

Time Allowed: 3 Hrs

Marks: 85

Note: There are **Three Sections** in this paper i.e. A, B and C. Attempt Section-A and return it to the Superintendent within the given time.

No marks will be awarded for **Cutting, Erasing and Overwriting**.

Mobile Phone is strictly prohibited in Examination Hall.

Time: 20 Minutes

SECTION "A"

Marks: 18

Q.1. Choose the correct option and shade one of (A, B, C, D) in the given **Bubble Answer Sheet**.

- i. The result of $8m \times 7m$ to the correct number of significant figures is:
 (A) 56 m^2 (B) 50 m^2 (C) 60 m^2 (D) 55 m^2
- ii. Two forces of magnitude 40N and 30N act at a point. The magnitude of their maximum resultant force is:
 (A) 10N (B) 40N (C) 50N (D) 70N
- iii. If a vector A is inclined at an angle of 30° to another vector B, the magnitude of their vector product is:
 (A) AB (B) -AB (C) $AB/2$ (D) Zero
- iv. The example of scalar product among the following is:
 (A) torque (B) work (C) angular momentum (D) Magnetic force on moving charge
- v. The slope of displacement-time graph for a body is a straight line parallel to time axis. This shows that the body is:
 (A) moving with uniform velocity (B) moving with uniform acceleration (C) moving with variable velocity (D) stationary
- vi. The launch angle at which the range of a projectile is maximum is:
 (A) 30° (B) 45° (C) 60° (D) 90°
- vii. In one-dimensional elastic collision, if a body of mass m_1 moving with velocity V collides with identical body at rest, the velocity of m_1 after collision is approximately:
 (A) V (B) 2V (C) -V (D) 0
- viii. A body moving towards east is facing air resistance towards west. The work done by the air resistive force is:
 (A) positive (B) negative (C) zero (D) infinite
- ix. Two bodies A and B do the same amount of work in times 10s and 40s respectively. The power of B is:
 (A) one fourth that of A (B) half that of A (C) same as that of A (D) four times that of A
- x. If both the mass and radius of a planet is doubled then the magnitude of escape velocity on this planet will be:
 (A) doubled (B) halved (C) quadrupled (D) constant
- xi. A ball attached to a string is whirled in horizontal circle with constant speed. The centripetal acceleration in the ball is caused by:
 (A) gravitational force (B) normal force (C) frictional force (D) tension force
- xii. A net torque of 500Nm acts on a rotating body of moment of inertia 100 kgm^2 . The angular acceleration produced in the body is:
 (A) 5 rads^{-2} (B) 10 rads^{-2} (C) 20 rads^{-2} (D) 50 rads^{-2}
- xiii. If the linear speed of a body in uniform circular motion is doubled and radius of circle is halved, the centripetal force F acting on the body becomes:
 (A) 2F (B) 4F (C) 8F (D) 16F
- xiv. The ratio of the cross sectional of two pipes A and B is 4 : 5. For steady incompressible flow, the ratio of fluid velocities ($V_A : V_B$) in the pipes will be:
 (A) 4 : 5 (B) 5 : 4 (C) 16 : 25 (D) 25 : 16
- xv. The potential energy of a body in simple harmonic motion is zero when its:
 (A) kinetic energy is maximum (B) kinetic energy is zero (C) total energy is zero (D) displacement is maximum
- xvi. Two consecutive crests in a series of transverse waves are 20cm apart. If the wave speed is 5ms^{-1} , the frequency of waves is:
 (A) 20Hz (B) 25Hz (C) 30Hz (D) 45Hz
- xvii. In Young double slit experiment, if the separation between the screen and slits is doubled, the fringe spacing:
 (A) is doubled (B) is halved (C) remains constant (D) reduces to half
- xviii. When some heat is removed from a system, the change in its entropy is:
 (A) positive (B) negative (C) zero (D) infinite