Total No. of Printed Pages:5

F.E. Semester-I (Revised Course 2007-2008)
EXAMINATION MAY/JUNE 2019
Basic Civil Engineering & Engineering Mechanics

[Duration : 3 Hours] **[Total Marks : 100]**

Instruction :
Please check whether you have got the right question paper.
1. Answer any 5 question minimum one question from each Module
2. Assume additional data if requires and state them clearly
3. Draw neat sketches wherever necessary.

Module-I

Q.1 a) Explain the importance of the following **10**
i) Geotechnical Engineering
ii) FRP as a Building Material

b) Write a note on grade of concrete? **05**
c) Distingues between load bearing structures and framed structures. **05**

Q.2 a) With neat sketch describe the various components of road **10**
b) Write a note on **10**
i) Curing of concrete
ii) Arch bridges

Module-II

Q.3 a) Two cylinders , A=4000N and B = 2000N rest on a smooth inclined surface. They are connected by a bar of negligible weight and is hinged to both the cylinders. Find the force P to be applied so that it holds the system in a given position. **10**

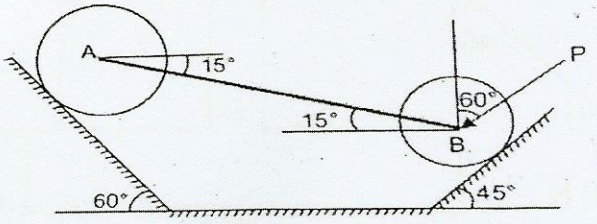

Fig 1 (3a)

b) Find the resultant of the force acting the member? **10**

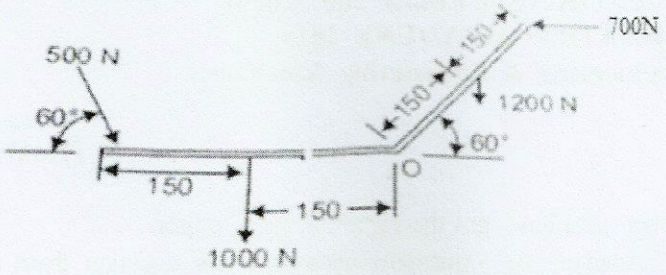

Fig -2 (3b)

Q.4 a) Find the magnitude and direction of reactions at support of the beam? **10**

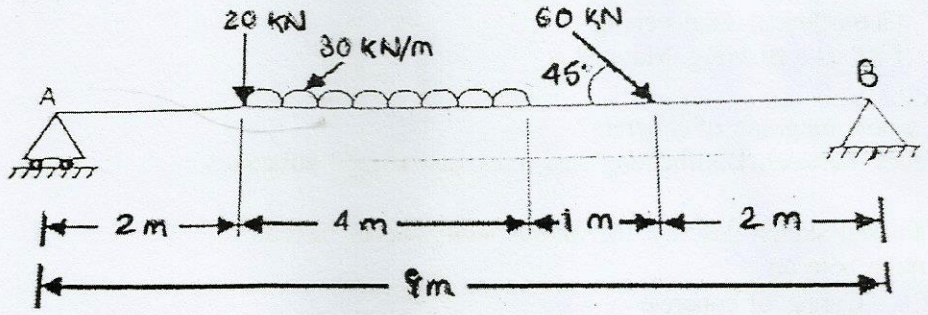

Fig-3(4a)

b) Determine the forces in various segments of the cable load **10**

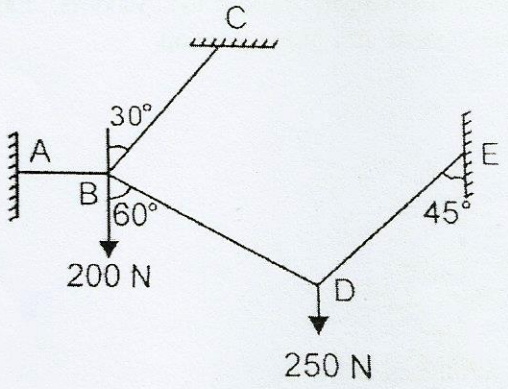

Fig-4(4b)

Module-III

Q.5 a) Determine the moment of inertia about axis AB. Of the shaded area? **10**

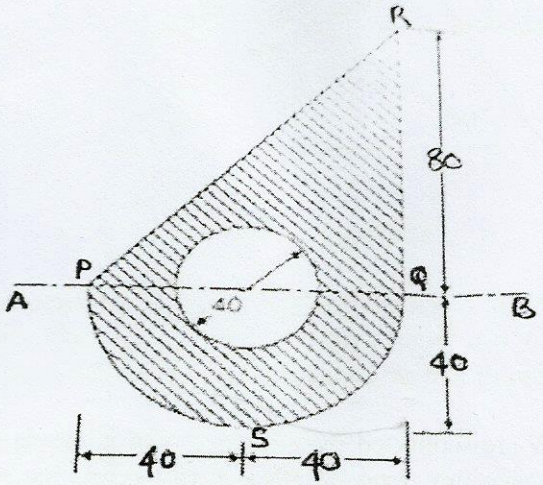

Fig-5(5a)

b) Find the position of the centroid of the shaded area shown. Take x=15mm. **10**

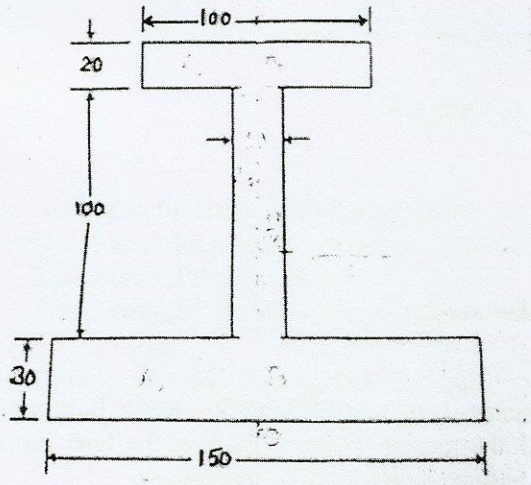

Fig-6(5b)

Q.6 a) The system of bodies will impend at an application of force P. find the force P? Coefficient of friction is 0.2 Assume pulleys to be smooth. **10**

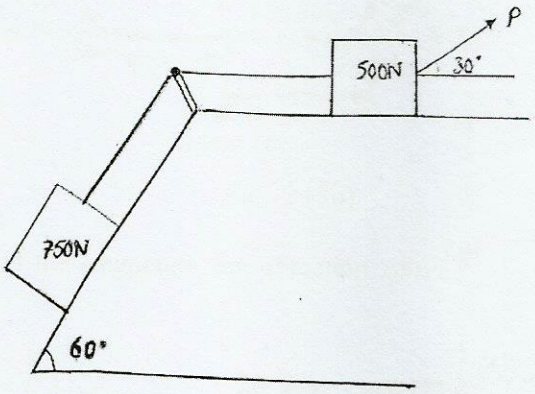

Fig-7(6a)

b) Two identical blocks of weight W are supported by a rod as shown in the fig below . if both the blocks are in limiting equilibrium. Find co-efficient of friction, assuming it to be same at floor as well as the wall. If sliding impends when $\ominus = 45^o$ **10**

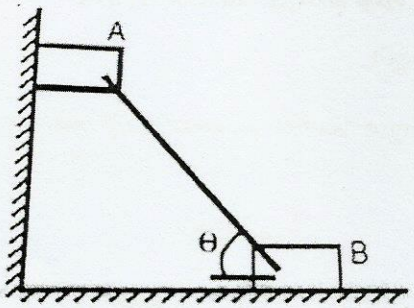

Fig-7(6b)

Module-IV

Q.7 a) Two blocks A and B are placed on incline planes at 30^o and 60o to the horizontal the blocks weigh 2000N and 1800N. find the tension in the string and the time required to attain a velocity of 9.81m/s $\mu = 0.2$ assume pulleys to be frictionless. **10**

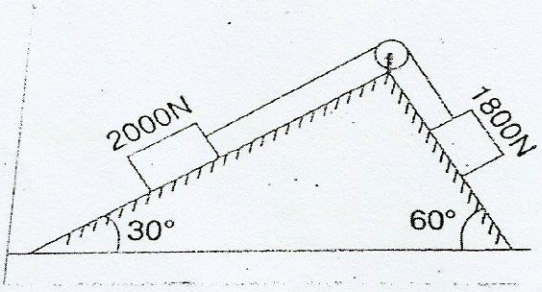

Fig-9(7a)

b) A small block starts from rest at point A sliders down the plane. How much further will the block travel before coming to rest? $\mu = 0.3$ Assume that the block starts to move along BC is the same magnitude as that gained in sliding from A to B. **10**

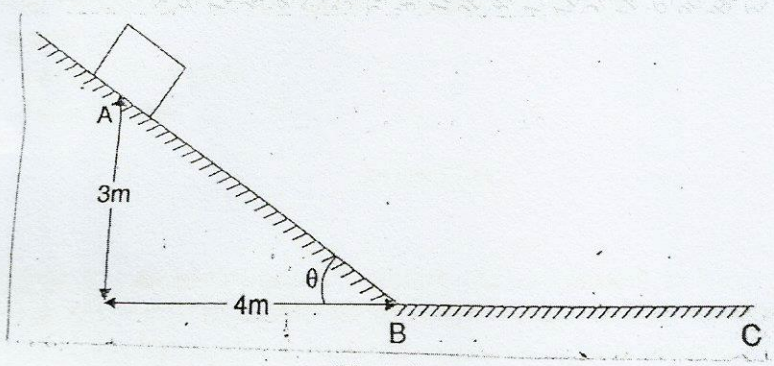

Fig8(7b)

Q.8 a) A Double purchase crab has the following details. **10**
No of teeth on pinion= 15 and 20 , No of teeth on spur wheel =45 and 40 , Diameter of load axel = 150mm, Efficiency = 40%
What load will be lifted by an effort of 250N applied at the end of the handle?

b) Draw a neat sketch of a single purchase crab and derive an expression for velocity ration. **10**