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NEW SCHEME

First / Second Semester B.E. Degree Examination, July 2006
Common to All Branches
Elements of Civil Engineering

Time: 3 hrs.] [Max. Marks:100

Note: *1. Answer any FIVE questions.*

1 a. Discuss briefly the impact of infrastructural development on the economy and environment. **(10 Marks)**

b. Explain briefly the terms planning, scheduling and construction management. **(10 Marks)**

2 a. State any ten properties of good timber. **(10 Marks)**

b. Give the applications of polymer matrix composites (PMC) in civil engineering. **(05 Marks)**

c. Write an explanatory note on smart materials in civil engineering. **(05 Marks)**

3 a. Discuss briefly GPS and its applications. **(10 Marks)**

b. Give explanatory notes on remote sensing and GIS. **(10 Marks)**

4 a. State and prove Varignon's theorem. **(05 Marks)**

b. Explain different types of force system with examples. **(05 Marks)**

c. Determine the magnitude, direction and position of resultant force with reference to point 'A' for the non-coplanar force system shown below in Fig.1(c) **(10 Marks)**

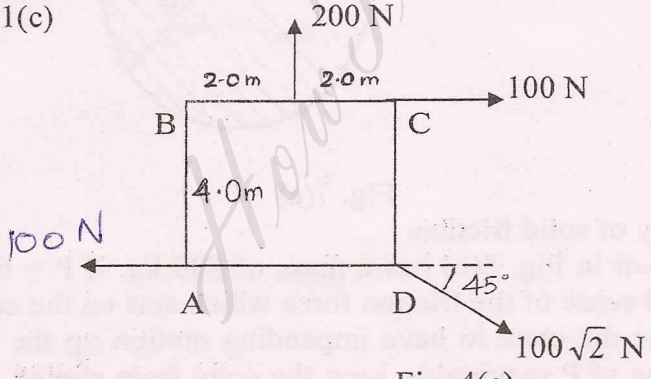

Fig. 4(c)

5 a. State and prove Lamis theorem. **(05 Marks)**

b. Distinguish :
i) Hinged support
ii) Roller support
iii) Fixed support. **(05 Marks)**

c. Find the support reactions at A and B for the beam loaded as shown below in Fig. 5(c) **(10 Marks)**

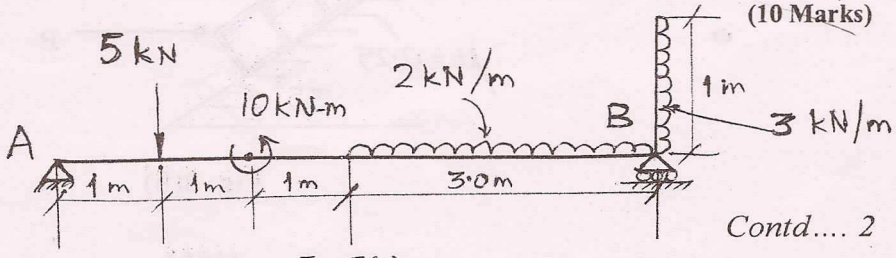

Fig. 5(c)

Contd.... 2

6 a. Locate the centroid of a parabolic segment having an equation $y = Kx^2$ from first principles. **(07 Marks)**

b. State parallel axis theorem. **(03 Marks)**

c. Determine centroid of the shaded area with reference apex. **(10 Marks)**

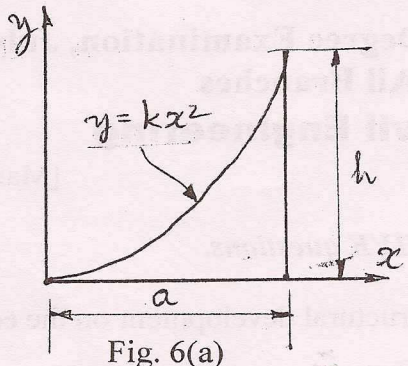

Fig. 6(a)

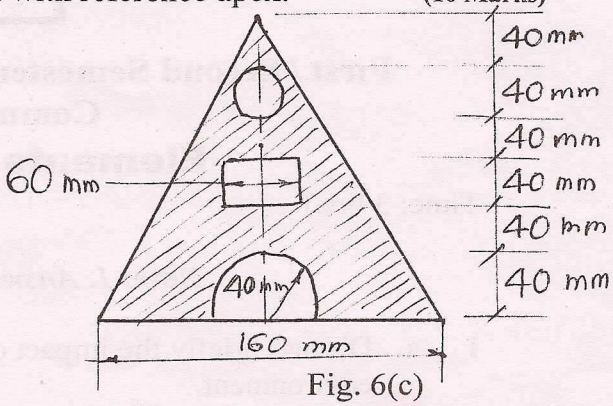

Fig. 6(c)

7 a. Determine the moment of inertia of a square lamina of side 'a' about on axis passing through its diagonal. **(06 Marks)**

b. Find the centroid of the area enclosed by a right angles triangle from first principle. **(04 Marks)**

c. Determine the moment of inertia of the shaded area about the axis A-A. **(10 Marks)**

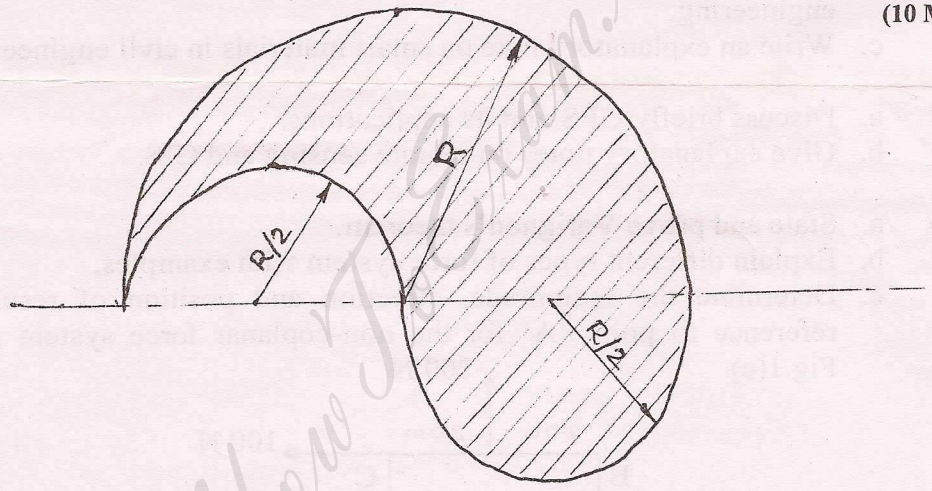

Fig. 7(c)

8 a. Give the theory of solid friction. **(08 Marks)**

b. The crate shown in Fig. 8(b) has a mass of 580 kg. if P = 6000 N, find the magnitude and sense of the friction force which acts on the crate. What value of P will cause the crate to have impending motion up the plane? Find the minimum value of P required to keep the crate from sliding down the plane. For what range of values of P will the crate remain in the equilibrium position shown in Fig. 8(b)? **(12 Marks)**

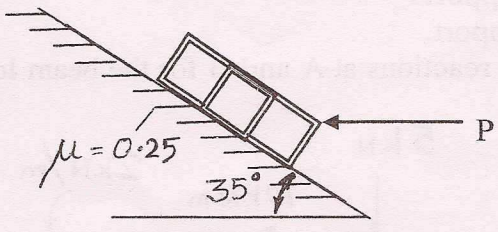

Fig. 8(b)

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