

*Answer Any One Question from the Following*

**1.Determination of Moment of inertia of cylinder/bar about axis by measuring the time period, of the cradle and with body of known moment of Inertia.**

- i). Write down the expression o the moment of inertia of known body ( cylinder ) of length l and radius r and mass M. [2+1]
- ii). Write a expression for the moment of unknown body ( working formula) and explain the constants. [5]
- iii) On what factor does the moment of inertia depend ? [2]
- iv). Define moment of inertia of a rigid body . [3]
- v). Can you find the moment of inertia of an irregular body by this method ? [2]

**2.Determination of Young's modulus of a metal bar of rectangular cross section by the method of flexure.**

- i) Write down the expression of Young's modulus ( working formula) and explain its constant. [ 6]
- ii) What is the elastic limit of rigid body? [3]
- iii) What will happen if the weight is not at half distance between the knife edges ? [ 1]
- iv) What is Hooke's law and breaking stress ? [2+2]
- v) What do you mean by ' center of suspension' and 'center of oscillation'? [ 1]

**3.Determination of rigidity modulus of wire by measuring the time period of torsional oscillation of a metal cylinder attached to it.**

- i) Write an expression for rigidity modulus ( working formula) explain the constants involved? [6]
- ii) What is torsional oscillation? [2]
- iii) On what factors does the modulus of rigidity depend ? [2]
- iv) What is the moment of inertia of the cylinder in this case? [2]
- v) What is a torsional couple? [3]