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Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations November-2020
ENGINEERING MECHANICS
(Common to CE, ME & AGE)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 a The resultant of the two forces, when they act at an angle of 60o is 14 N. If the   **6M**
same forces are acting at right angles, their resultant is √137 N. Determine the
magnitude of the two forces.

   b State and prove parallelogram law of forces.   **6M**

OR

2 A gusset plate of roof truss is subjected to forces as shown in Fig.1. Determine the   **12M**
magnitude of the resultant force and its orientation measured counter clockwise from
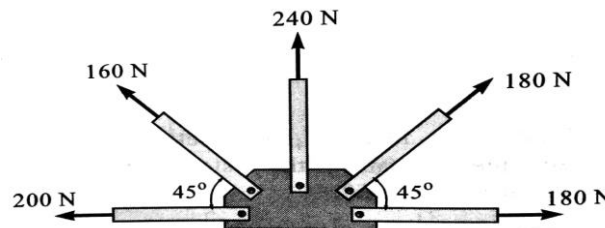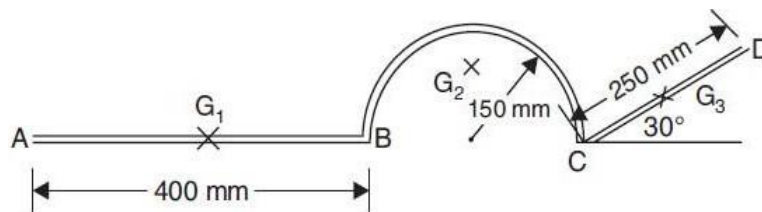the positive x-axis.

Fig.1

UNIT-II

3 Find the least force required to drag a body of weight 'W' placed on a rough inclined   **12M**
plane having inclination 'α' to the horizontal. The force is applied to the body in such
a way that it makes an angle 'Ө' to the inclined plane and the body is on the point of
motion up the plane.

OR

4 a State laws of friction.   **8M**
   b Explain Cone of Friction with a neat sketch.   **4M**

UNIT-III

5   **12M**

Locate the centroid of the uniform wire bent as shown in Fig.2.

Fig.2.

OR

6   An I-section is made up of three rectangles as shown in Fig.3. Find the moment of **12M** inertia of the section about the horizontal axis passing through the centre of gravity of the section.
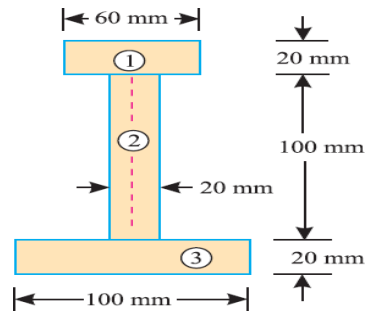

Fig.3

UNIT-IV

7   Derive an equation for moment of inertia of the following sections about centroidal **12M** axis: i) A rectangular section.   ii) A triangular section from its base.

OR

8   Find the moment of inertia about the centroidal X-X and Y-Y axes of the angle section **12M** shown in Fig.4.
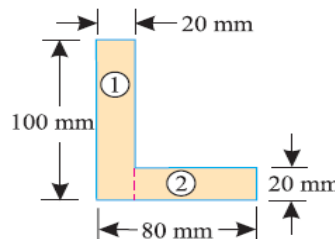

Fig.4.

UNIT-V

9   An inclined truss loaded as shown in Fig. 5. Determine the nature and magnitude of **12M** the forces in the members BC, GC and GF of the truss.

Fig. 5.

OR
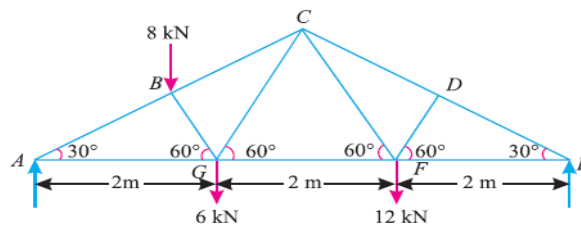
10   Define the following: **12M**
    i) What is a cantilever truss? How will you find out its reactions?
    ii) State the assumptions made in the analysis of pin jointed trusses.
    iii) How method of joint differs from the method of section in the analysis of pin jointed trusses?   iv) What is meant by perfect frame?

*** END ***