Exam.Code:0905
Sub. Code: 6649

1108
B.E. (Electrical and Electronics Engineering)
First Semester
ME-101: Engineering Mechanics – I
(Common with ECE)

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part. Assume any missing data suitably. Supplement your answers with neat and labeled sketches wherever required.*

x-x-x

1 (i) Differentiate between engineering mechanics and dynamics. (2)

(ii) Differentiate between rigid body and elastic body with examples. (2)

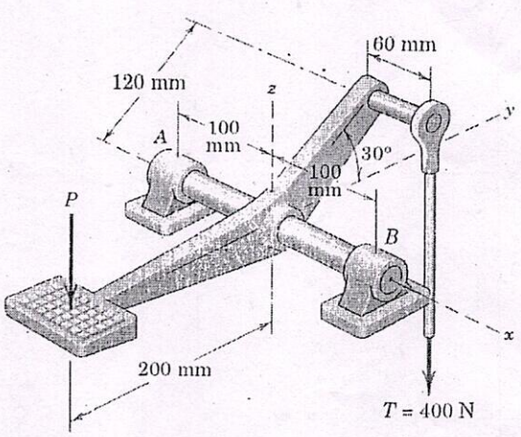
(iii) Draw and explain the concept of zero-force member by taking an example. (2)

(iv) What are main characteristics of dry friction? (2)

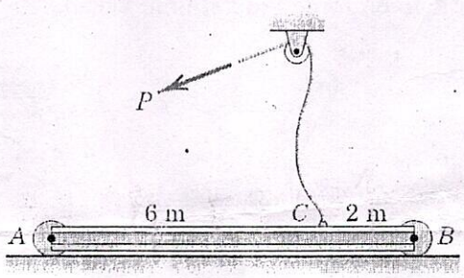
(v) Differentiate between virtual work and actual work. (2)

Part-A

2 As shown in next figure, a vertical force P on the foot pedal of the bell crank is required to produce a tension T of 400 N in the vertical control rod. Determine the corresponding bearing reactions at A and B. (10)

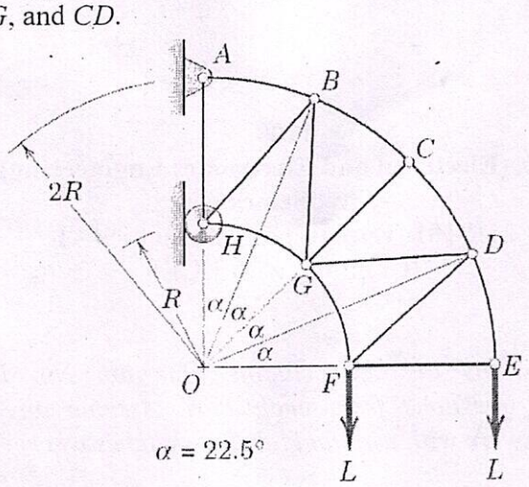


3 The uniform 100-kg I-beam is supported initially by its end rollers on the horizontal surface at A and B. By means of the cable at C it is desired to elevate end B to a position 3 m above end A. Determine the required tension P, the reaction at A, and the angle θ made by the beam with the horizontal in the elevated position. (10)



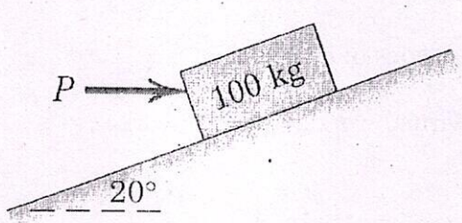
P.T.O.

4 The simple truss shown supports the two loads, each of magnitude L. Determine the forces in members DE, DF, DG, and CD. (10)

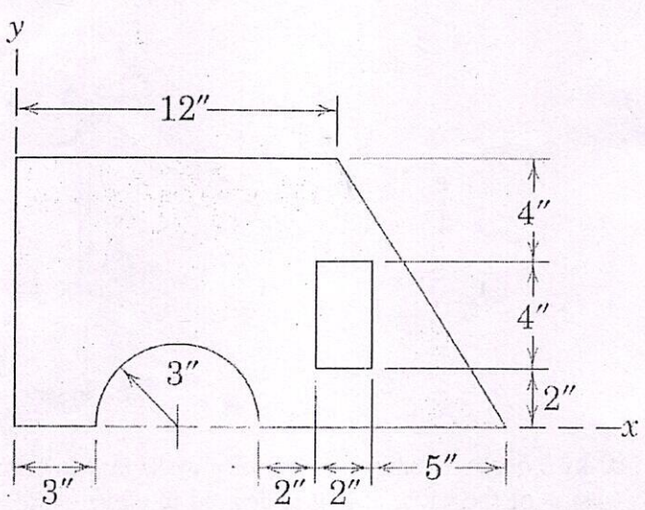


Part-B

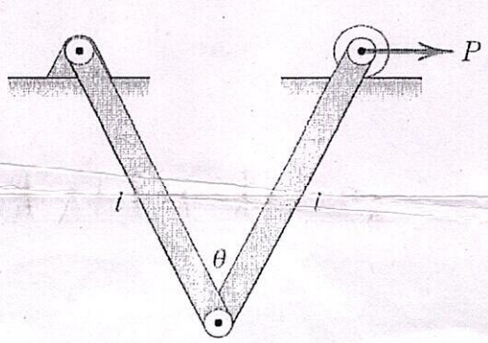
5 Determine the magnitude and direction of the friction force acting on the 100-kg block shown if, first, P = 500 N and, second, P = 100 N. The coefficient of static friction is 0.20, and the coefficient of kinetic friction is 0.17. The forces are applied with the block initially at rest. (10)



6 Locate the centroid of the shaded area shown next. (10)



7 Each of the two uniform hinged bars has a mass m and a length l, and is supported and loaded as shown. For a given force P determine the angle θ for equilibrium. (10)



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