B. Tech - Sem-II, (2014, course), IT.

B.Tech. SEM -II (Chemical/ Civil/ Electrical/ Mechanical/ Production/ Computer/ Info. Tech./ Electronics / Bio Medical / E & TC) 2014 Course (CBCS) : WINTER - 2018 Winter-2018

SUBJECT: ENGINEERING MECHANICS

Day: Wednesday
Date: 14/11/2018

W-2018-2270

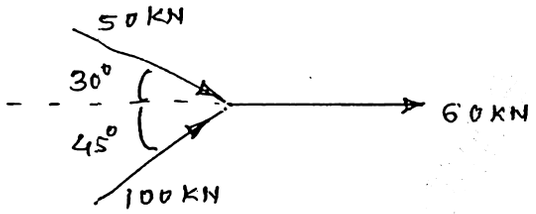
Time: 10.00 AM TO 01.00 PM
Max Marks: 60

N.B:

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

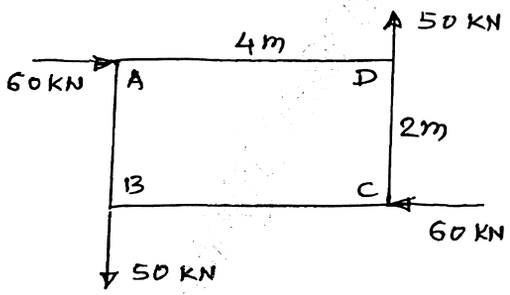
Q.1 a) What are different types of forces? **(03)**

b) Calculate resultant of forces shown in figure. **(07)**



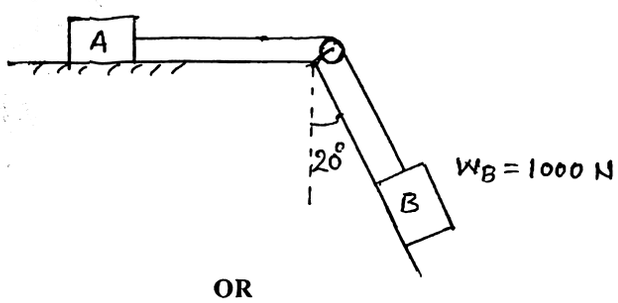
OR

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



Q.2 a) What is impending motion? **(03)**

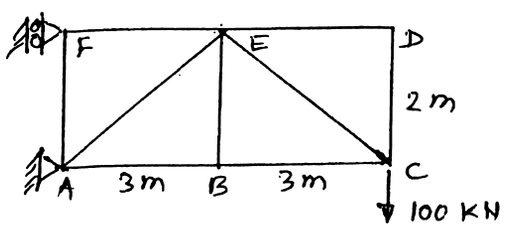
b) Calculate minimum weight of block 'A' for equilibrium. Take $\mu = 0.26$ **(07)**
Neglect friction at pulley.



OR

Q.2 a) What is truss? **(03)**

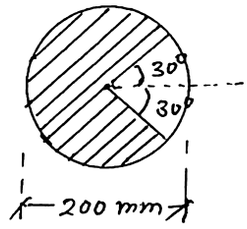
b) Calculate forces in all the members of truss shown in figure. **(07)**



P.T.O.

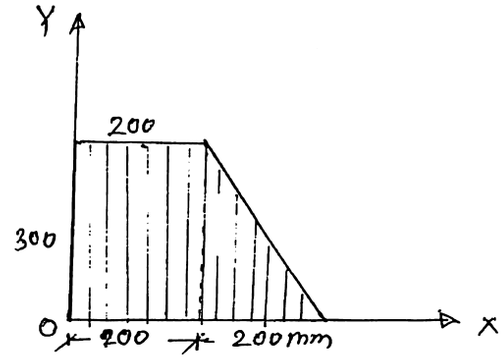
Q.3 **a)** What is radius of gyration? **(03)**

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)**



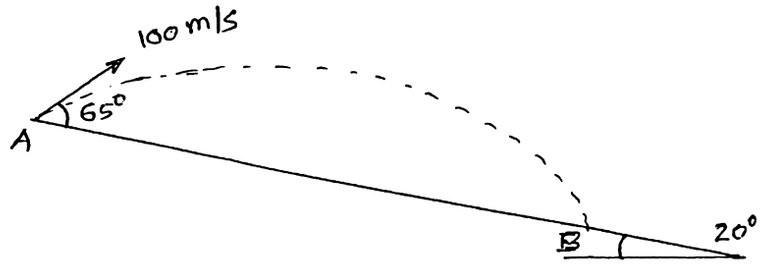
Q.4 **a)** What is relation between motion curves for displacement, velocity and acceleration? **(03)**

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

OR

Q.4 When a cyclist is riding west at 20 kmph, he finds the rain meeting him at an angle 45^0 with vertical. When rides at 12 kmph he meets rain at an angle 30^0 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)**



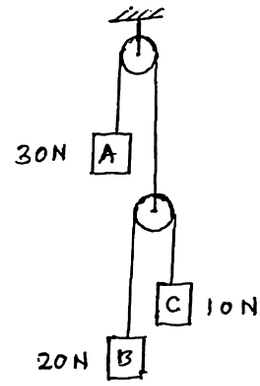
OR

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

P. T. O.

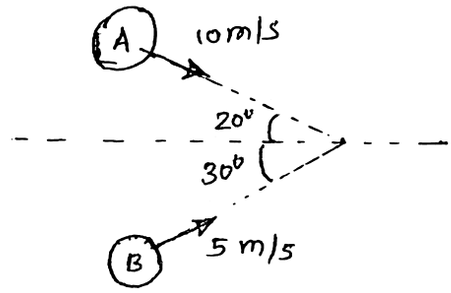
Q.6 a) What is D'Alemberts principle? **(03)**

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)**



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