U.S.N. | | | | | | | | | |

BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

July / August 2017 Supplementary Semester Examinations

Course: Structures- I **Duration: 3 hrs**
Course Code: 09AT1DCSTR **Max Marks: 100**
Date: 27.07.2017

Instructions: **Answer five full questions choosing one question from each module**

MODULE - 1

1 a) Determine the resultant of coplanar concurrent force system shown in fig1a **10**

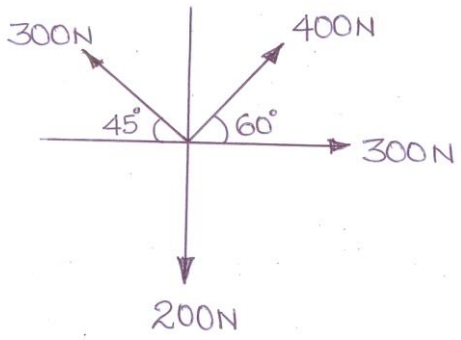

FIG 1a

b) Determine the magnitude, direction and position with respect to A for the system of forces shown in fig 1b **10**

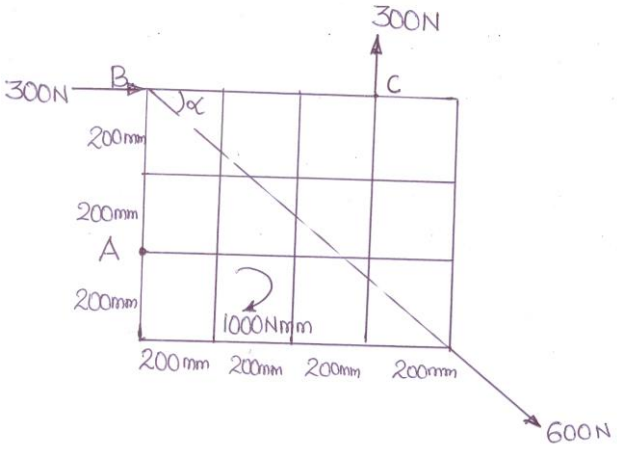

FIG 1b

MODULE - 2

2 a) Explain the different types of loadings and support conditions **08**

b) Determine the reaction at all the surfaces in contact for the arrangement of two cylinders A and B in a trough as shown in fig. Q 2b. The radius and weights of the cylinders are Ra=100mm, Wa=500N, Rb=200mm and Wb=1000N. The width of the trough is 500mm **12**

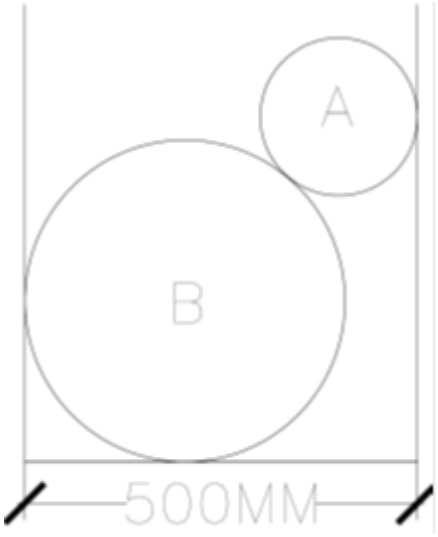

Fig 2b

OR

3 a) Determine the reactions at A and B for the loaded beam shown in fig 3a **10**

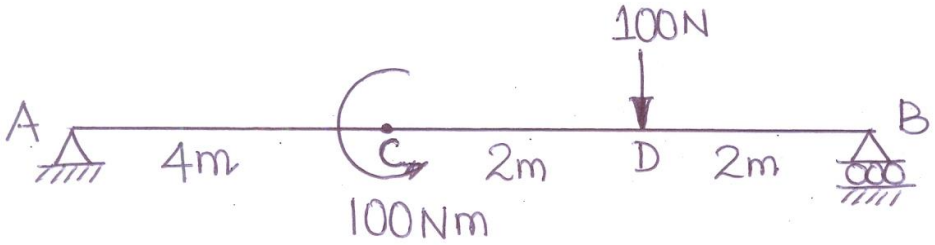

FIG 3a

b) Determine the support reactions of an overhanging beam shown in fig 3b **10**

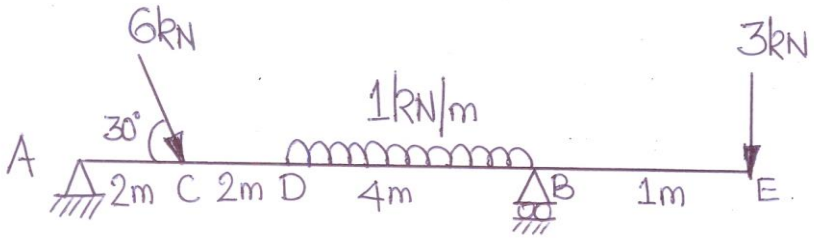

FIG 3b

MODULE - 3

4 a) Explain angle of repose and cone of friction **10**

b) Determine the weight of the block B required to prevent the block A from slipping down the plane for the system of connected blocks shown in fig. Q 4b, Weight of block A is 1000N and the coefficient if friction between the block 'A' and plane is 0.2 and that between block 'B' and the plane is also 0.20. **10**

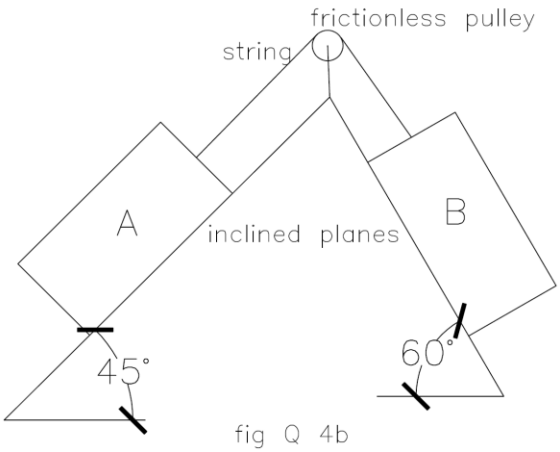

fig Q 4b

OR

5 a) A ladder of length 5m and weight 120N is placed on a flat floor against the vertical wall as shown in fig 5a. If the coefficients of friction are 0.3 and 0.2 and the ladder is considered homogeneous, determine the smallest angle the ladder can be placed at the floor for equilibrium **10**

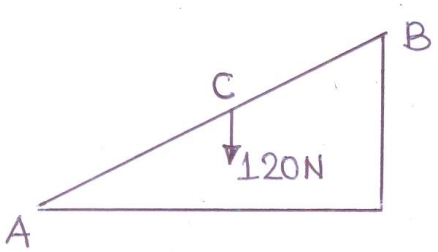

FIG 5a.

b) A block weighing 1000N is placed on a 30^0 incline with a coefficient of friction of 0.25 as shown in fig 5b. Determine the horizontal force to be applied on it in order to keep it in equilibrium at rest **10**

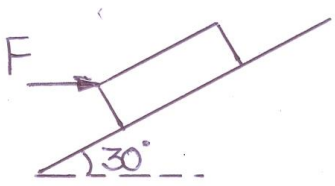

FIG 5b

MODULE - 4

6 a) Determine the Centroid for a rectangular section **10**

b) Locate the Centroid of the lamina shown in fig 6b with respect to point A **10**

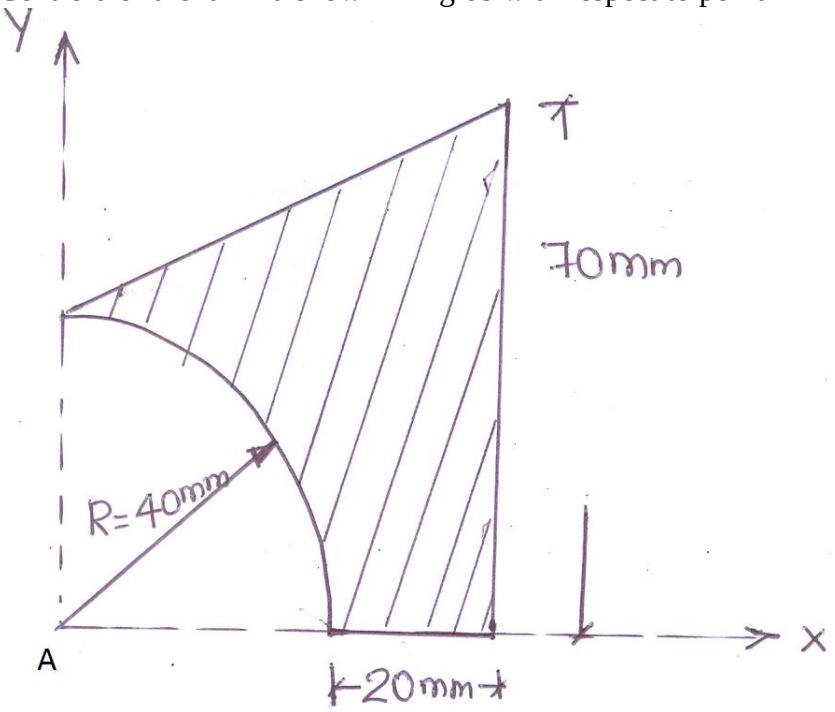

FIG 6b.

MODULE - 5

7 a) Determine the Moment of inertia for triangle **08**

b) Determine the Moment of inertia of unequal section shown in fig 7 b w.r.t centroidal x-x axis only **12**

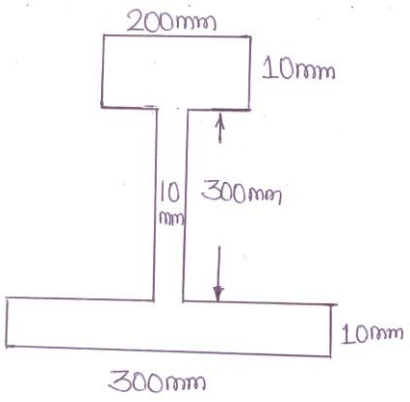

FIG 7b

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