NEW SCHEME

CIV13/23

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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)**

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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)**

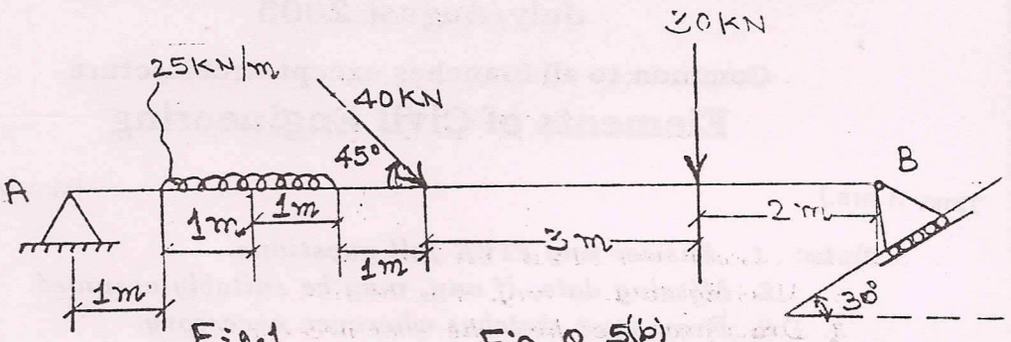

Fig.1 Fig. Q 5(b)

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

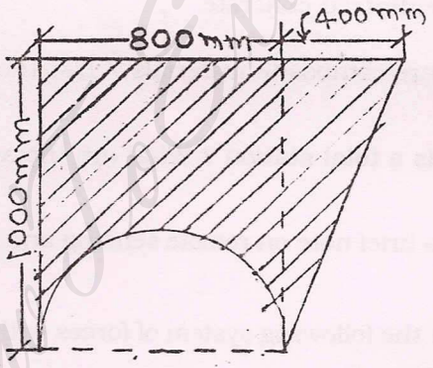

Fig.2 Fig.Q 6(c)

(10 Marks)

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

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

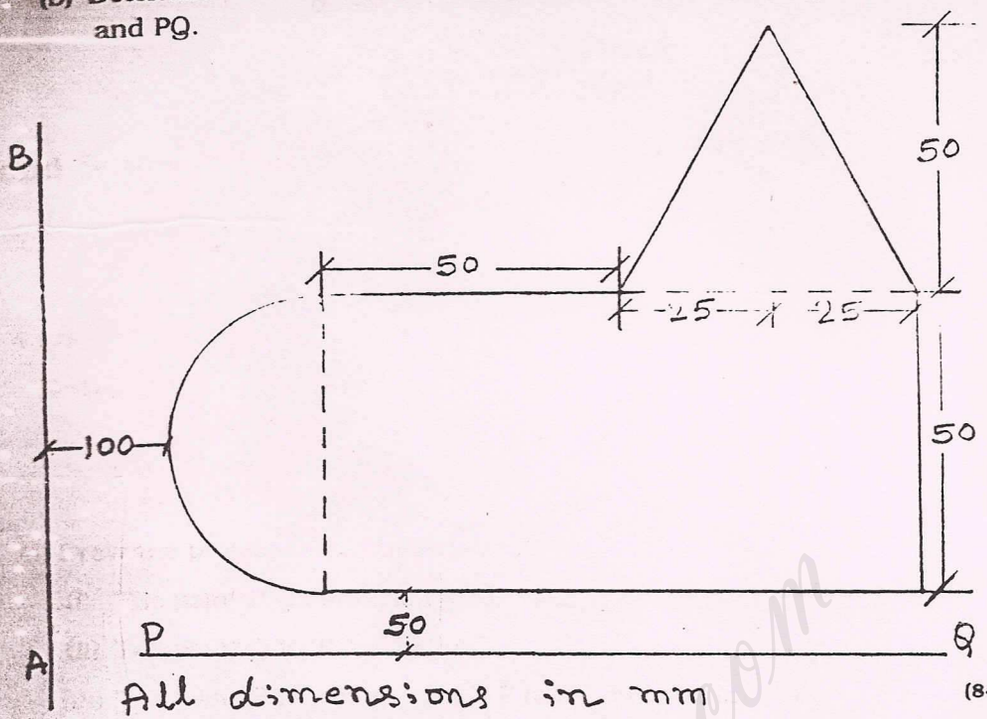

Fig. 3

(8+8 Marks)

3 Marks)

7 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 $\mu = 0.2$

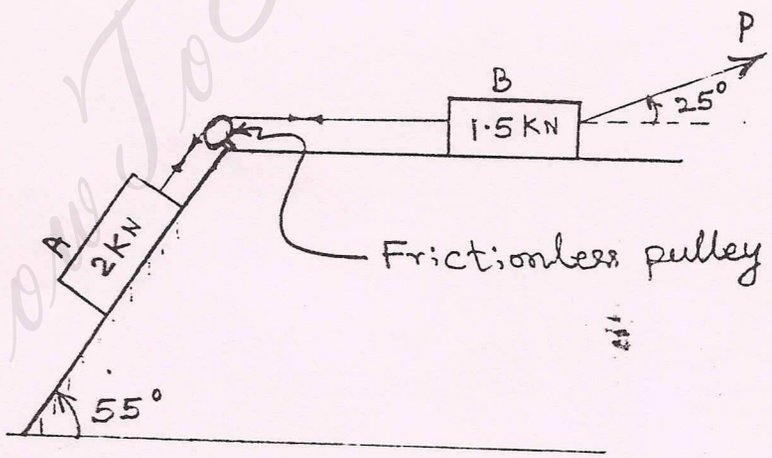

Fig. 4

Fig. Q 8 (c)

(11 Marks)

Marks)

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