**Reg. No:**

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

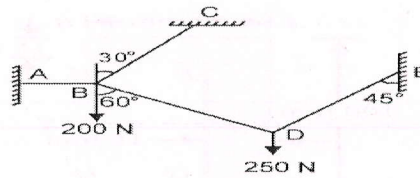Time: 3 hours                                                                 Max. Marks: 60
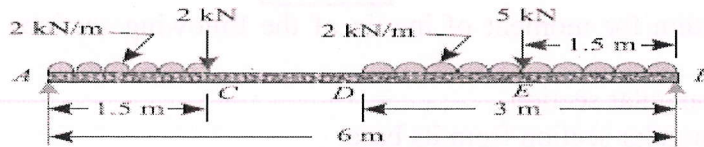
(Answer all Five Units **5 x 12 = 60** Marks)

### UNIT-I

1   A system of connected flexible cable shown in figure is supporting two vertical forces   **12M**
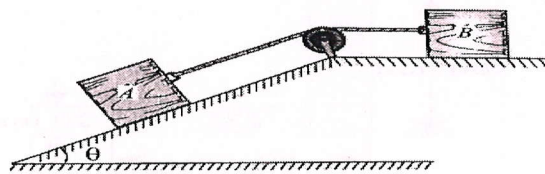    200N and 250N at points B and D. Determine the forces in various segments of the
    cable.

**OR**

2   A simply supported beam AB of span 6m is loaded as shown in figure. Determine the   **12M**
    reactions at A and B.

### UNIT-II

3   **a** State laws of friction.                                                           **6M**
    **b** Find the value of 'Θ', if the block 'A' and 'B' shown in figure have impending   **6M**
    motion. Given block A = 20 kg, block B = 20 kg, $\mu_A = \mu_B = 0.25$.

**OR**

4   A ladder of length 4m, weighing 200N is placed against a vertical wall as shown in   **12M**
    figure. The coefficient of friction between the wall and the ladder is 0.2 and that
    between floor and the ladder is 0.3. The ladder, in addition to its own weight, has to
    support a man weighing 600N at a distance of 3m from A. Calculate the minimum
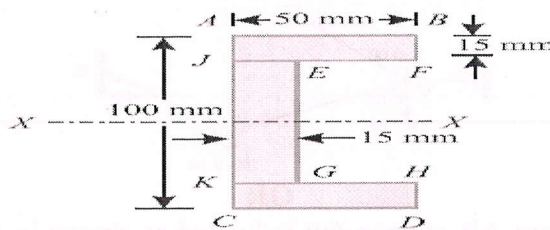    horizontal force to be applied at A to prevent slipping.
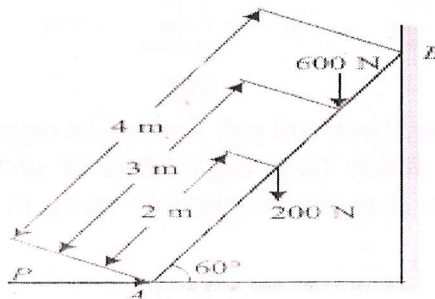
**UNIT-III**

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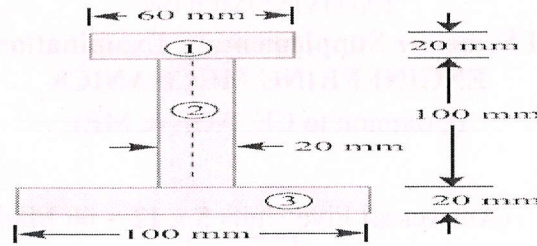


**OR**

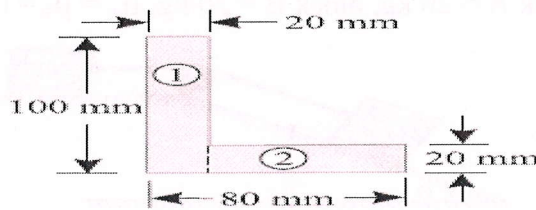6  Find the centre of gravity of a channel section 100mm × 50mm × 15mm as shown in figure.  **12M**



**UNIT-IV**

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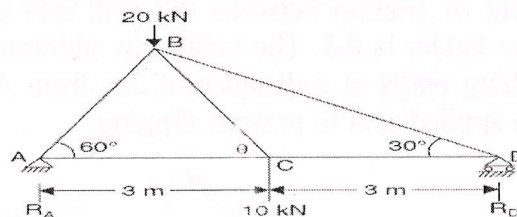   i) A rectangular section
   ii) A triangular section from its base

**OR**

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



**UNIT-V**

9  Determine the forces in all the members of the truss shown in figure.  **12M**



**OR**

10  a  What is a cantilever truss? How will you find out its reactions?  **4M**
    b  How method of joint differs from the method of section in the analysis of pin jointed trusses and also state the assumptions made in the analysis of pin jointed trusses.  **8M**

*** END ***

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