

# ANURAG GROUP OF INSTITUTIONS

(AUTONOMOUS)

I B. Tech II Semester 2019 – 20

Assignment Paper – I

DEPARTMENT OF MECHANICAL ENGINEERING

SUBJECT: EM

BRANCHES: MECHANICAL & CIVIL

1. Determine the resultant magnitude and direction of concurrent forces system shown in **Fig. 1**. (CO-1)(L3)
2. The forces on the gusset plate of a joint in a bridge truss act as shown in the **Fig 2**. Determine the values of  $P$  and  $F$  to maintain equilibrium of the joint. (CO-1)(L3)
3. The cantilever shown is fixed at  $A$  and is free at  $B$ . Determine the reactions when it is loaded as shown in **Fig. 3**. (CO-1)(L3)
4. Two spheres each of diameter 20 cm and weight 50N rest in a horizontal channel of width 36 cm as shown in **Fig. 4**. Find the reactions on points of contact  $A$ ,  $B$  and  $C$ . (CO-1)(L3)
5. a) Define friction and write laws of friction. (CO-2)(L1)  
b) Define angle of friction and angle of repose.
6. The 500N block shown in **Fig. 5** is in contact with the incline. The coefficient of static friction is 0.25. Compute the horizontal force  $P$  necessary to (a) just start the block up the incline or (b) just prevent motion down the incline. (CO-2)(L3)

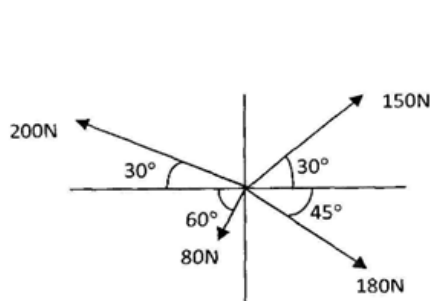


Fig. 1

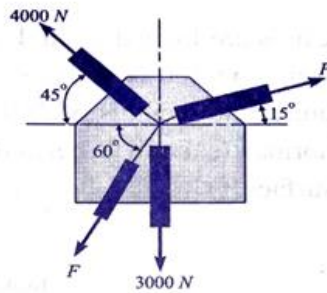


Fig. 2

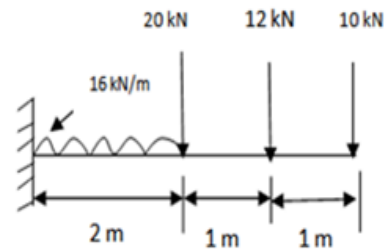


Fig. 3

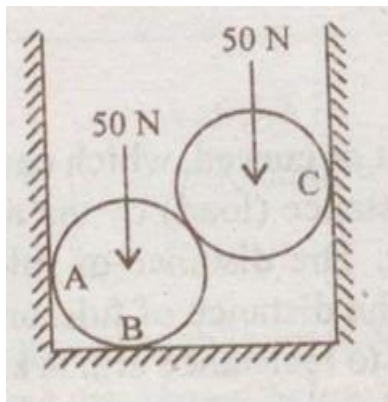


Fig. 4

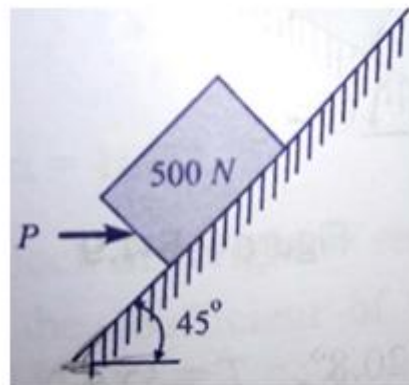


Fig. 5