

MRD-9th (2025)**Time: 3 Hours****PHYSICS-9th****Marks: 65****Note:** There are three sections in this paper i.e. A, B & C?**Version: A****INSTRUCTION:**

- Please attempt Section-A on the MCQs Answer Sheet only.
- Only black ball point or marker may be used for shading the relevant circle.
- Please make sure that there is no cutting, over writing, erasing, or multiple circles shading.

Time: 20 Minutes**SECTION-A****Marks: 12****Q1:** Choose the correct option i.e. A, B, C or D?

- The mass of a typical bacterium is $0.35\mu\text{g}$, which is equivalent to.
☐ $3.5 \times 10^{-4}\text{g}$ ☐ $3.5 \times 10^{-5}\text{g}$ ☐ $3.5 \times 10^{-6}\text{g}$ ☐ $3.5 \times 10^{-7}\text{g}$
- The scalar quantity among the following is.
☐ Speed ☐ Torque ☐ Momentum ☐ Acceleration
- The slope of a speed-time graph gives the magnitude of.
☐ Distance ☐ Speed ☐ Velocity ☐ Acceleration
- The force required to produce a change in momentum of 500Ns in a body in 5 seconds is.
☐ 5N ☐ 50N ☐ 100N ☐ 2500N
- The force of friction between road and tyre of moving car is.
☐ Sliding ☐ Rolling ☐ Limiting ☐ Static
- The cause of change in rotational motion is.
☐ Force ☐ Inertia ☐ Torque ☐ Power
- An object is in rotational equilibrium when.
☐ Torques are balanced ☐ Force are balanced
☐ It is in linear motion ☐ It is at rest
- If an object is taken to the top of a mountain, its weight;
☐ Decreases ☐ Increases
☐ Remain same ☐ Becomes zero
- If the mass of an object is halved, its gravitational potential energy changes by factor.
☐ 2 ☐ $\frac{1}{2}$ ☐ 4 ☐ $\frac{1}{4}$
- Amount of energy released when 3kg of mass is completely converted into energy is.
☐ $27000 \times 10^{17}\text{J}$ ☐ $270 \times 10^{17}\text{J}$ ☐ $27 \times 10^{17}\text{J}$ ☐ $2.7 \times 10^{17}\text{J}$
- Block A weighing 10N and Block B 15N are lying on the same surface area, the pressure exerted by Block A is.
☐ Greater than B ☐ Less than B
☐ Same as B ☐ Independent of area

12. The freezing point of water in Kelvin scale is.

☐ 0k

☐ 100k

☐ 273k

☐ 373k

MRD-9th (2025)

Time: 3 Hours

PHYSICS-9th

Marks: 53

SECTION-B

Marks: 32

Q2: Write short note to any EIGHT of the following parts. All parts carry equal marks?

1. Enlist the base and derived physical quantities among the following. Density, Weight, Pressure, Luminous intensity, Torque, Electric current, Velocity, Temperature?
2. A bullet accelerates the length of the barrel of a gun 0.85m long with magnitude of $6.5 \times 10^5 \text{ m/s}^2$. With what speed does the bullet exit the barrel?
3. State law of inertia and explain it when a body is: At rest in Motion.
4. What is the magnitude of centripetal force on a body of mass 5kg moving with velocity 6m/s in a circle of radius 4m?
5. State how head-to-tail rule is used for addition of force vectors?
6. Find the magnitude and direction of force when $F_x = 4\text{N}$, $F_y = 3\text{N}$?
7. What is gravitational force? Does sun exert a stronger force on the mercury than the mercury exerts on the sun? Justify your answer?
8. A person pushes a box with a force of 150N at an angle of 60° to the horizontal for a distance of 3 meters. What is the work done on the box?
9. State the law of conservation of energy and describe the energy conversions in hydroelectric power plants?
10. Define young's modulus and derive its mathematical form?
11. Define radiation and explain why a black car standing in the sun warms up more quickly than any other?

SECTION-C

Marks: 21

Q3: Answer any THREE questions. All question carry equal marks?

1. Describe motion and compare rotator motion and vibratory motion with respect to: Movement of particles of an object, Path of motion. Example from real life?
2. (a) Formulate the equation for determining the mass of earth using law of universal gravitation
(b) Calculate the gravitational force of attraction between two bodies, one of mass $4 \times 10^3 \text{ kg}$ and the other mass $5 \times 10^2 \text{ kg}$, when they are separated by 0.8m. ($G = 6.670^{-11} \text{ Nm}^2 \text{ kg}^{-2}$)
3. (a) Prove an example to explain how Pascal's law governs the transmission of pressure in a confined fluid?
(b) The small piston of a hydraulic lift has an area of 0.20 m^2 where the large piston has an area of 0.90 m^2 . A car weighing $1.2 \times 10^4 \text{ N}$ sits

on rack mounted on the large piston. How large a force must be applied to the small piston to support the car?

4. (a) Explain volume thermal expansion of solids and the factors on which it depends?
(b) The volume of a steel ball is 800cm^3 at 18°C . Find out the new volume of the ball if the temperature is raised to 50°C . The coefficient of volumetric expansion of steel is $35 \times 10^{-6} \text{K}^{-1}$?

