

**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

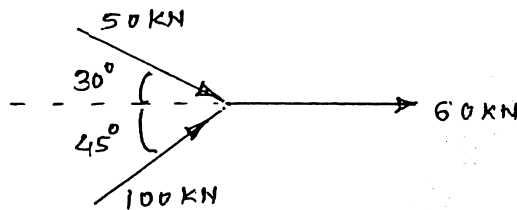
W-2018-2270

Time: 10.00 AM TO 01.00 PM
Max Marks: 60

N.B:

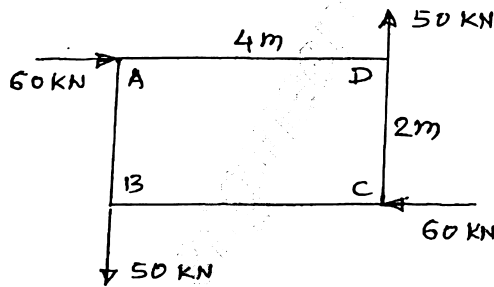
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data if necessary.

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

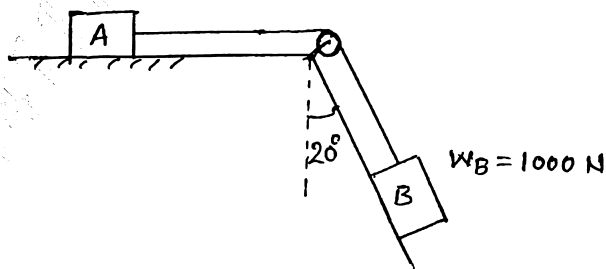


OR

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

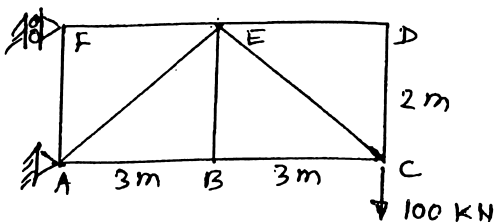


- Q.2 a)** What is impending motion? (03)
- b)** Calculate minimum weight of block 'A' for equilibrium. Take $\mu = 0.26$. Neglect friction at pulley. (07)



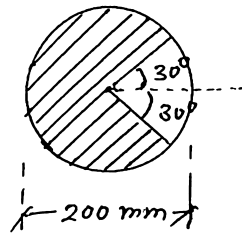
OR

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



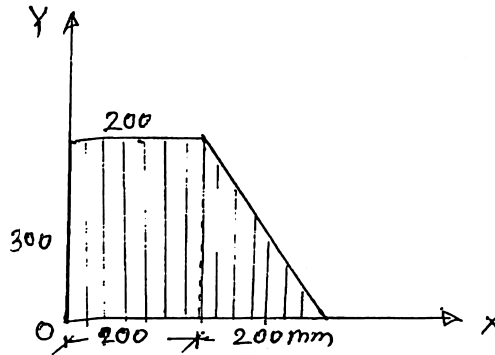
P.T.O.

- 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)

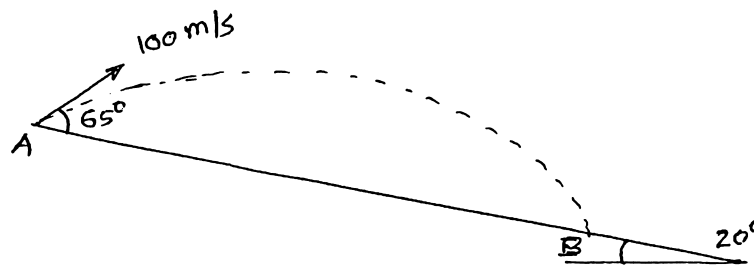


- Q.4 a) What is relation between motion curves for displacement, velocity and acceleration? (03)
 b) A body starts from rest with constant acceleration 3 m/s^2 , draw motion curve up to $t = 10 \text{ sec}$. (07)

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

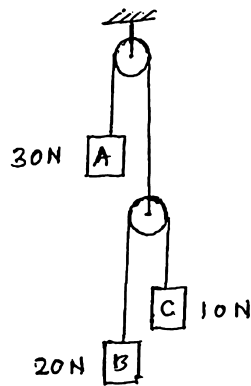
- Q.5 Derive an expression for normal and tangential components of velocity and acceleration. (10)

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)

