Roll No												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

END TERM EXAMINATION AUG-2024

Semester: END TERM
Course Code: CIV2013
Course Name: Analysis of Determinate Structures
Program & Sem: B.Tech (IV Sem)

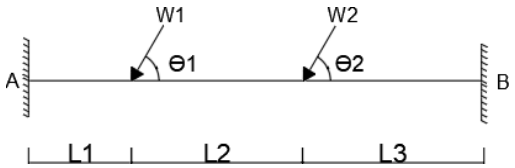
Date: 07-08-2024
Time: 9:30 AM – 12:30 PM
Max Marks: 100
Weightage: 50%

Instructions:
(i) Read all the questions carefully and answer accordingly.
(ii) Scientific and non-programmable calculator are permitted.
(iii) Do not write any information on the question paper other than Roll Number.

Part A [Memory Recall Questions]

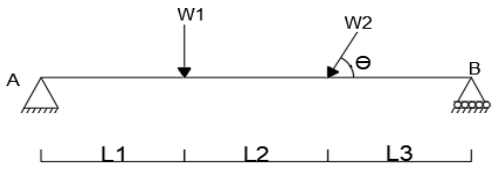
Answer any ten Questions. Each Question carries 2 marks. (10Q x 2M = 20M)

1. Calculate the degree of indeterminacy of a fixed beam loaded as shown in figure below.



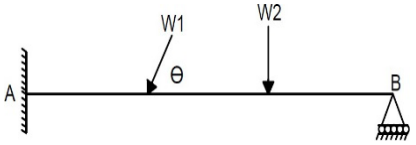
(CO1) [Knowledge]

2. Calculate the degree of indeterminacy of simply supported beam loaded as shown in figure below.



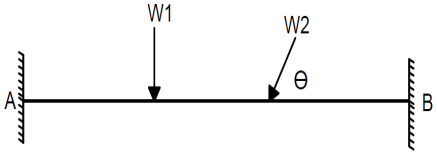
(CO1) [Knowledge]

3. Calculate the degree of indeterminacy of the propped cantilever beam loaded as shown.



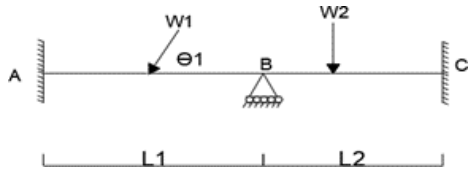
(CO1) [Knowledge]

4. Calculate the degree of indeterminacy of a Fixed beam loaded as shown in the figure below.



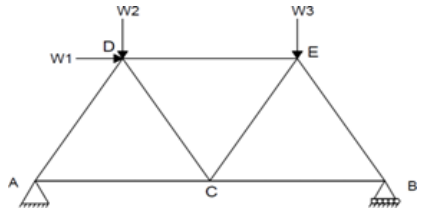
(CO1) [Knowledge]

5. Calculate degree of indeterminacy of a continuous beam loaded as shown in the figure.



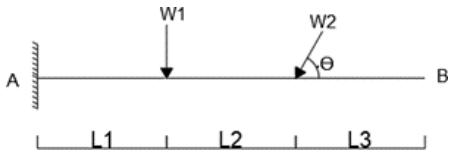
(CO1) [Knowledge]

6. Calculate total degree of indeterminacy of a simply supported truss loaded as shown in figure below.



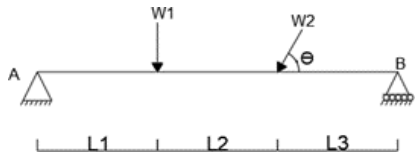
(CO1) [Knowledge]

7. Calculate the degree of indeterminacy of a cantilever beam loaded as shown in the figure.



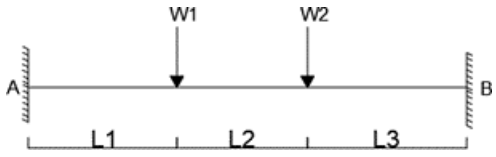
(CO1) [Knowledge]

8. Calculate the degree of indeterminacy of a simply supported beam loaded as shown in the figure below.



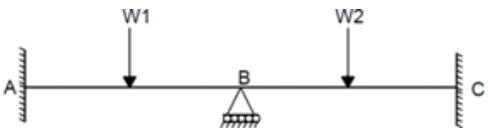
(CO1) [Knowledge]

9. Calculate total degree of indeterminacy of a fixed beam loaded as shown in figure below.



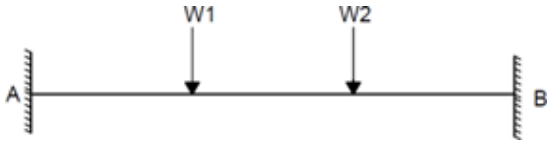
(CO1) [Knowledge]

10. Calculate the total degree of indeterminacy of the continuous beam loaded as shown.



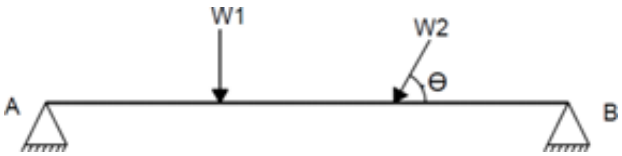
(CO1) [Knowledge]

11. Calculate the total degree of indeterminacy of a fixed beam loaded as shown.



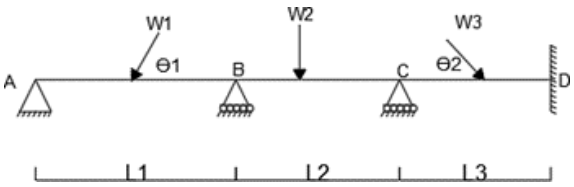
(CO1) [Knowledge]

12. Calculate the degree of indeterminacy of a simply supported beam loaded as shown.



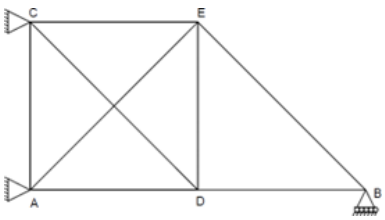
(CO1) [Knowledge]

13. Calculate the degree of indeterminacy of a continuous beam as shown.



(CO1) [Knowledge]

14. Calculate the total degree of indeterminacy of a truss as shown.



(CO1) [Knowledge]

Part B [Thought Provoking Questions]

Answer any four Questions. Each Question carries 8 marks. (4Q x 8M = 32M)

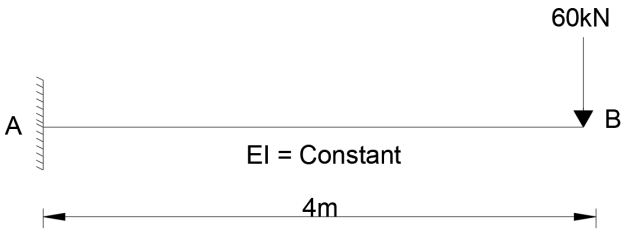
15. The three hinged symmetrical parabolic arch of span 50m and rise of 10m and subjected to UDL of magnitude 20 kN/m on left half of the span. Calculate the support reactions and draw the BMD.

(CO2) [Comprehension]

16. The suspension cable of span 50m, dip of the cable is 10m, subjects to uniformly distributed load of magnitude 10 kN/M throughout the length and it is supported at A & B. The supports are the same level. Calculate the maximum tensile force induces in the cable and also find the cross-sectional area required for the cable, if maximum permissible tensile stress in the cable material is not to exceed 1200 MPa.

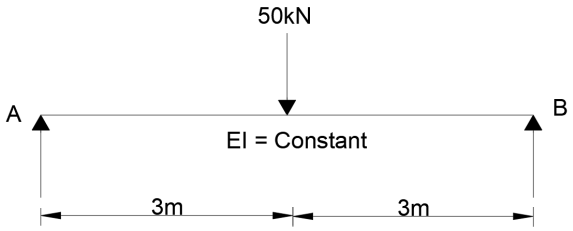
(CO2) [Comprehension]

17. Calculate the maximum slope and deflection for cantilever beam loaded as shown in the figure by moment area method. Take EI = $10X10^4$ kNm².



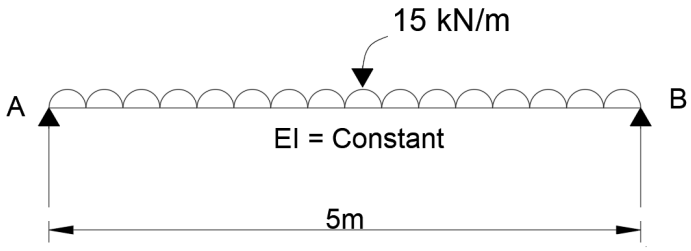
(CO3) [Comprehension]

18. Calculate maximum slope and deflection for simply supported beam loaded as shown in the figure by conjugate beam method. Take EI = $10X10^4$ kNm².



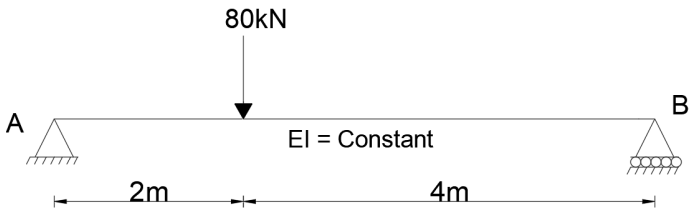
(CO3) [Comprehension]

19. Calculate the maximum slope and deflection for simply supported beam loaded as shown in figure by moment area method. Take EI = $8X10^4$ kNm².



CO3) [Comprehension]

20. Calculate the maximum slope and deflection for simply supported beam loaded as shown in the fig by conjugate beam method. Take EI = $10X10^4$ kNm².



(CO3) [Comprehension]

Part C [Problem Solving Questions]

Answer any four Questions. Each Question carries 12 marks. (4Q x 12M = 48M)

21. The three hinged symmetrical parabolic arch of span 40m, rise of 10m and subjected to point load of magnitude 300 kN at distance 10m from the left support. Calculate the support reactions and draw the BMD also calculate the normal thrust and radial shear at a distance 15m from the left support.

(CO2) [Application]

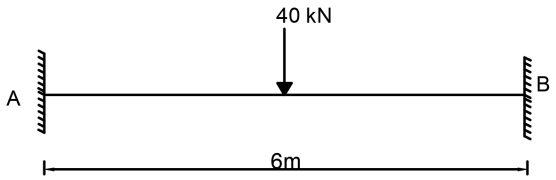
22. The suspension cable of span 50m, dip of the cable id 10 m, subjected to uniformly distributed load of magnitude 15kN/m throughout the length and it is supported at A & B. The supports are the same level. Calculate the maximum tensile force induced in the cable. Also calculate the vertical force and maximum bending on pier. Take back stay is 60^0 with respect to vertical and height of the pier is 10m for the following supporting devices.

    a) Friction less pulley

    b) Saddle or Roller support

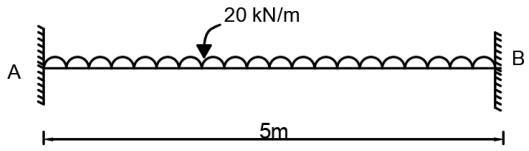
(CO2) [Application]

23. Analyze a fixed beam loaded as shown in the figure by the consistent deformation method and draw the BMD and SFD. Take EI = Constant.



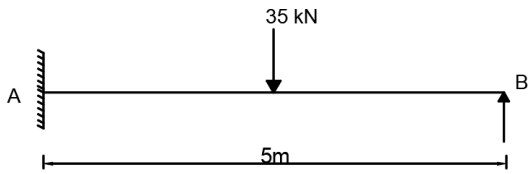
(CO4) [Application]

24. Analyze the fixed beam loaded as shown in the figure by consistent deformation method and draw BMD and SFD. Take EI = Constant.



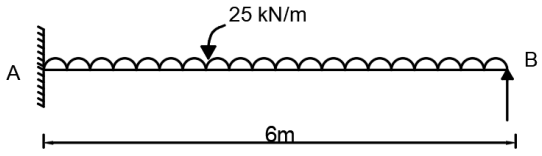
(CO4) [Application]

25. Analyze the propped cantilever beam loaded as shown in the figure by consistent deformation method and draw the BMD and SFD. Take the value EI = Constant.



(CO4) [Application]

26. Analyze the propped cantilever beam loaded as shown in the figure by consistent deformation method and draw the BMD and SFD. Take EI = Constant.



(CO4) [Application]