

NEW SCHEME

USN

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**First/Second Semester B.E Degree Examination,
July/August 2005**

**Common to all Branches except Architecture
Elements of Civil Engineering**

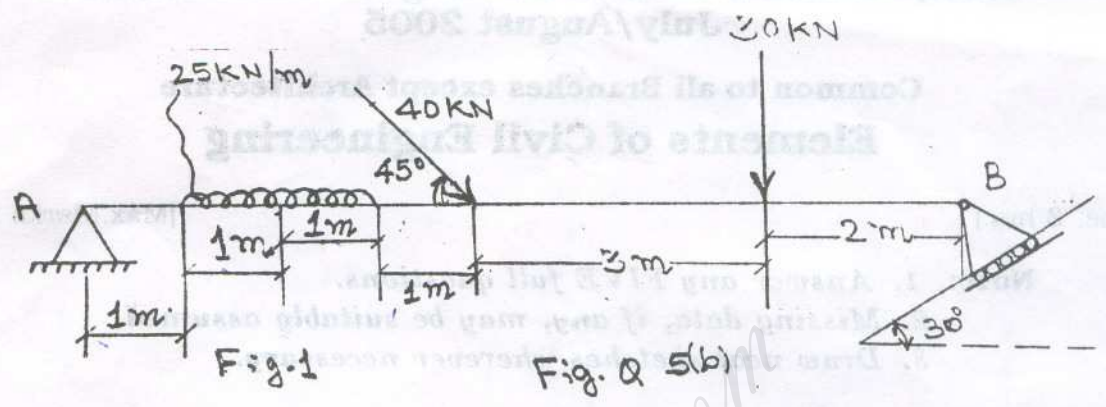
Time: 3 hrs.]

[Max.Marks : 100

- Note:** 1. Answer any FIVE full questions.
 2. Missing data, if any, may be suitably assumed.
 3. Draw neat sketches wherever necessary.

1. (a) Explain the impact of infrastructure development on the socio-economic progress of the country. (8 Marks)
 (b) Briefly explain the terms planning, scheduling and project management. (3×4 Marks)
2. (a) Explain in detail the properties and uses of stones. (6+6 Marks)
 (b) Explain the properties of fresh concrete and list specific uses of plain concrete and reinforced concrete. (4+4 Marks)
3. (a) What are composite materials ? List the uses of composite materials. (2+4 Marks)
 (b) What is a total station ? What are the advantages of using total station? (2+4 Marks)
 (c) Write a brief note on remote sensing and Geographic Information system (GIS). (4+4 Marks)
4. (a) Define the following system of forces with an example observed in real practice
 - i) Coplanar concurrent forces
 - ii) Non coplanar concurrent forces
 - iii) Non coplanar non concurrent forces (6 Marks)
 (b) Define principle of transmissibility of forces and explain its limitation. (4 Marks)
 (c) Five guy wires tied at a point and are pulled in radial directions, equally spaced from one another. If the magnitude of pulls on three consecutive wires is $50kN$, $70kN$ and $60kN$, determine the magnitude of pulls on two other wires. (10 Marks)

- 5. (a) Explain with neat sketches the different types of supports used in practice. (8 Marks)
- (b) Determine the reactions at points A and B for the beam loaded as shown in fig. 1. (12 Marks)



- 6. (a) Differentiate between centroid and centre of gravity. (3 Marks)
- (b) Locate the centroid of a quarter circle of radius R from first principles. (7 Marks)
- (c) Locate the centroid of the shaded area shown in fig. 2

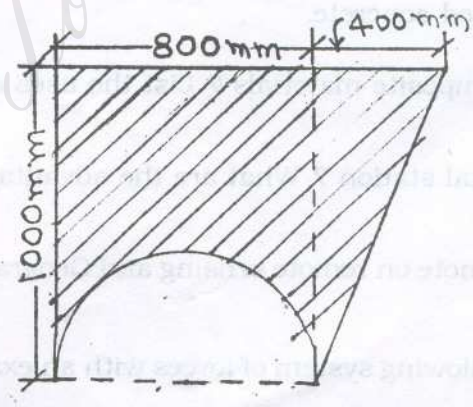


Fig.2

Fig. Q 6(c)

- 7. (a) Define polar moment of inertia and radius of gyration and mention their units. (4 Marks)

- (b) Determine the moment of inertia of the area shown in fig 3 about the axes AB and PQ.

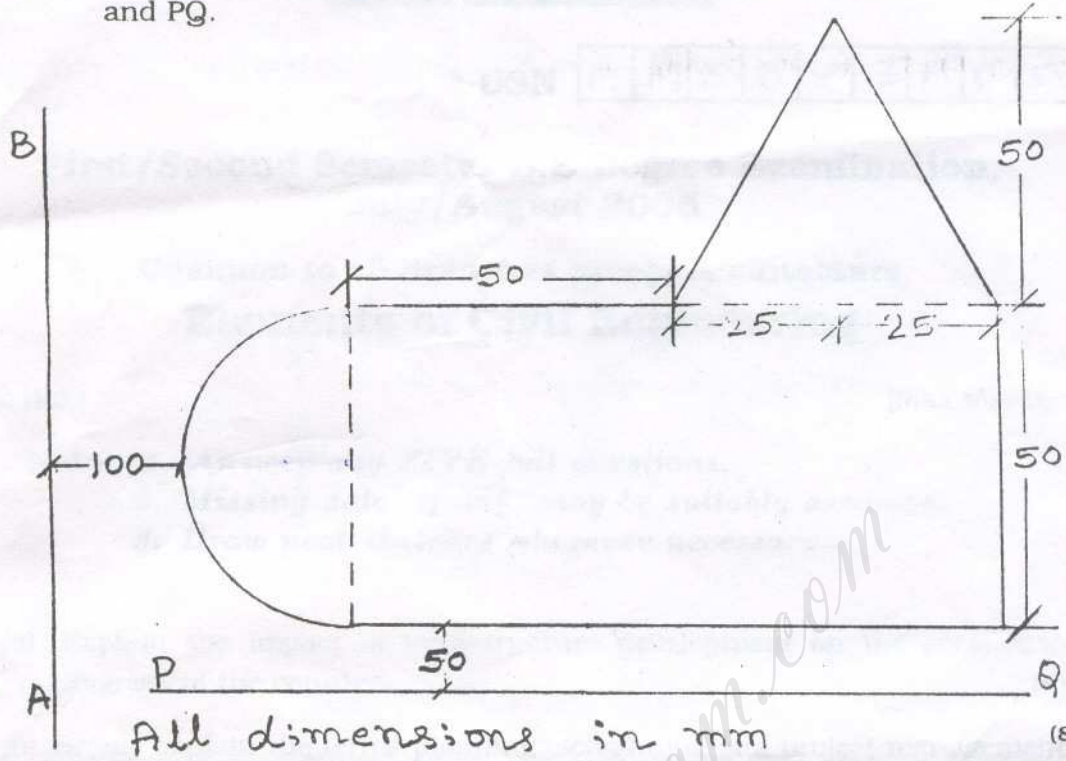


Fig. 8 (b)

Fig. 3

All dimensions in mm

(8+8 Marks)

- 8. (a) Prove the relationship $\mu = \tan\phi$, if μ is coefficient of friction and ϕ is angle of limiting friction. (3 Marks)
- (b) Explain the terms angle of repose and cone of friction. (6 Marks)
- (c) Two blocks A and B weighing $2kN$ and $1.5kN$ are connected by a wire passing over a smooth frictionless pulley as shown in fig. 4. Determine the magnitude of force P required to impend the motion, taking $\mu = 0.2$

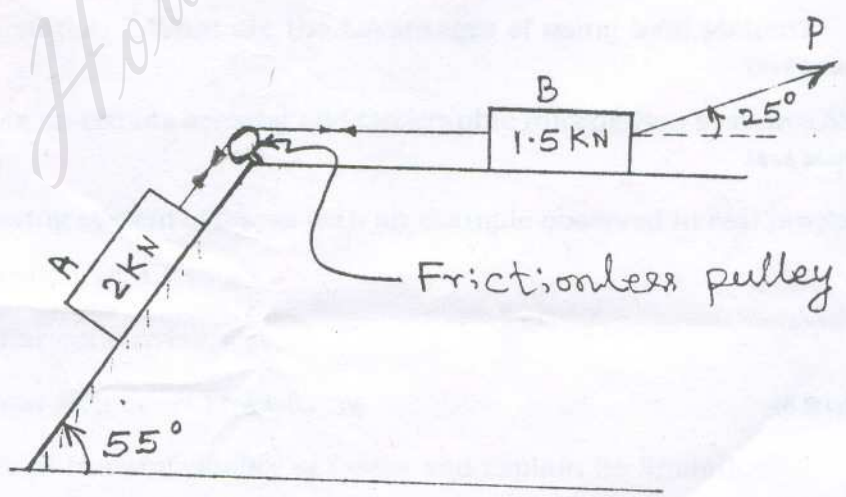


Fig. 4

Fig. Q 8 (c)

(11 Marks)

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