

**B.Tech. SEM -II (Chemical/ Civil/ Electrical/ Mechanical/ Production/
Computer/ Info. Tech./ Electronics / Bio Medical / E & TC) 2014**

Course (CBCS) : WINTER - 2018

SUBJECT: ENGINEERING MECHANICS

Day: Wednesday
Date: 14/11/2018

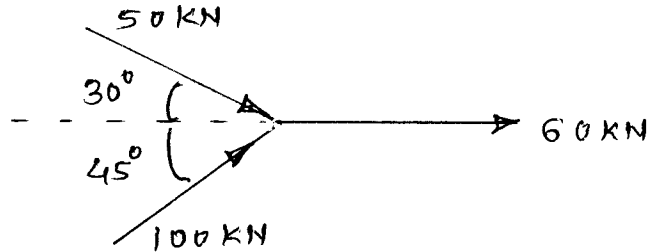
W-2018-2270

Time: 10.00 AM TO 01.00 PM
Max Marks: 60

N.B:

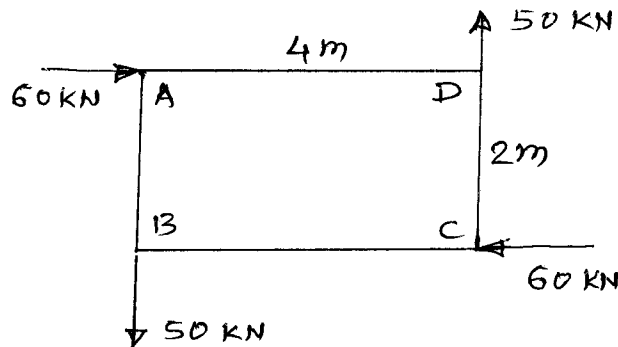
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.

- Q.1 a) What are different types of forces? (03)
 b) Calculate resultant of forces shown in figure. (07)

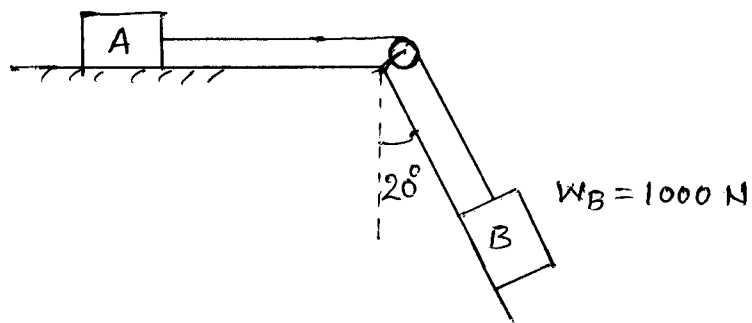


OR

- Q.1 Find out equilibrant of a force system shown in figure. (10)

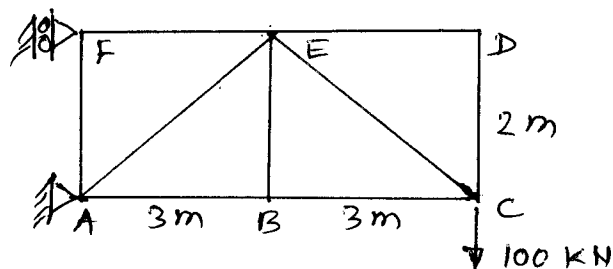


- Q.2 a) What is impending motion? (03)
 b) Calculate minimum weight of block 'A' for equilibrium. Take $\mu = 0.26$ Neglect friction at pulley. (07)



OR

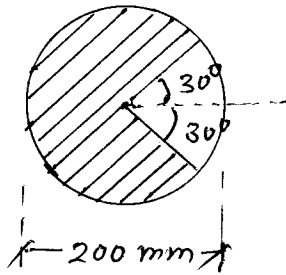
- Q.2 a) What is truss? (03)
 b) Calculate forces in all the members of truss shown in figure. (07)



P.T.O.

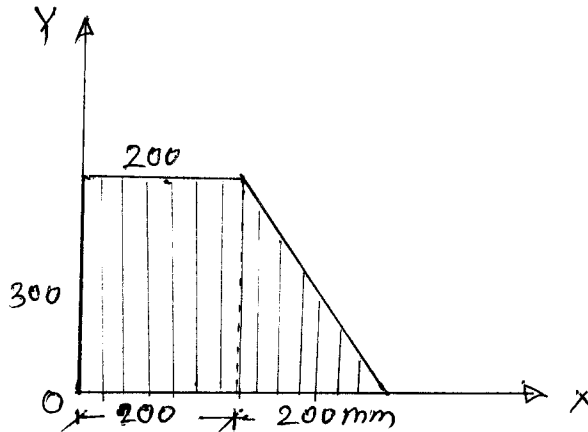
Q.3 a) What is radius of gyration? (03)

b) Calculate centroid of ^{shaded} area shown in figure. (07)



OR

Q.3 Calculate polar M.I. of area shown in figure about Z axis passing through origin. (10)



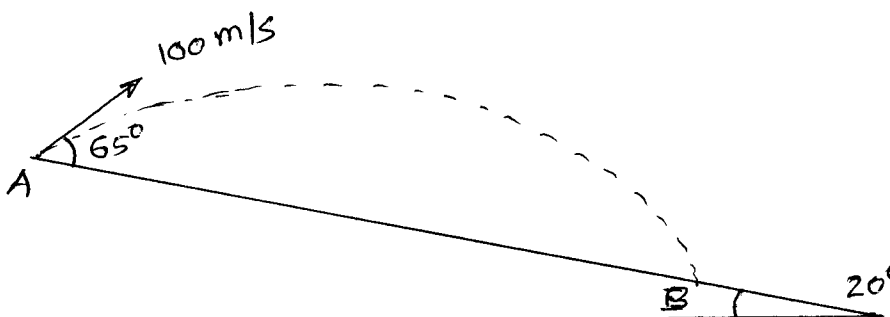
Q.4 a) What is relation between motion curves for displacement, velocity and acceleration? (03)

b) A body starts from rest with constant acceleration 3 m/s^2 , draw motion curve up to $t = 10 \text{ sec}$. (07)

OR

Q.4 When a cyclist is riding west at 20 kmph, he finds the rain meeting him at an angle 45° with vertical. When rides at 12 kmph he meets rain at an angle 30° with vertical. Find absolute velocity of the rain. (10)

Q.5 A projectile is fired on sloping ground as shown in figure. Calculate distance AB. (10)



OR

Q.5 Derive an expression for normal and tangential components of velocity and acceleration. (10)

P. T. O.

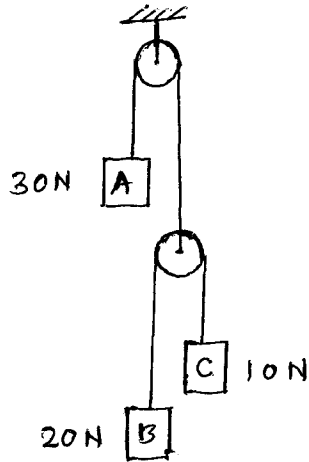
P. T. O.

Q.6 a) What is D'Alemberts principle?

(03)

b) A system of weights is released from rest. Find the acceleration of each weight.

(07)



OR

Q.6 Two spheres A & B of weight 300 N and 150 N are moving towards each other as shown in figure. Calculate their velocities after Impact. Take $e = 0.8$

(10)

