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2. (a) What is "Trajectory" of a projectile? 2
- (b) Calculate the Horizontal Force required to move a body weighing 200 kg on a rough horizontal surface having coefficient of friction 0.35. 5
- (c) A projectile is fired at an angle  $\theta$  with the horizontal. Derive formulae for :  $3\frac{1}{2} + 3\frac{1}{2}$
- (i) Maximum Height
- (ii) Time of Ascent.
3. (a) Define "Angular Velocity". 2
- (b) Explain variation of 'g' (acceleration due to gravity) with Latitude. 5
- (c) State and explain Kepler's laws of planetary motion. 7
4. (a) What are Ultrasonic Waves? 2
- (b) Distinguish between "Longitudinal Waves" and "Transverse Waves". 5

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- (c) Define "Amplitude" of a wave. Prove that  $v = n\lambda$ , where symbols used carry their usual meanings. 2 + 5
5. (a) Define Mechanical Equivalent of Heat. 2
- (b) State and explain 1st law of thermodynamics. 5
- (c) Show that  $\alpha = \beta/2 = r/3$  where symbols used have their usual meanings. 7
6. (a) Define Electric Field Intensity. 2
- (b) 'n' number of capacitors each of capacitance 1 farad are first joined in "Parallel" and then in "Series". Find the ratio of their Equivalent capacitances. 5
- (c) State and explain Coulomb's law in Magnetism. Define UNIT POLE. 2 + 5
7. (a) State Kirchoff's voltage law. 2
- (b) A flat circular coil of 25 turns has diameter 0.10 metre and carries a current of 4 ampere. Find out the Magnetic Flux Density (B) at the centre of coil. 5