VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

**SLOT: A1+TA1**

**SCHOOL OF MECHANICAL ENGINEERING**

**CONTINUOUS ASSESSMENT TEST – I**

**FALL SEMESTER 2022-2023**

**Programme Name & Branch:** B.Tech. & Mechanical Engineering

**Course Code/Name:** BMEE201L/Engineering Mechanics

**Faculty Name(s):** Dr. P.Suya Prem Anand/ Dr. Sharan Chandran M/ Dr. Bikash Routh

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**Class Number(s):** VL2022230105517 / VL2022230105369 / VL2022230105446

**Exam Duration: 90 minutes** **Maximum Marks: 50**

**General instruction(s):**

| Q.No | Questions | Marks |
|---|---|---|
| 1. | The hook structure is subjected to the forces acting on $F_1$ and $F_2$ as shown in Figure 1. Determine the magnitude of the resultant force and its direction using any method? | 10 |

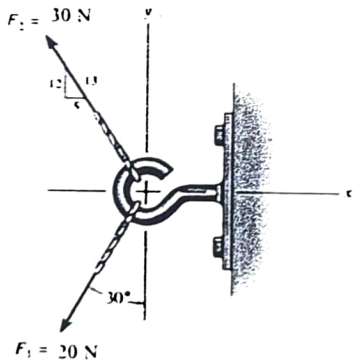


Figure 1

| | | |
|---|---|---|
| 2. | If the 5-kg block is suspended from the pulley B and the sag of the cord is d = 0.15 m, determine the force in cord ABC. Neglect the size of the pulley as shown in Figure 2. | 10 |

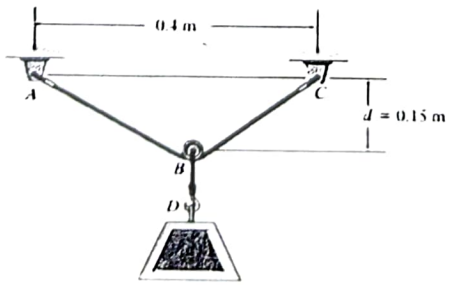


Figure 2

3. If $F_B$ = 700 N, and $F_C$ = 560 N, determine the magnitude and coordinate direction angles of the resultant force acting on the flag pole as shown in Figure 3? 10

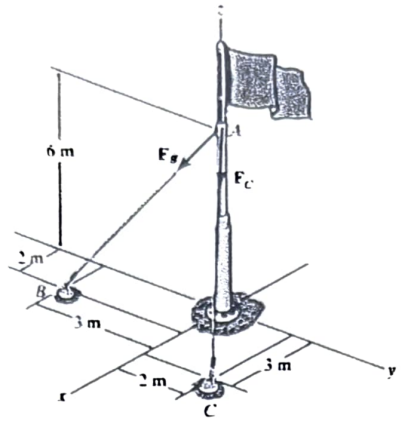


Figure 3

4. Replace the loading system by an equivalent resultant force and couple moment acting at point O as shown in Figure 4. 10

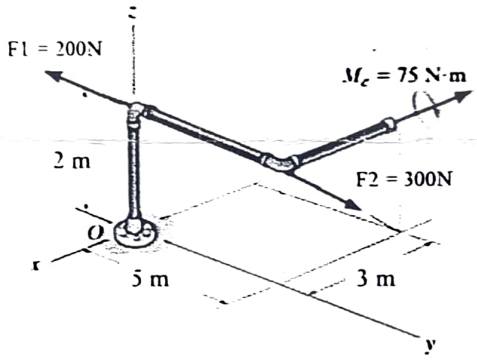


Figure 4

5. Determine the horizontal and vertical components of reaction on the member at the pin A, and the normal reaction at the roller B as shown in Figure 5? 10

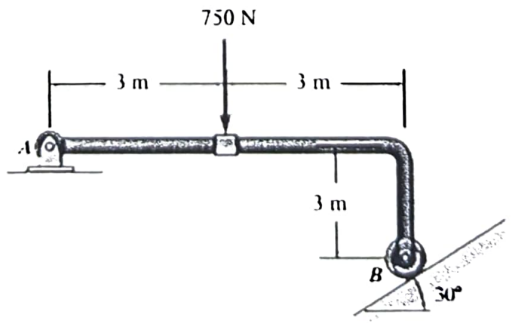


Figure 5