

**NEW SCHEME**

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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

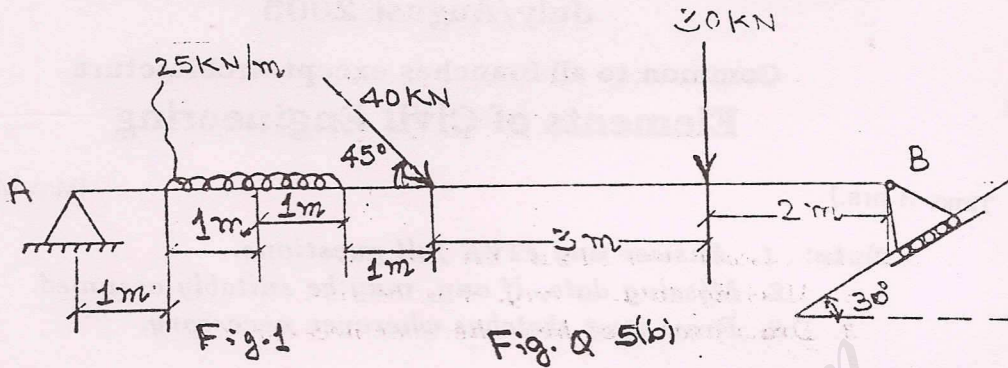
- Note:** 1. Answer any FIVE full questions.  
 2. Missing data, if any, may be suitably assumed.  
 3. Draw neat sketches wherever necessary.

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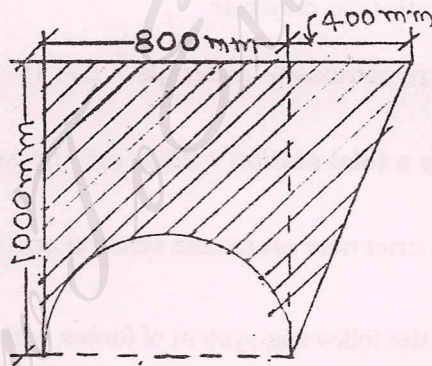
1. (a) Explain the impact of infrastructure development on the socio-economic progress of the country. (8 Marks)
- (b) Briefly explain the terms planning, scheduling and project management. (3 x 4 Marks)
2. (a) Explain in detail the properties and uses of stones. (6+6 Marks)
- (b) Explain the properties 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



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

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

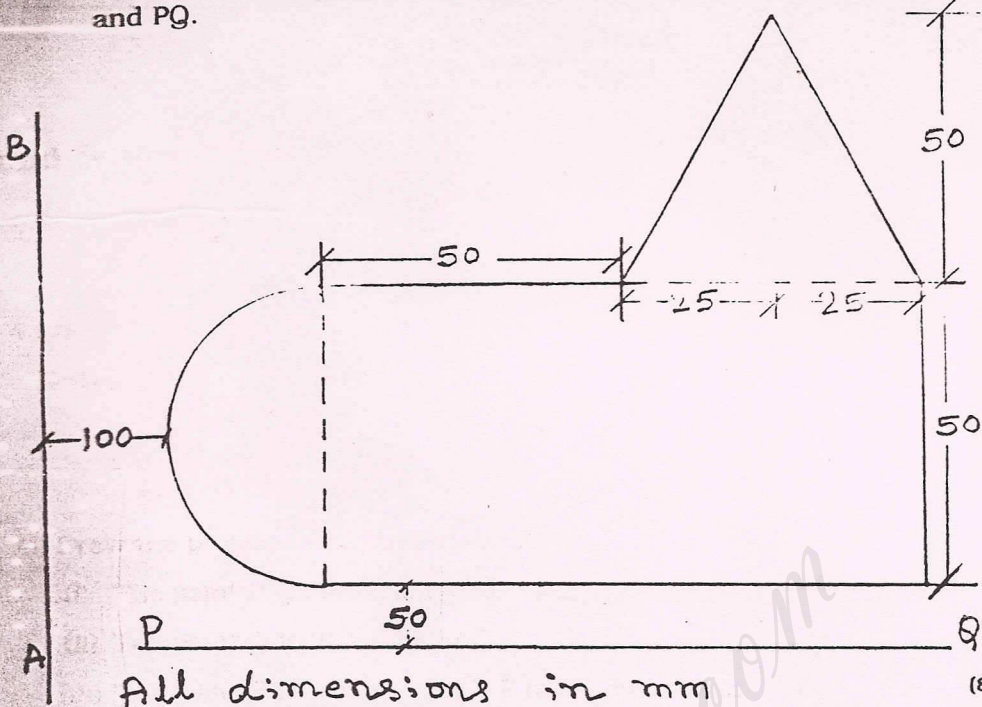


Fig. 8 (b)

Fig. 3

All dimensions in mm (8+8 Marks)

8. (a) Prove the relationship  $\mu = \tan \phi$ , if  $\mu$  is coefficient of friction and  $\phi$  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  $\mu = 0.2$

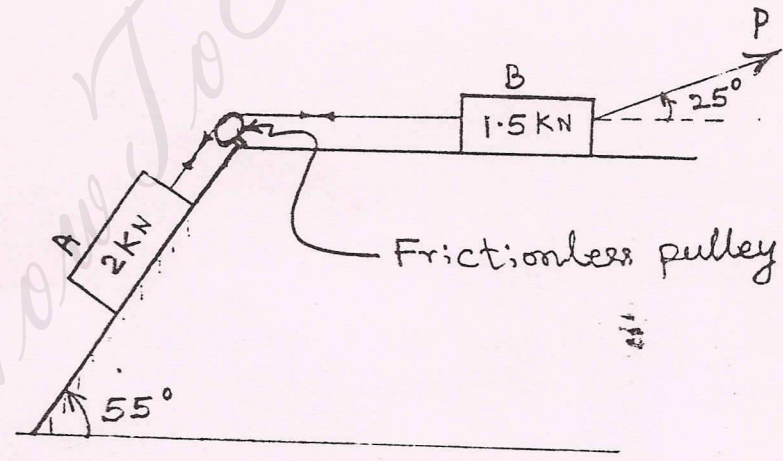


Fig. 4

Fig. Q 8 (c)

(11 Marks)

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