Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2024

Semester : Semester IV - B.Tech CIV - 2022
Course Code : CIV2013
Course Name : Sem IV - CIV2013 - Analysis of Determinate Structures
Program : B.Tech. Civil Engineering

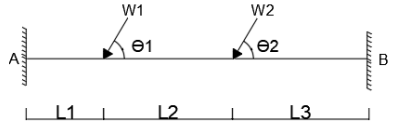
Date : Jun 12, 2024
Time : 7:30 AM - 10:30 AM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

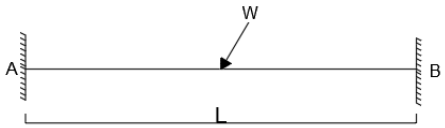
Answer any 10 **10*2=20**

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



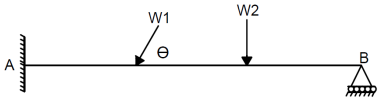
(CO1) [Knowledge]

2. Calculate the total degree of indeterminacy of fixed beam loaded as shown in figure below.



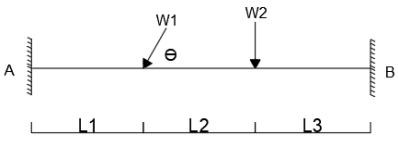
(CO1) [Knowledge]

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



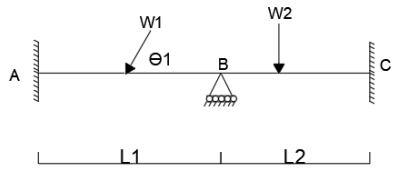
(CO1) [Knowledge]

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



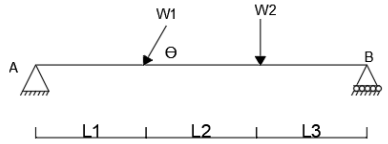
(CO1) [Knowledge]

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



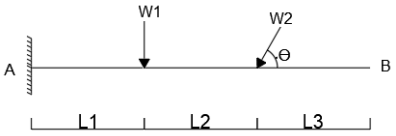
(CO1) [Knowledge]

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



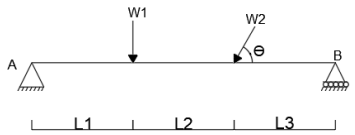
(CO1) [Knowledge]

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



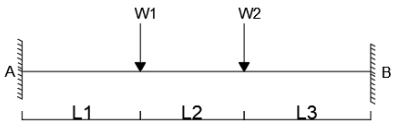
(CO1) [Knowledge]

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



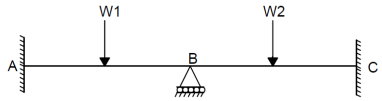
(CO1) [Knowledge]

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



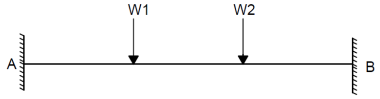
(CO1) [Knowledge]

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



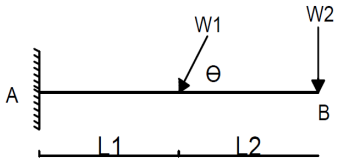
(CO1) [Knowledge]

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



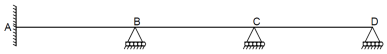
(CO1) [Knowledge]

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



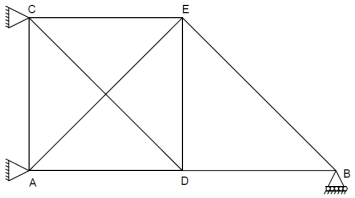
(CO1) [Knowledge]

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



(CO1) [Knowledge]

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



(CO1) [Knowledge]

PART B

Answer any 4 **4*8=32**

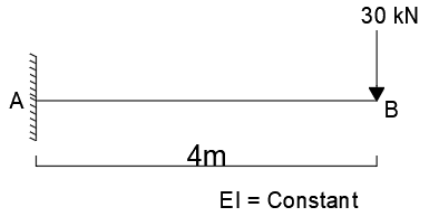
15. The three hinged symmetrical parabolic arch of span 40m and rise of 10m and subjected to UDL of magnitude 25 kN/m on left half of the span. Calculate the support reactions and draw the BMD.

(CO2) [Comprehension]

16. The three hinged symmetrical parabolic arch of span 50m, rise of 10m and subjected to UDL of magnitude 30 kN/m on left half of the arch. Calculate the support reactions and draw the BMD.

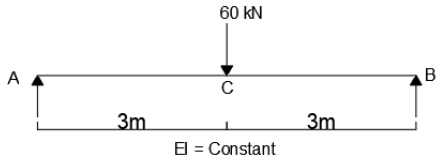
(CO2) [Comprehension]

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



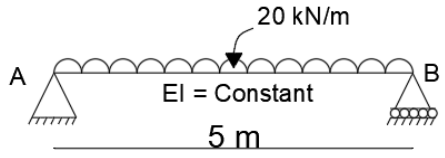
(CO3) [Comprehension]

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



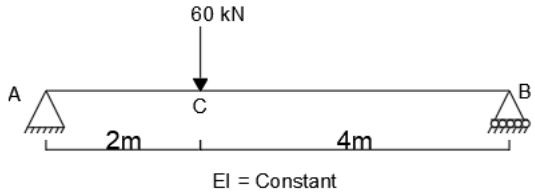
(CO3) [Comprehension]

19. Calculate the maximum slope and deflection for simply supported beam loaded as shown in figure by moment area method. Take EI = $8X_{10^4}$ 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 = 10X 10^4 kNm².



(CO3) [Comprehension]

PART C

Answer any 4 **4*12=48**

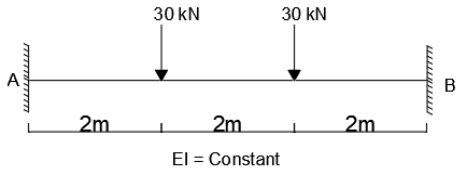
21. The three hinged symmetrical parabolic arch of span 50m, rise of 10m and subjected to point load of magnitude 400 kN at distance 12.5 m from the left support. Calculate the support reactions and draw the BMD also calculate the normal thrust and radial shear at a distance 15 m from the left support.

(CO2) [Application]

22. 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. Also calculate normal thrust and radial shear at distance 12.5m from the left support.

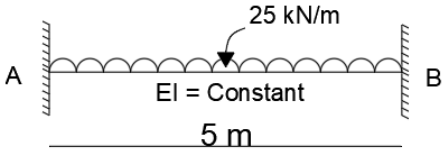
(CO2) [Application]

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.



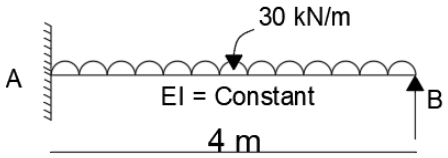
(CO4) [Application]

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



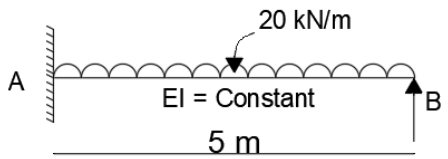
(CO4) [Application]

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]