Section C

5. Fig. 5 shows a truss of 15 m span loaded as shown. Find the forces in the members of the truss by the method of joints. **15**

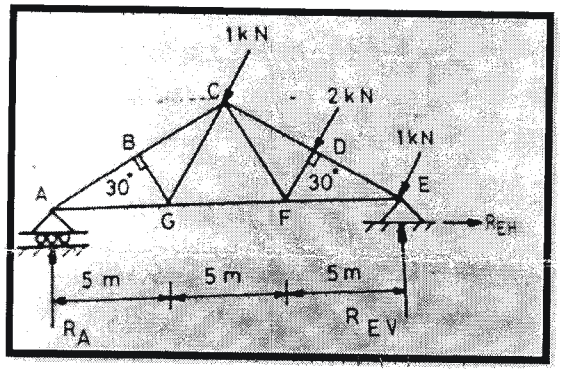

Fig. 5

6. Draw shear force and bending moment diagrams of a simply supported beam when subjected to a UDL over the whole span. **15**

Section D

7. Two ships leave a port at the same time. The first steams North-West at 40 km/hr and the second steams at 40° South of West at 30 km/hr. Determine the velocity of the second relative to the first and after what interval of time they will be 300 Km apart ? **15**

Roll No. ..... **Total Pages : 05**

Sep-21-00671

B. Tech. EXAMINATION, 2021

Semester II (CBCS)

ENGINEERING MECHANICS

ME-101

Time : 2 Hours *Maximum Marks : 60*

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. In the Fig. 1, a sphere is resting in a smooth V shaped groove and subjected to a spring force. The spring is compressed to a length of 100 mm from its free length of 150 mm. If the stiffness of spring

k = 2 N/mm determine the contact reactions at the points L and M. **15**

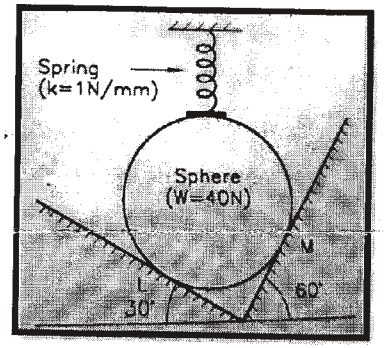

Fig 1

2. A 1.5 m long horizontal bar is hinged at its left side and supported by a cable as shown in Fig. 2. If the bar is to carry a body of weight 150 N at its end, determine the support reactions and tension in the cable. **15**

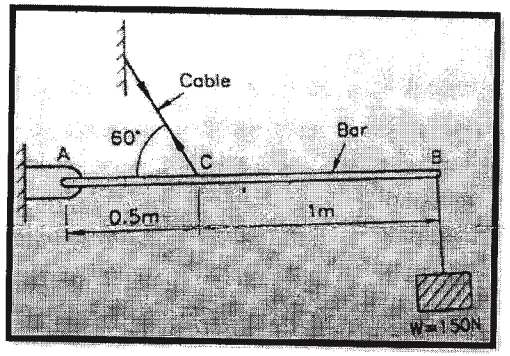

Fig 2

Section B

3. Locate the centroidal coordinates and determine MOI about X axis for section shown in Fig.3. **15**

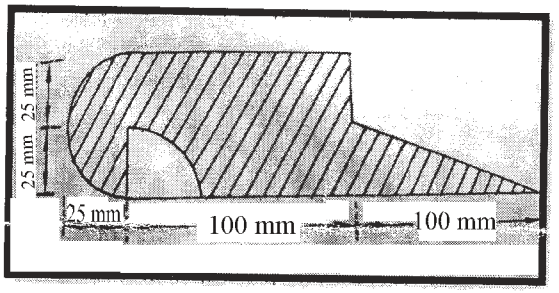

Fig. 3

4. For the system shown in Fig. 4 determine the force F acting downward and parallel to the plane so as to start the motion of B. What will be the tension in the cord ? Assume coefficient of friction 0.40 for all contact surfaces. **15**

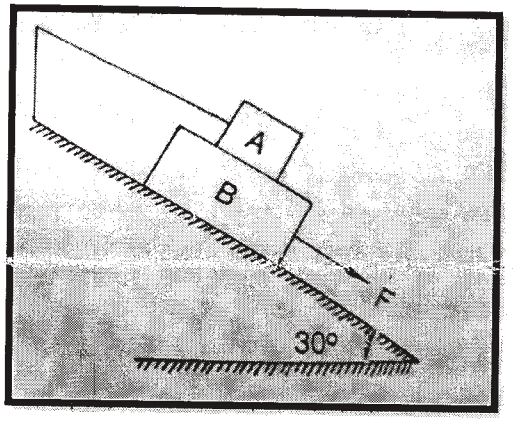

Fig 4

8. After the block in Fig. 6 has moved 10 m from rest, the constant force P is removed. Find the velocity of the block when it returns to its initial position. **15**

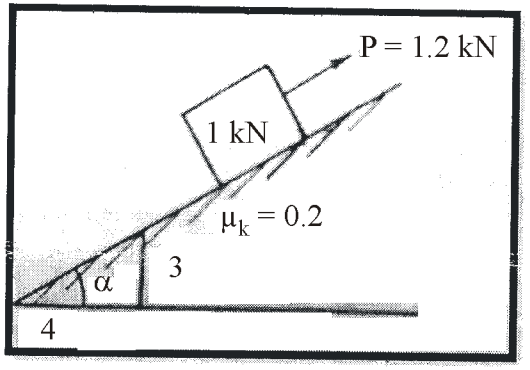

Fig. 6

(Compulsory Question)

9. Explain the following : **5×3=15**

(i) Parallelogram law

(ii) Free body diagram

(iii) Principal moment of inertia

(iv) Types of beams

(v) D'Alembert principle