(Please write your Exam Roll No.) Exam Roll No. 01615802818

END TERM EXAMINATION

SECOND SEMESTER [B.TECH] APRIL – MAY 2019

Paper Code: ETME-110 **Subject: Engineering Mechanics**

(Batch-2013 Onwards)

Time : 3 Hours **Maximum Marks :75**

Note: Attempt five questions in all including question no.1 which is compulsory. Select one question from each unit.

Q1 Attempt each one of the following:- (2.5x10=25)

(a) State principle of transmissibility of force.
(b) What is meant by equilibrant?
(c) State and prove Lami's theorem.
(d) Derive the equation for the centroid of quarter circle.
(e) Distinguish between simply supported truss and cantilever truss.
(f) What is the use of wedge?
(g) Distinguish between rectilinear motion and curvilinear motion.
(h) Explain the behavior of a rolling body.
(i) What is impulsive force?
(j) What is the relation between shear force and bending moment?

UNIT-I

Q2 Three cylinders are piled up in a rectangular channel as shown in Fig 1. Determine the reactions at point 6 between the cylinder A and the vertical wall of the channel. (12.5)

(a) Cylinder A : radius = 4 m, m = 15 kg
(b) Cylinder B : radius = 6 m, m = 40 kg
(c) Cylinder C : radius = 5 m, m = 20 kg

Q3 Derive the relation $T1/T2 = e^{\mu\theta}$. (12.5)

UNIT-II

Q4 For the truss shown in Fig 2, calculate the force in members BD, BE and CE by the method of section only. (12.5)

Q5 Fig. 4 shows a plane area. Find the M. I. of the section about x-x and y-y axis passing through the C.G. of the section. (12.5)

UNIT-III

Q6 Derive the expression for coefficient of restitution. (12.5)

Q7 The crank BC of a slider crank mechanism is rotating at constant speed of 30 rpm as shown in Fig. 5 clockwise. Determine the velocity of the cross head A at the given instant. (12.5)

UNIT-IV

Q8 Draw the shear force diagram and bending moment diagram for the beam loaded as shown in Fig 3. (12.5)

Q9 Determine the minimum weight of block required to keep the beam in horizontal equilibrium as shown in Fig 6. Assume rough pulley with coefficient of friction as 0.2. (12.5)

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P.T.O.

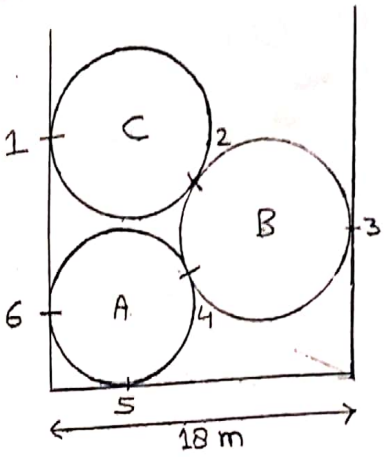

FIG. 1

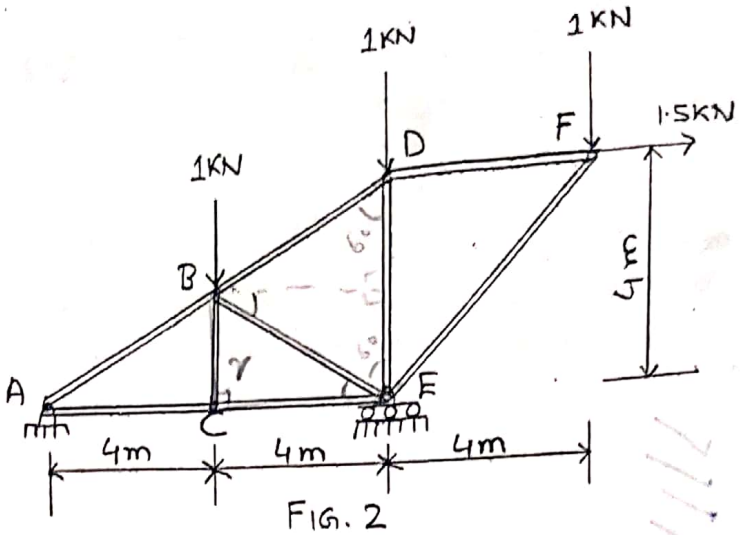

FIG. 2

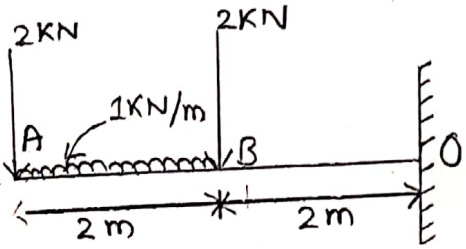

FIG. 3

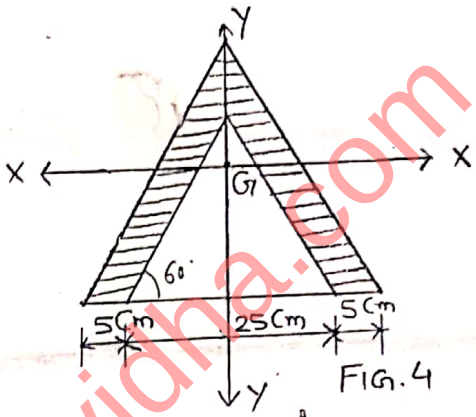

FIG. 4

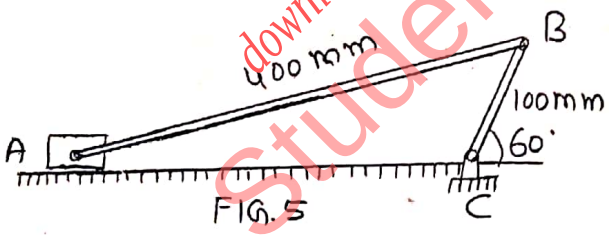

FIG. 5

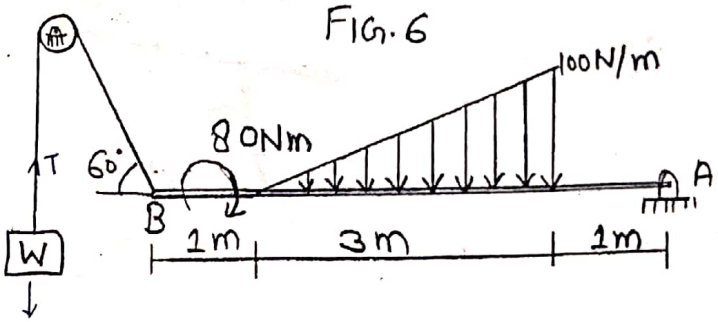

FIG. 6

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