

NEW SCHEME

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First/Second Semester B.E Degree Examination, July/August 2004

Common to all Branches except Architecture

Elements of Civil Engineering

Time: 3 hrs.]

[Max.Marks : 100

- Note:** 1. Answer any FIVE full questions.
 2. Missing data if any may suitably assumed and indicated.
 3. Answer must be specific and precise.
 4. Draw neat sketches wherever necessary.

1. (a) Explain briefly the various civil engineering infra-structures systems required for the socio-economical development of a country. (6 Marks)
 (b) What are the qualities of good building stones? (8 Marks)
 (c) List the properties of a good mortar. (6 Marks)
2. (a) Briefly explain the qualities of good bricks. (8 Marks)
 (b) List the desirable properties of timber. (6 Marks)
 (c) What are composite materials? State their applications. (6 Marks)
3. (a) Explain the basic principles of surveying. (8 Marks)
 (b) Write a note on remote sensing and its applications. (6 Marks)
 (c) Write a note on the properties of cement concrete. (6 Marks)
4. (a) Explain the principle of transmissibility. (4 Marks)
 (b) Explain i) Free body diagram (4 Marks)
 ii) Rigid body (4 Marks)
 (c) The 26kN force is the resultant of two forces. One of which is as shown in fig1. Determine the other force. (12 Marks)
5. (a) State and prove Varigon's theorem. (4 Marks)
 (b) State the conditions of equilibrium for coplanar nonconcurrent force system. (4 Marks)
 (c) Determine the tension in the string BC and the reaction at the hinged support D for the beam ABD shown in fig2 in equilibrium. (12 Marks)
6. (a) Locate the centroid of a semi-circular area of radius 'r' from first principles. (6 Marks)
 (b) Locate the centroid of the area shown in Fig.3. All dimensions are in mm. (14 Marks)
7. (a) State and prove parallel axis theorem. (6 Marks)
 (b) Find the polar radius of gyration for the area shown in fig4. All dimensions are in mm. (14 Marks)
8. (a) Explain i) Angle of friction (6 Marks)
 ii) Cone of friction (6 Marks)

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(b) A ladder of 4m weighing 200N is supported by a horizontal floor and vertical wall as shown in Fig.5. If a man of weight 650N climbs to the top of the ladder, determine the inclination of the ladder with reference to the floor at which the ladder is to be placed to prevent slipping. Take $\mu = 0.25$ for all contact surfaces. (14 Marks) .

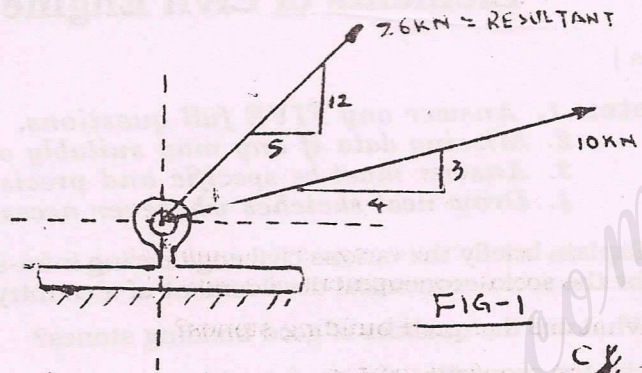


FIG-1

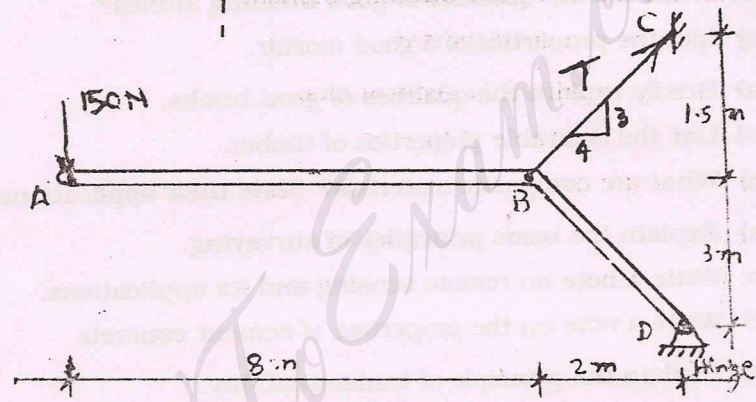


FIG-2

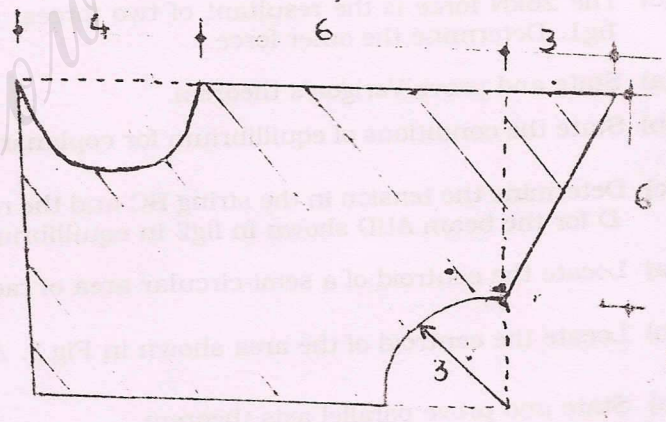


FIG-3

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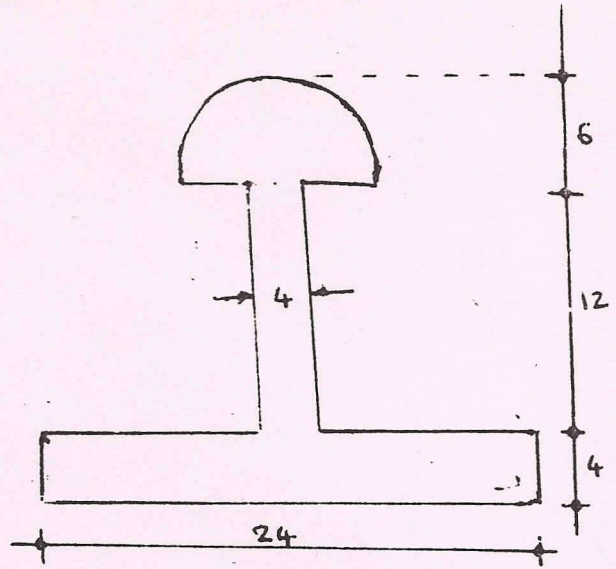


FIG-4

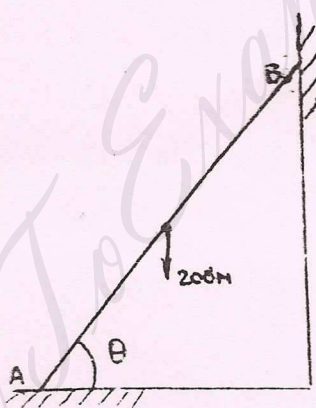


FIG-5

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