Total no. of Pages 02

Roll no. 2K21/CE/95

3rd SEMESTER

B.Tech. (Civil Engg.)

MID TERM EXAMINATION

Sept. 2022

CE203 **Engineering Mechanics**

Time: 1:30 Hours

Max. Marks: 20

Note: All questions are compulsory.
Marks of the questions are mentioned opposite to them.
Assume suitable missing data, if any.

Q.1 Find the magnitude and direction of the resultant of forces shown in Fig. 1. [4] [CO2]

Q.2 Analyze the truss shown in Fig. 2 and determine forces in members using method of joints or using Maxwell diagram. [5] [CO3]

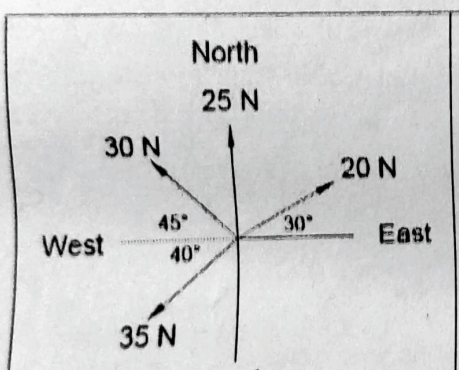

Fig. 1

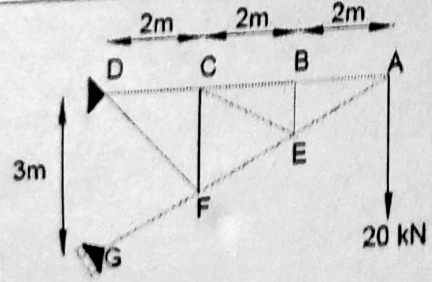

Fig. 2

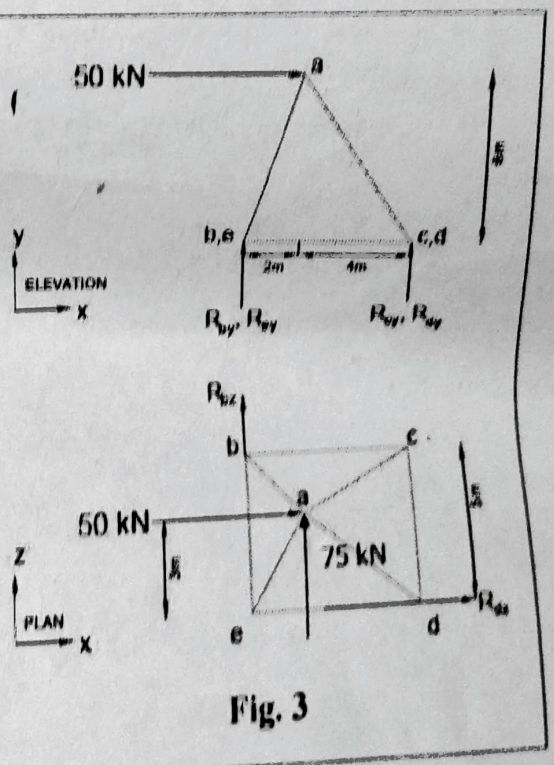

Fig. 3

Q.3 Determine reaction components R_b^y, R_c^y, R_d^y, R_e^y, R_b^z and R_d^x of the space truss shown in Fig. 3. Other reaction components are zero. Plan and elevation of the truss are shown in XZ and XY planes respectively. [Solid arrow lines show the direction of forces and reaction vectors]. [5] [CO1]

Q.4 A 200 kg cylinder is hung by means of two cables AB & AC, which are attached to the top of a vertical wall. A horizontal force P perpendicular to the wall holds the node A in the position as shown in Fig. 4. Determine the magnitude of P and tension in each cable. [6] [CO2]

OR

Q.4 A 1600 N weight is attached at A to the lever as shown in Fig. 5. The stiffness of the spring BC is k = 45 N/mm. The spring is un-stretched, when Θ is zero. Take, length AO as l = 200 mm and the radius of the disc as 75 mm. Determine Θ to define the equilibrium position. [6] [CO1]

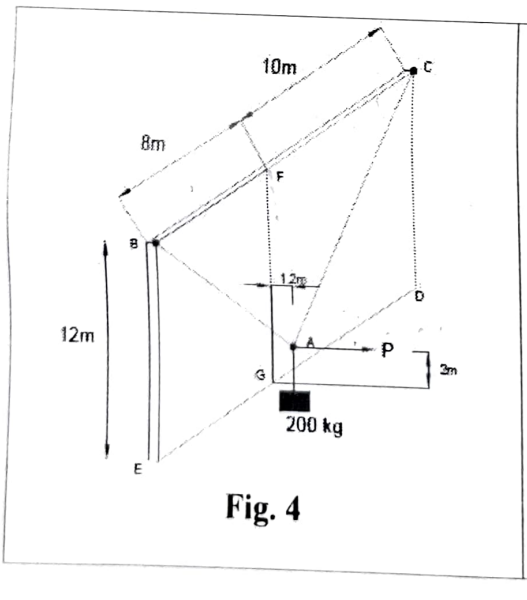

Fig. 4

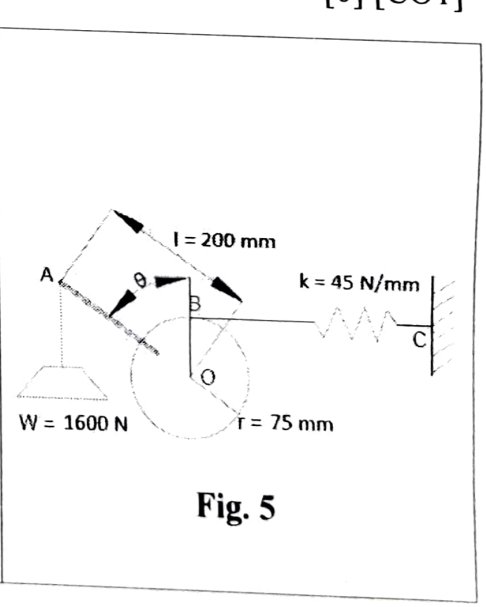

Fig. 5