. Explain the concept of balanced and unbalanced forces with one example each.
17. A cyclist riding in a circular track experiences centripetal force.
- What provides the centripetal force?
 - Write any two methods to reduce this force.
 - What happens if the force is insufficient?

18. An object is placed on an inclined plane and begins to slide. Explain the role of friction and gravitational force in its motion.
19. Three liquids (water, oil, and glycerin) flow down an inclined plane.
- Which liquid flows the slowest?
 - Name the property responsible for this.
 - Define this property.
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Answer any two questions from 20 to 22. (4 marks each)

20. A car of mass 1000 kg accelerates uniformly from rest to a velocity of 30 m/s in 6 seconds.
- Find the acceleration.
 - Calculate the force acting on the car.
 - Determine the distance covered in this time.
 - What is the work done on the car?
21. A planet has twice the mass of Earth and the same radius.
- How will the acceleration due to gravity on this planet compare to that on Earth?
 - Derive the formula used to calculate the acceleration due to gravity on the surface of a planet.
22. Analyse the motion of an object shown in the velocity-time graph below:
- Describe the type of motion in each phase.
 - Calculate the total distance travelled during the motion.
 - Determine the acceleration in the first 5 seconds.