R18 Regulation *Subject code:2P4AD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech IV Semester Supplementary Examinations, June 2026

STRUCTURAL ANALYSIS-I

(CE)

Maximum Marks: 70 Date: 15.06.2026 Duration: 3 hours

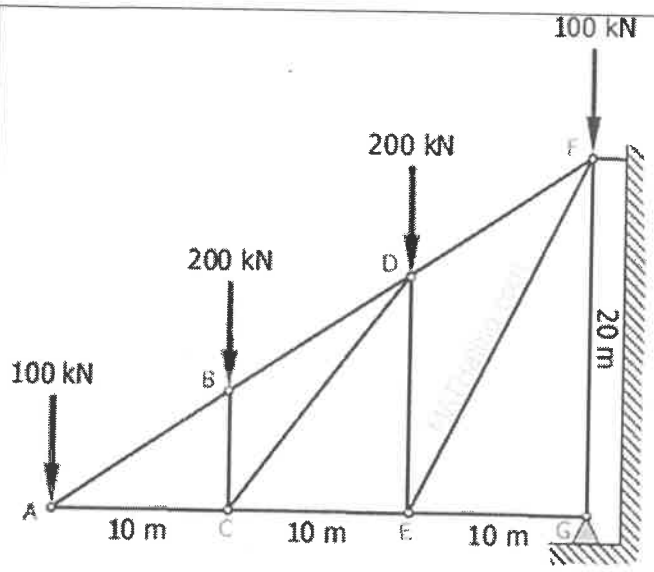
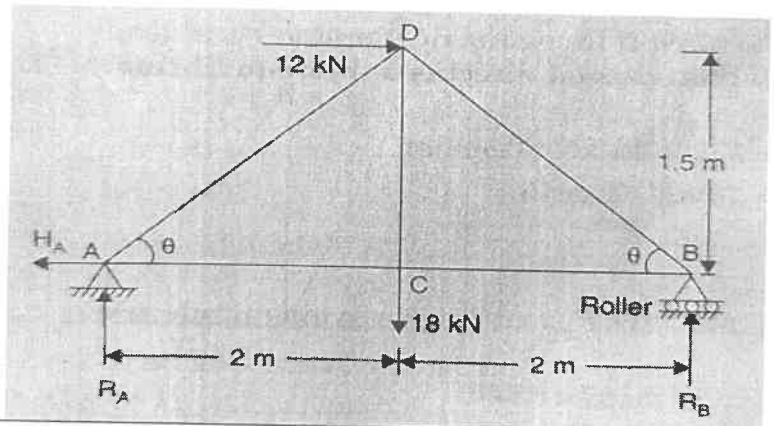
Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

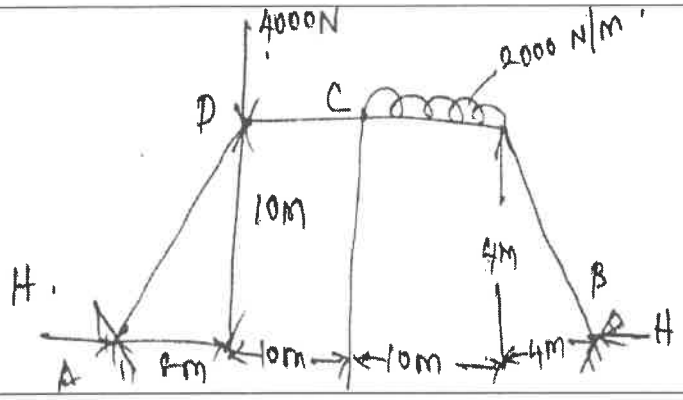
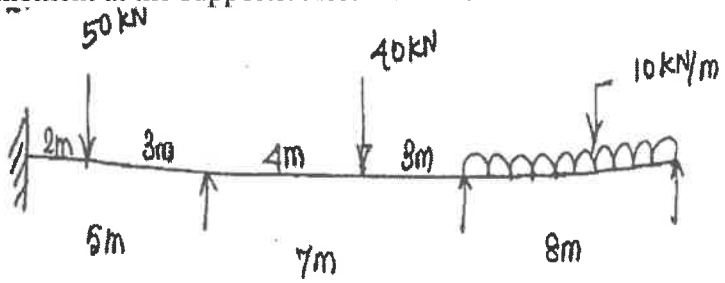
Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	What is the difference between statically determinate and indeterminate structure?	2M	1	L1
2	What are the advantages of fixed beam?	2M	1	L1
3	Differentiate the perfect frame and deficient frame with an example?	2M	2	L1
4	Define redundant force.	2M	2	L1
5	A steel rod has a square cross section of 10mm x 10mm and a length of 2M. Find the strain energy when a stress of 400 Mpa is produced by stretching it.Take E = 200 Gpa.	2M	3	L1
6	Write down the expressions for radial shear and normal thrust in a three hinged parabolic arch?	2M	3	L1
7	Write Continuous beam with neat diagram.	2M	4	L1
8	What is importance of Elastic curves in beams?	2M	4	L1
9	Where do you get rolling loads in practice?	2M	5	L1
10	Define focal length.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Analyze a propped cantilever beam carrying an UDL and draw SFD & BMD.	10M	1	L2
	OR			
12	A fixed beam of length 6m carries point loads of 20Kn and 15kNn at distance 2m and 4m from the left end A. Find the fixed end moments and the reactions at the supports. Draw B.M and S.F diagrams.	10M	1	L2
13	Determine the forces in all the members of the truss shown	10M	2	L2

	 **Figure P-411**			
	OR			
14	Determine the forces in the truss shown in fig. which carries a horizontal load of 12Kn and a vertical load of 18Kn at center. 	10M	2	L2
15	a) Find the deflection of free end of a cantilever carrying load P at the free end. b) A beam of span l carries a concentrated load P at eccentric distance. Find the deflection of eccentric load.	5M 5M	3	L2
	OR			
16	The figure shows a three hinged arch with hinges at a A, B and C. The distributed load of 2000N/m acts on CE and a concentrated load of 4000N at D. Determine the horizontal thrust and plot BMD.	10M	3	L2

				
17	A continuous beam ABCD 20m long carried loads as shown in figure 5. Analyze the beam by using moment distribution method and find the bending moment at the supports. Assume EI constant. 	10M	4	L2
	OR			
18	A beam ABCD, 16m long is continuous over three spans AB=6m, BC = 5m & CD = 5m the supports being at the same level. There is a udl of 15kN/m over BC. On AB, is a point load of 80kN at 2m from A and CD there is a point load of 50 KN at 3m from D, Determine the moments by using moment distribution method. Assume EI const.	10M	4	L2
19	Determine the influence line for RA for the continuous beam ABC. Compute influence line ordinates at 1m intervals. Analyze the continuous beam ABC by slope deflection method and draw BMD. (EI is constant)	10M	5	L2
	OR			
20	Construct the influence line for MB for the continuous beam ABC simply supported at A and C using Muller Breslau`s principle. AB=3m, BC=4m.EI is constant.	10M	5	L2