CBCS Scheme

USN | | | | | | | | | | |

15CIV13

First Semester B.E. Deg ion, Dec.2015/Jan.2016
Elements of Civil Engineering & Engineering Mechanics

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Briefly explain the scope of any four fields of civil engineering. **(08 Marks)**

b. Draw typical cross section of road and explain its components. **(08 Marks)**

OR

2 a. Write short notes on: i) Shoulders ii) Kerbs iii) Traffic separators. **(06 Marks)**

b. Resolve 300 N force acting on a block as shown in Fig. Q2 (b):
i) Into horizontal and vertical components.
ii) Along the inclined plane and right angles to the plane. **(10 Marks)**

Module-2

3 a. State and prove Lami's theorem. **(06 Marks)**

b. Determine the resultant of forces which are acting as shown in the Fig.Q3 (b). **(10 Marks)**

OR

4 a. State and prove Parallelogram law of forces. **(10 Marks)**

b. Explain with sketches : i) Cone of friction ii) Angle of repose. **(06 Marks)**

Module-3

5 a. State and prove Varignon's theorem. **(06 Marks)**

b. Find the magnitude, direction and position of the resultant with respect to the point A for the force system shown in Fig. Q5 (b). **(10 Marks)**

OR

6 a. Explain the different types of supports in the analysis of beams. **(06 Marks)**

b. Determine the support reaction at A and B for the beam shown in Fig. Q6 (b). **(10 Marks)**

Module-4

7 a. State and prove parallel axis theorem. **(08 Marks)**

b. Determine Centroid of the area shown in Fig. Q7 (b). **(08 Marks)**

OR

8 a. Determine the moment of inertia and radii of gyration of the area shown in Fig. Q8 (a) about the base AB and centroidal axis parallel to AB. **(08 Marks)**

b. Determine the moment of inertia of triangle of base width 'b' and height 'h' about the base. **(08 Marks)**

Module-5

9 a. Define : i) Displacement ii) Speed iii) Velocity iv) Acceleration. **(06 Marks)**

b. A cricket ball thrown from a height of 1.8 m above ground level at an angle of 30° with the horizontal witl aught by fielder at a height of 0.6 m above the ground. Deterr two players. **(10 Marks)**

10 a. A stone is dropped into a well and a sound of splash is heard after 4 s. Find the depth of well. **(08 Marks)**

b. Determine the position at which the ball in thrown up the plane will strike the inclined plane as shown in Fig. Q10 (b). The initial velocity is 30 m/s and angle of projection is $\tan^{-1}\left(\frac{4}{3}\right)$ with horizontal. **(08 Marks)**

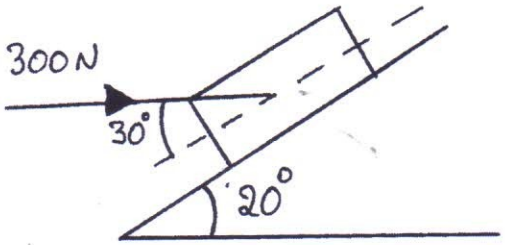

Fig. Q2 (b)

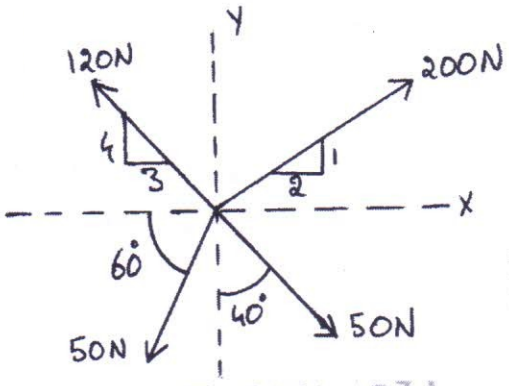

Fig. Q3 (b)

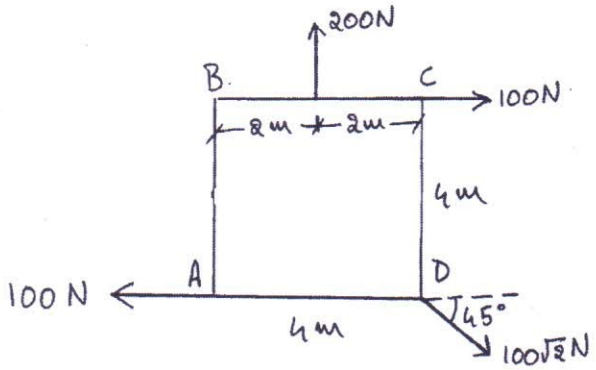

Fig. Q5 (b)

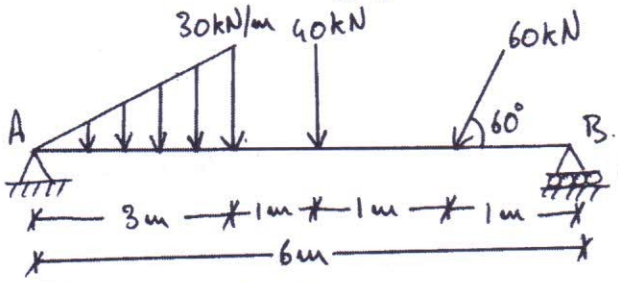

Fig. Q6 (b)

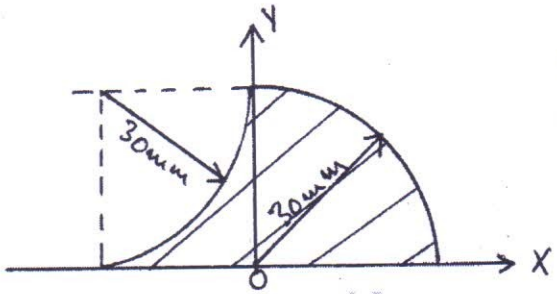

Fig. Q7 (b)

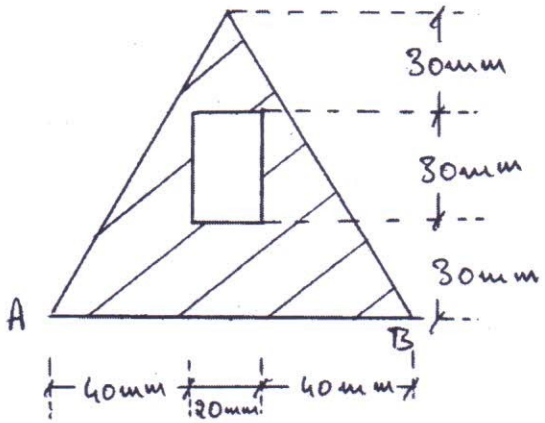

Fig. Q8 (a)

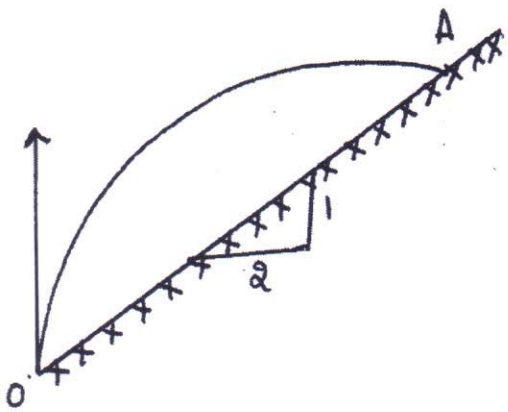

Fig. Q10 (b)

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