

BHARATI VIDYAPEETH COLLEGE OF ENGINEERING
DEPARTMENT OF MECHANICAL ENGINEERING

TEST- II

CLASS: F.E.

SEM: I

SUBJECT: - ENGINEERING MECHANICS

DURATION: 01 HRS.

MAX. MARKS: - 20

DATE: - 26/10/2015

Instructions:

1. Illustrate your answers with neat sketches wherever necessary
2. Figures to the right indicate full marks
3. Assume suitable data if necessary
4. Preferably, write the answers in sequential order

Marks

Q.1 Attempt any five.

10

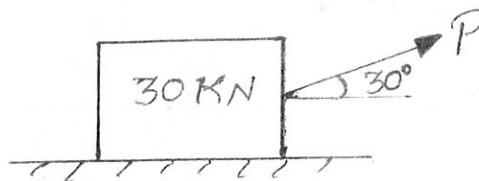
- a) (1) Define Limiting friction
 (2) State laws of friction

b) A force of magnitude 1500 N passes from B (6,6,8) to C(-6,2,2). Calculate the moment of this force about origin O.

c) A car covers a distance of 75 m in 5 sec and takes 4 sec to cover next 75 m. find the initial velocity and constant acceleration of the car.

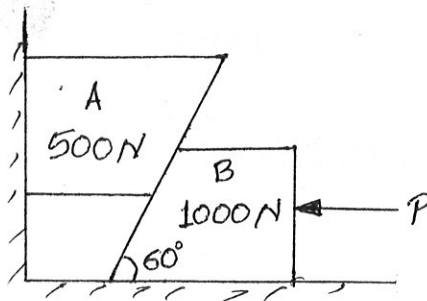
d) Draw a-t, v-t and x-t curve for uniform acceleration of the particle.

e) A block of weight 30 KN is pulled by a force P as shown in the fig. The coefficient of friction between the two surfaces of contact is 0.577. Find the minimum value of P required.



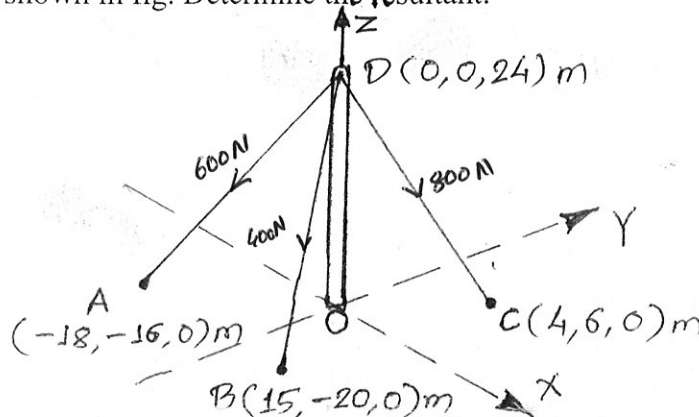
f) A body is allowed to fall under the action of gravity. It travels two points placed 45 m apart in one second. Find from what height above the higher point was the body allowed to fall.

Q.2 Assuming the values for $\mu = 0.25$ at the floor and $\mu = 0.3$ at the wall and $\mu = 0.2$ between the blocks. Find the minimum value of horizontal force P applied to the lower block that will hold the system in equilibrium. 05

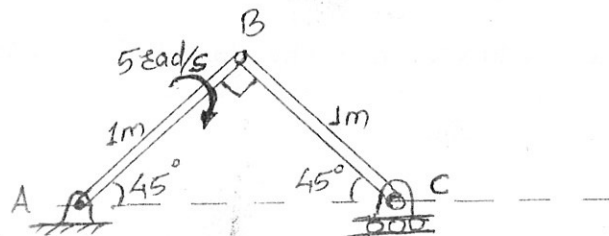


OR

A pole is held in place by three cables. If the force of each cable acting on the pole is as shown in fig. Determine the resultant. 05



Q.3 In the mechanism shown in fig. find velocity of point C and angular velocity of link BC if angular velocity of link AB is 5 rad/sec. Solve the problem when link AB and link BC make angle of 45° with horizontal as shown in the fig. 05



OR

In Asian games for 100 m event an athlete accelerates uniformly from the start to his maximum velocity in a distance of 4 m and runs the remaining distance with that velocity. If the athlete finishes the race in 10.4 sec,

- Determine
- (1) Initial acceleration
 - (2) Maximum velocity.

05