Roll No. ……………..

24048

B. Tech. 3rd Sem. Mechanical Engg.
Branch – VII
Examination – December, 2011

ENGINEERING MECHANICS

Paper : ME-205-F

Time : Three hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in total at least *one* question from each Section. *Q.* 1 *is compulsory.*

1. (a) Define moment of a force about a point and axis.

    2

   (b) Differentiate Static and Dynamics equilibrium.   2

   (c) Classify Truss.   2

   (d) Define Centroid and Centre of of gravity.   2

   (e) What is theorem of perpendicular axis.   2

   (f) Define share force and Bending Moment.   2

   (g) Classify Beams.   2

   (h) Explain parallel axis theorem.   2

24048-8,200-(P-4)(Q-9)(11)   P. T. O.

(i) Differentiate Linear and angular momentum with the help of equation. 2

(j) What are different types of Loads in Beam. 2

SECTION – A

2. A smooth circular cylinder of radius 1.5 m is lying in a triangular groove, one side of which makes 15° angle and the other 40° angle with the horizontal. Find the reaction at the surfaces of contract if there is no friction & cylinder weight 100 N. (fig a). 20

fig (a)
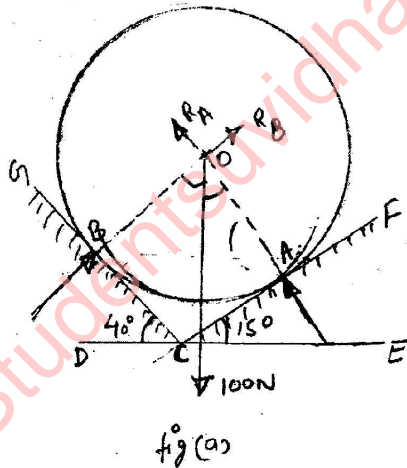
3. Find the magnitude of the resultant force if 30, 40, 50 and 60 N forces are acting along the lines joining the centre of a square to its vertices. 20

SECTION – B

4. Fig (b) shows a Warren girder consisting of seven members each of 3 m length freely supported at its

24048-8,200-(P-4)(Q-9)(11)   (2)

ends. The girder is loads at B & C as shown. Find the forces in all members of the girder by method of Joints. 20

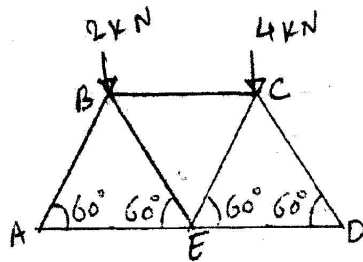fig (b)

5. As mentioned in Q4, find the forces in all members of girder by method of section. 20

SECTION – C

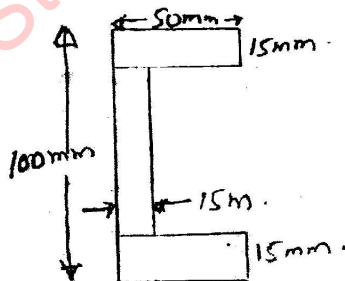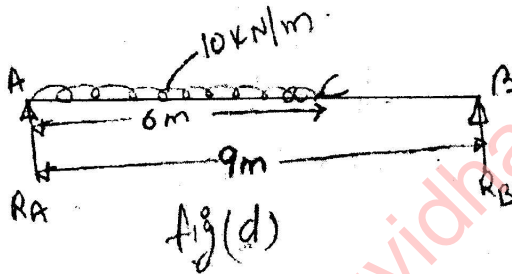6. Find the centre of gravity of a channel section 100 mm × 50 mm × 15 mm. (fig. C) 20

fig (c)

7. Determine the area moment of inertia of a semicircle about its centroidal axis. Let the base of the semicircle be aligned along the X-axis, symmetrical about y-axis.

20

SECTION – D

8. Draw share force and Bending moment diagrams of the beam as shown in fig (d).

20

fig (d)

9. A flywheel with a radius of gyration 0.9m is fitted to a multi cylinder engine, which runs at a mean speed of 360 r.p.m. If the speed varies from 2% above the mean to 2% below it and fluctuation of energy is 30 KN-m, find :

20

(a) Moment of Inertia of wheel,

(b) Mass of flywheel.

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