Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations December-2021
ENGINEERING MECHANICS
(Common to CE, AGE & ME)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)
UNIT-I
1   a   State and prove parallelogram law of forces.   6M
    b   Classify different system of forces with suitable examples.   6M

OR

2   State and prove Varignon's theorem.   12M

UNIT-II

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

OR

4   A ladder 5 meters long rests on a horizontal ground and leans against a smooth vertical   12M
    wall at an angle 70° with the horizontal. The weight of the ladder is 900 N and acts at its
    middle. The ladder is at the point of sliding, when a man weighing 750N stands on a rung
    1.5 metre from the bottom of the ladder. Calculate the coefficient of friction between the
    ladder and the floor.

UNIT-III

5   A uniform lamina shown in Fig. 12 consists of a rectangle, a circle and a triangle.   12M
    Determine the centre of gravity of the lamina. All dimensions are in mm
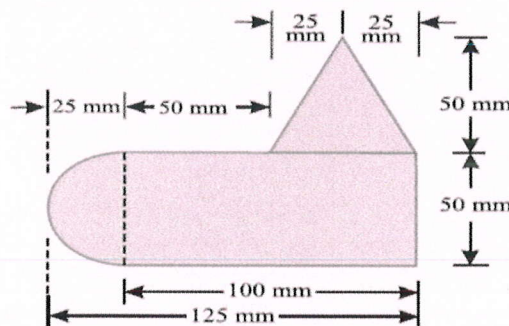

Fig. 12

OR

6   Find the centre of gravity of a channel section 100 mm × 50 mm × 15 mm as shown in   **12M**
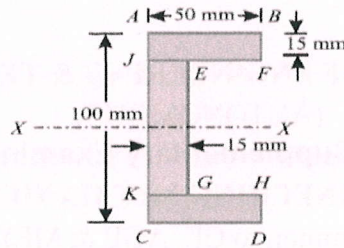

Fig.18

UNIT-IV

7   Prove the parallel axis theorem in the determination of moment of inertia of areas with   **12M**
    the help of a neat sketch.

OR

8   **a** Derive an equation for moment of inertia of a rectangular section about centroidal axis.   **6M**
    b Derive an equation for moment of inertia of a triangular section from its base about   **6M**
        centroidal axis.

UNIT-V

9   Explain the procedure to find forces in members of truss by using method of joints.   **12M**

OR

10   i) What is a cantilever truss? How will you find out its reactions?   **12M**
    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?
    v) What are the types of vibrations?

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