

# ASSIGNMENT

B.Sc. 4<sup>th</sup> semester

Mathematics(major)

Paper-4.2 (Mechanics)

Marks-20

1. Define limiting friction ? 1
2. What is co – efficient of friction and angle of friction? 2
3. State laws of friction? 3
4. Prove that if three forces acting upon a rigid body be represented in magnitude , direction, sense and the line of action by the sides of a triangle taken in order then they are equivalent to a couple whose moment is equal to twice the area of the triangle. 4
5. A heavy uniform rod of length ' 2a' rest in equilibrium having one end against a smooth vertical wall and being placed upon a peg at a distance " b" from the wall .Show that the inclination of the rod to the vertical is  $\sin^{-1}(b/a)^{1/3}$ . 5
6. If a system of forces in one plane reduces to a couple whose moment is G and when each force is turned round its point of application through a right angle it reduces to a couple of moment H, prove that when each force is turned through an angle  $\alpha$  the system is equivalent to a couple whose moment is  $G \cos \alpha + H \sin \alpha$ .For what

value of  $\alpha$  write the moment of the new couple be equal to the moment of the old couple?