

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Sixth Semester

Civil Engineering

CE3602 – Structural Analysis II

Regulations - 2021

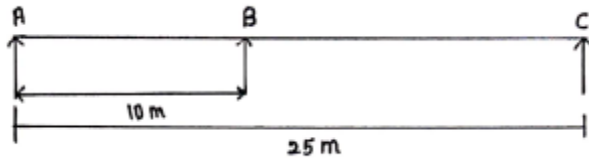
Duration : 3 Hrs

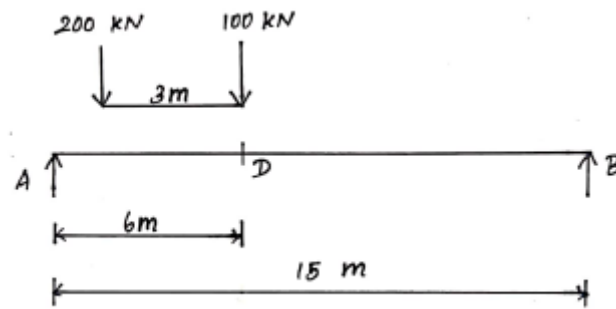
Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

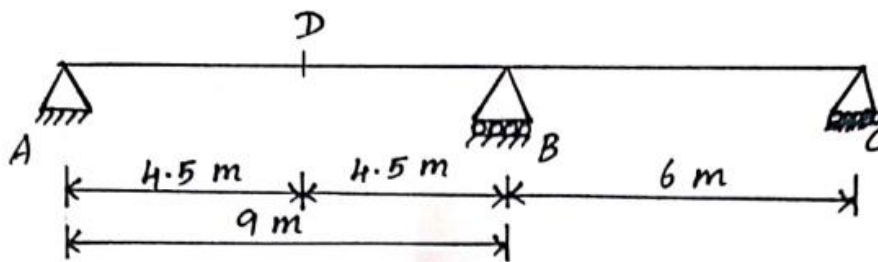
Q.No	Questions	BLT	CO	Marks
1.	State importance of Influence line diagram.	RE	1	2
2.	Construct the ILDs for support reactions in a simply supported beam.	AP	1	2
3.	State Muller Breslau's principle.	RE	2	2
4.	Construct the ILD for bending moment at $L/3$ distance from the left support of a simply supported beam of span length L .	AP	2	2
5.	Distinguish between two hinged and three hinged arches.	AN	3	2
6.	Discuss the types of arches according to their shapes.	AN	3	2
7.	What are the main functions of stiffening girders in suspension bridge?	RE	4	2
8.	Mention the different types of cable structures.	RE	4	2
9.	List the assumptions made in two cycle moment distribution method.	AN	5	2
10.	How to find axial stresses in columns by using cantilever method.	RE	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

Q.No	Questions	BLT	CO	Marks
11.	a Draw the influence line diagram for bending moment at a point 10m distance from the left-hand abutment on a bridge girder of span 25m and find the maximum bending moment at the point due to a series of wheel loads 100 kN, 200 kN, 200 kN, 200 kN and 200 kN at centre to centre distance of 4m, 2.5m, 2.5m and 2.5m. The loads can cross in either direction, 100 kN load leading in each case.  Or b Two point loads of 100 kN and 200 kN spaced 3m apart cross a girder of span 15m from left to right with the 100 kN load leading. Draw the influence line for shear force and bending moment and find the value of maximum shear force and bending moment at a section D, 6m from the left hand support. Also, find the absolute maximum bending moment due to the given load system.	AP	1	13
		AP	1	13

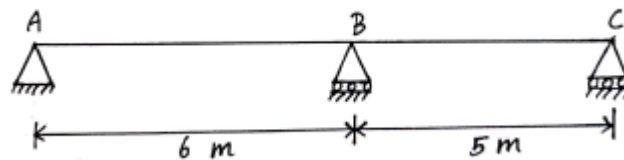


12. a Using Muller Breslau principle, draw the influence line for bending moment at the mid-point D of span AB of the continuous beam ABC shown in fig. Determine the influence line ordinates at suitable intervals and plot them. RE 2 13



Or

- b Find the influence line diagram for reaction at B in the continuous beam shown in fig. Take EI as constant throughout. RE 2 13



13. a A three hinged symmetric parabolic arch of span L and central rise y_c has its hinges at either springing and at the crown. It is subjected to a uniformly varying load varying from zero at the crown to w/m run over either springings. Obtain the maximum bend moment and its location. AP 3 13

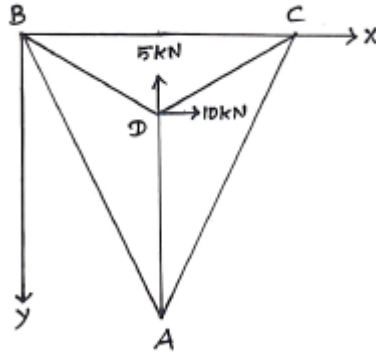
Or

- b A three hinged arch is circular, 25m in span with a central rise of 5m. It is loaded with a concentrated load of 10 kN at 7.5m from the left hand hinge. Find the horizontal thrust, reactions at each end and bending moment under the load. AP 3 13

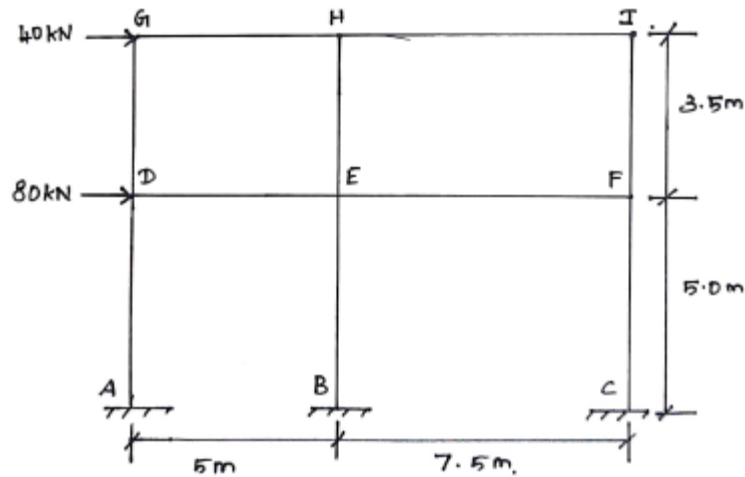
14. a A three-hinged stiffening girder of a suspension bridge of span 100m is subjected to two point loads of 200kN and 300kN at the distance of 25m and 50m from the left end. Find the shear force and bending moment for the girder at a distance of 30m from the left end. The supporting cable has a central dip of 10m. Find also the maximum tension and its slope in the cable. AN 4 13

Or

- b Determine the forces in the members of the space truss shown in fig by the tension coefficient method. The coordinates are A (2,6,0), B (0,0,0), C(6,0,0) and D(2,2,5). A,B,C are hinged supports. AN 4 13

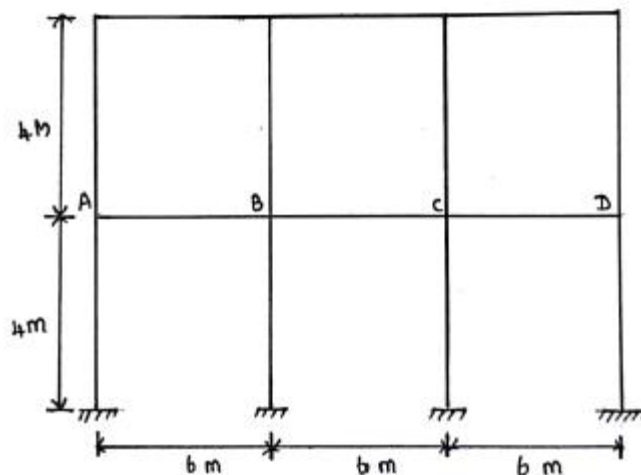


15. a Using the portal method, analyse the building frame subjected to horizontal forces (due to wind) as shown in fig. Sketch the bending moment diagram. UN 5 13



Or

- b A multistoreyed building is shown in below fig. where the frames are spaced at 5m intervals. Dead load from the slab is 3 kN/m^2 and the live load is 4 kN/m^2 . Analyse the beam BC for midspan positive bending moment. Ignore the self-weight of the beams. Use substitute frame method. UN 5 13



*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	A two-hinged parabolic arch of span 50m and rise 5m is subjected to a central concentrated load of 60kN. It has an elastic support which yields by 0.0001 mm/kN. Taking $E=200 \text{ kN/mm}^2$, $I=5 \times 10^9 \text{ mm}^4$, Average area= 10000 mm^2 , $\alpha=10 \times 10^{-6}/^\circ\text{C}$ and assuming secant variation, calculate the horizontal thrust developed when the temperature rises by 20°C (i) neglecting rib shortening, (ii) considering rib shortening.	UN	3	15
		Or			
	b i	Explain the steps involved in the computation of moment and shear in various members of the top most storeys of a three bay frame members using cantilever method.	UN	5	9
	ii	What are the advantages of approximate method of analysis?	UN	5	6