R18

ANURAG Engineering College
(An Autonomous Institution)
II B.Tech II Semester Supplementary Examinations, June/July-2024
STRUCTURAL ANALYSIS-I
(CIVIL ENGINEERING)

Time: 3 Hours   **Max. Marks: 75**

Section – A (Short Answer type questions)   (25 Marks)
Answer All Questions

|		Course Outcome	B.T Level	Marks
1.	Differentiate between perfect frame and imperfect frame.	CO1	L2	2M
2.	What are the assumptions made in finding out the forces in a frame?	CO1	L1	3M
3.	State Castigliano's second theorem.	CO2	L2	2M
4.	A simply supported beam of length L carries a point load W at the centre. Find the deflection using energy theorem.	CO2	L1	3M
5.	Find the moment at the left hand support, if a fixed beam of span 'L' is sink by an amount 'Δ' at the right hand support.	CO3	L1	2M
6.	A propped cantilever beam of span 5 m is loaded with a UDL of 15 kN/m on the entire span. Find the prop reaction.	CO3	L1	3M
7.	Define the terms: Static Indeterminacy and Kinematic Indeterminacy.	CO4	L1	2M
8.	How clapeyron's theorem of three moments can be applied to the over hanging beams?	CO4	L2	3M
9.	Draw the influence diagram for a shear force at any section of a simply supported beam?	CO5	L2	2M
10.	When several point loads are moving on a beam, what is the condition for maximum bending moment?	CO5	L1	3M

Section B (Essay Questions)
Answer all questions, each question carries equal marks.   (5 X 10M = 50M)

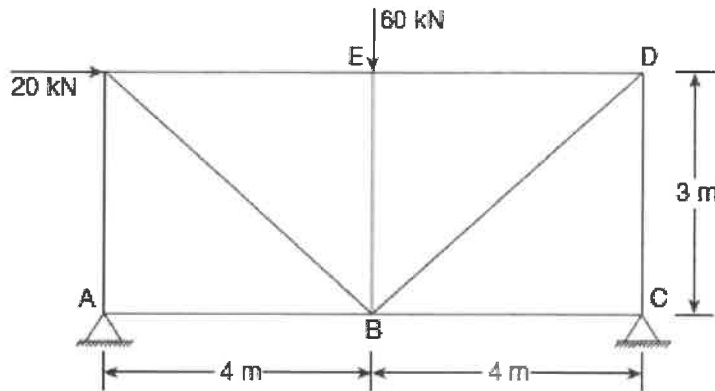|				
11. A)	A truss of 8m span consisting of seven members each 4m length supported at its ends and loaded as shown in Fig. Determine the forces on the members by tension coefficient method.	CO1	L3	10M
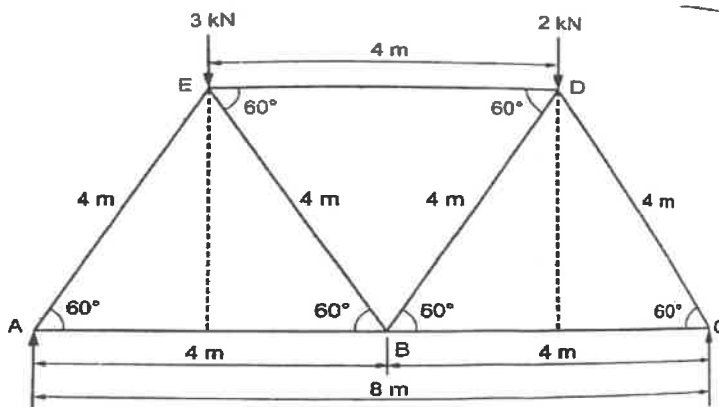
OR

B) Find the force in all members of the truss shown in Fig. by method of joints.　　　　CO1　　L3　　10M

12. A) Analyze a continuous beam simply supported at A,B and C .The span AB is 6m and BC is 8m. The span AB is carrying an udl of 30kN/m and span BC carries a load of 40kN at a distance of 3m from B. Use Strain energy method. Draw the B.M.D.　　CO2　　L3　　10M

OR

B) Asymmetrical parabolic arch hinged at springing and crown has a span of 30m. The central rise of the arch is 4m. It is loaded with UDL of 2.5 KN/m on the left 8m length. Calculate:
i) The direction and the magnitude of reaction at the hinges.
ii) The bending moment, normal thrust and shears at 4m from left end.　　CO2　　L3　　10M

13. A) A cantilever of 6m length carries an U.D.L of 12 kN/m over the full span. If the free end is supported by a prop, find the reaction at the prop and also draw the S.F.and B.M. diagrams.　　CO3　　L3　　10M

OR

B) Derive the equation for a fixed beam with ends at different levels.　　CO3　　L3　　10M

14. A) ABC is a continuous beam with constant EI throughout its length. The end supports A and C are fixed and beam is continuous over middle support B. Span BC is uniformly loaded with 8kN per metre length ,while a concentrated vertical load of 80kN acts at the mid span AB.Calculate the moments by slope deflection method.　　CO4　　L3　　10M

OR

B) A continuous beam ABC is simply supported at A and C and continuous over support B with AB = 7m and BC = 6m.
A uniformly distributed load of 14kN/m is acting over the beam. The moment of inertia is I throughout the span. Analyse the continuous beam and draw S.F.D and B.M.D.　　CO4　　L3　　10M

15. A) Draw the influence line diagrams for forces in the members of a Warren Truss.　　CO5　　L3　　10M

OR

B) i) Draw the influence line diagram for a bending moment at any section of a simply supported beam.　　CO5　　L3　　10M

ii) Draw the influence line diagram for a shear force at any section of a simply supported beam.