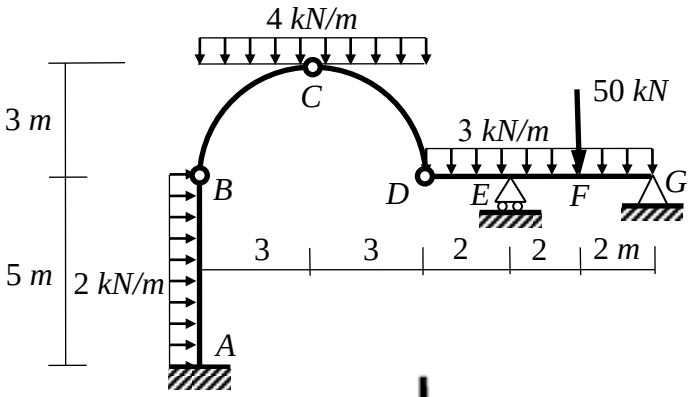
Ministry of Higher Education
Giza Higher Institute of Engineering & Technology
Civil Engineering Department
Course Name: **Theory of Structures (1)**
Course Code: **CIV 111** Date: **12 / 1 / 2023**

Academic Year: **2022/2023**
Semester: **First**
Level: **1st Civil**
Time: **3 Hours**
Examiner: ***Dr. M. Abdel-Kader***

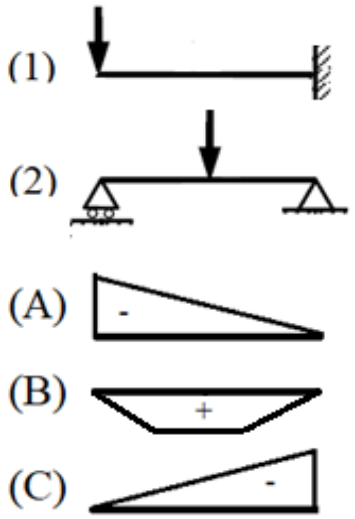
Final Exam

Total Marks: **50** No. of Questions: **50** (Attempt all questions)

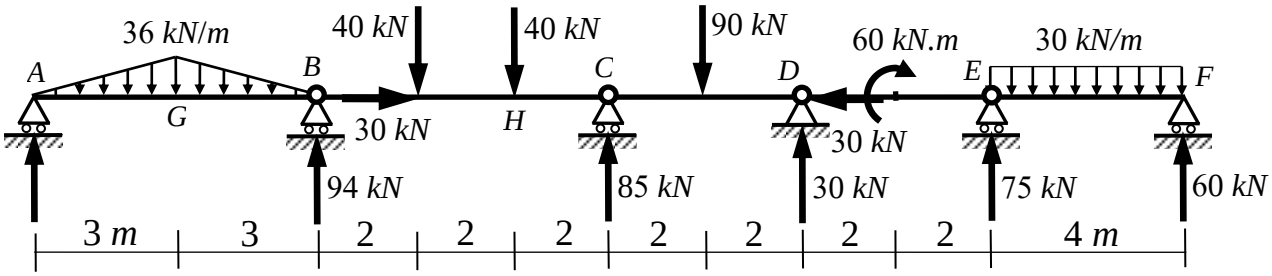
Choose the nearest answer.



1. The vertical reaction at the intermediate hinge ***B*** is:
   (A) 12 *kN* (B) 4 *kN* (C) 24 *kN* (D) 6 *kN*
2. The horizontal reaction at the intermediate hinge ***B*** is:
   (A) 12 *kN* (B) 4 *kN* (C) 24 *kN* (D) 6 *kN*
3. The vertical reaction at the intermediate hinge ***C*** is:
   (A) 12 *kN* (B) 4 *kN* (C) zero (D) 6 *kN*
4. The horizontal reaction at the intermediate hinge ***C*** is:
   (A) 12 *kN* (B) 4 *kN* (C) 24 *kN* (D) 6 *kN*
5. The horizontal reaction at the fixed support ***A*** is:
   (A) 4 *kN* ← (B) 6 *kN* → (C) 10 *kN* ← (D) 6 *kN* ←
6. The vertical reaction at the fixed support ***A*** is:
   (A) 22 *kN* ↑ (B) 24 *kN* ↑ (C) 12 *kN* ↑ (D) 10 *kN* ↑
7. The moment reaction at the fixed support ***A*** is:
   (A) 5 *kN.m* ↻ (B) 30 *kN.m* ↺ (C) 25 *kN.m* ↺ (D) 55 *kN.m* ↻
8. The vertical reaction at the roller support ***E*** is:
   (A) 68 *kN* ↑ (B) 56.5 *kN* ↑ (C) 25 *kN* ↑ (D) 32.5 *kN* ↑
9. The horizontal reaction at the hinged support ***G*** is:
   (A) 4 *kN* → (B) 6 *kN* ← (C) 4 *kN* ← (D) 16 *kN* →
10. The vertical reaction at the hinged support ***G*** is:
    (A) 65.5 *kN* ↑ (B) 23.5 *kN* ↑ (C) 55 *kN* ↑ (D) 47.5 *kN* ↑



11. For the shown cantilever beam in (1), the B.M.D is:
    (A) A (B) B (C) C (D) None
12. For the shown simple beam in (2), the B.M.D is:
    (A) A (B) B (C) C (D) None



13. For the shown beam, the vertical reaction at the support ***A*** is:
    (A) 45 *kN* (B) 54 *kN* (C) 108 *kN* (D) 72 *kN*
14. For the shown beam, the normal force at ***C*** is:
    (A) -30 *kN* (B) -85 *kN* (C) 30 *kN* (D) -40 *kN*
15. The shear force at ***A*** is:
    (A) zero (B) 54 *kN* (C) 36 *kN* (D) 18 *kN*
16. The shear force just at the right of ***B*** is:
    (A) 148 *kN* (B) 40 *kN* (C) 94 *kN* (D) 54 *kN*
17. The shear force just at the right of ***D*** is:
    (A) -30 *kN* (B) 30 *kN* (C) 60 *kN* (D) -15 *kN*
18. The bending moment at ***G*** is:
    (A) 81 *kN.m* (B) 324 *kN.m* (C) 162 *kN.m* (D) 108 *kN.m*
19. The bending moment at ***H*** is:
    (A) 60 *kN.m* (B) 376 *kN.m* (C) 40 *kN.m* (D) 80 *kN.m*
20. The maximum positive bending moment in the beam is at a distance of ….. from the support ***A***:
    (A) 8 *m* (B) 14 *m* (C) 3 *m* (D) 22 *m*
21. The maximum positive bending moment in the beam is:
    (A) 162 *kN.m* (B) 90 *kN.m* (C) 108 *kN.m* (D) 324 *kN.m*

Please turn over

22. For the shown circular arch, the normal force at ***A*** is:
(A) 4 *kN* (B) -36 *kN* (C) -26 *kN* (D) 10 *kN*

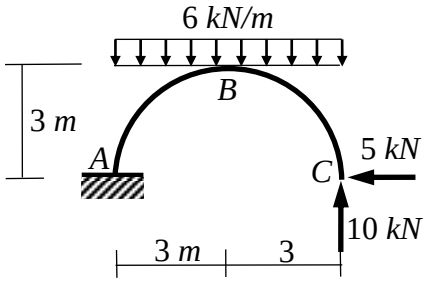
23. The shear force at ***A*** is:
(A) zero (B) 36 *kN* (C) -5 *kN* (D) 10 *kN*

24. The bending moment at ***A*** is:
(A) -48 *kN.m* (B) -108 *kN.m* (C) -60 *kN.m* (D) -168 *kN.m*

25. The normal force at ***B*** is:
(A) -10 *kN* (B) -8 *kN* (C) 10 *kN* (D) -5 *kN*

26. The shear force at ***B*** is:
(A) -10 *kN* (B) 18 *kN* (C) -5 *kN* (D) 8 *kN*

27. The bending moment at ***B*** is:
(A) 30 *kN.m* (B) -12 *kN.m* (C) -15 *kN.m* (D) 15 *kN.m*



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28. For the shown frame, the value of the force in the link member ***BD*** is:
(A) 73.6 *kN* (B) 54 *kN* (C) 104 *kN* (D) 79.2 *kN*

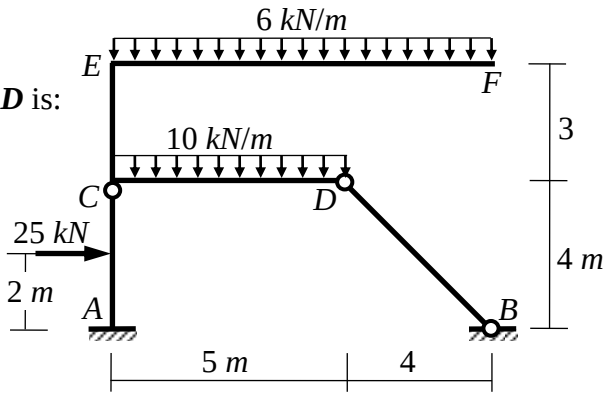
29. The horizontal reaction at the hinged support ***B*** is:
(A) 79.2 *kN* ← (B) 73.6 *kN* ← (C) 25 *kN* → (D) 25 *kN* ←

30. The vertical reaction at the hinged support ***B*** is:
(A) 79.2 *kN* ↓ (B) 79.2 *kN* ↑ (C) 104 *kN* ↑ (D) 73.6 *kN* ↑

31. The horizontal reaction at the fixed support ***A*** is:
(A) 79.2 *kN* → (B) 48.6 *kN* → (C) 25 *kN* → (D) 73.6 *kN* ←

32. The vertical reaction at the fixed support ***A*** is:
(A) 94 *kN* ↑ (B) 54 *kN* ↑ (C) 30.4 *kN* ↑ (D) 79.2 *kN* ↑

33. The moment reaction at the fixed support ***A*** is:
(A) 244 *kN.m* ↻ (B) 424 *kN.m* ↻ (C) 50 *kN.m* ↻ (D) 175 *kN.m* ↻



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34. The normal force in the left column at *B* is:
(A) -540 *kN* (B) -140 *kN* (C) -180 *kN* (D) -130 *kN*

35. The normal force in the right column above ***G*** is:
(A) -490 *kN* (B) -80 *kN* (C) -410 *kN* (D) 80 *kN*

36. The normal force in the beam at ***D*** is:
(A) 180 *kN* (B) -140 *kN* (C) 40 *kN* (D) 130 *kN*

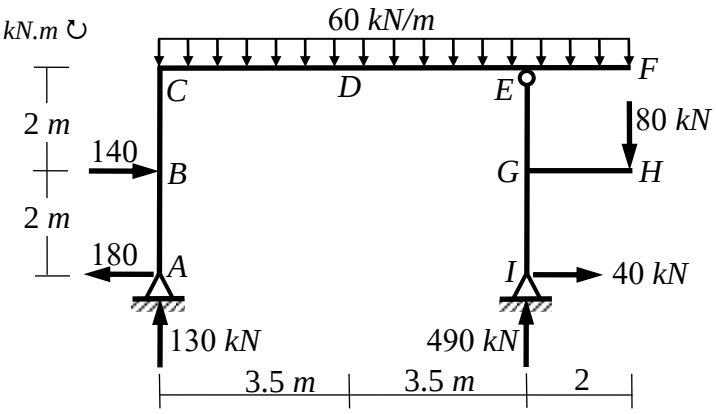
37. The shear force in the left column at ***A*** is:
(A) 180 *kN* (B) 130 *kN* (C) zero (D) 140 *kN*

38. The shear force in the beam at ***D*** is:
(A) 130 *kN* (B) -80 *kN* (C) 40 *kN* (D) -40 *kN*

39. The bending moment in the right column just above ***G*** is:
(A) 240 *kN.m* (B) 490 *kN.m* (C) 180 *kN.m* (D) -80 *kN.m*

40. The maximum positive bending moment in the left column is:
(A) 280 *kN.m* (B) 520 *kN.m* (C) 720 *kN.m* (D) 440 *kN.m*

41. The maximum positive bending moment in the beam is:
(A) 581 *kN.m* (B) 528 *kN.m* (C) 440 *kN.m* (D) 608 *kN.m*



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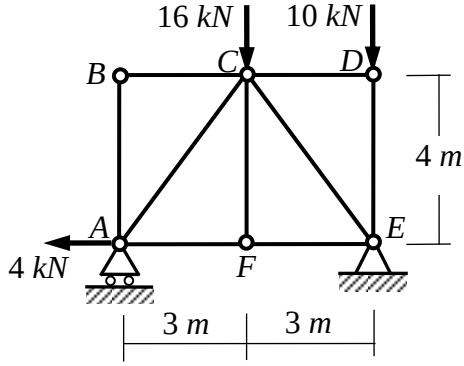
42. For the shown truss, the vertical reaction at the hinged support ***E*** is:
(A) 10 *kN* ↑ (B) 18 *kN* ↑ (C) 16 *kN* ↑ (D) 14 *kN* ↑

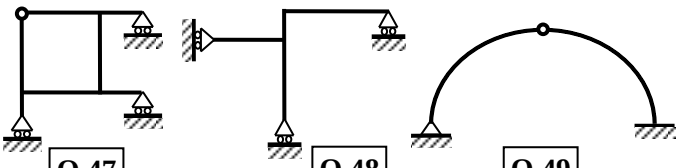
43. The force in the member *AB* is:
(A) zero (B) 8 *kN* T (C) 8 *kN* C (D) 16 *kN* C

44. The force in the member *CD* is:
(A) zero (B) 10 *kN* T (C) 10 *kN* C (D) 26 *kN* C

45. The force in the member *AF* is:
(A) zero (B) 8 *kN* T (C) 10 *kN* T (D) 4 *kN* T

46. The force in the member *CE* is:
(A) 16 *kN* C (B) 10 *kN* T (C) 14 *kN* C (D) 10 *kN* C



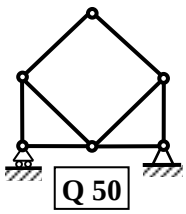


47. The shown structure in Q 47 is:
(A) Unstable (B) Stat. Det. (C) Stat. Ind. to the 1st degree (D) Stat. Ind. to the 2nd degree

48. The shown structure in Q 48 is:
(A) Unstable (B) Stat. Det. (C) Stat. Ind. to the 1st degree (D) Stat. Ind. to the 2nd degree

49. The shown structure in Q 49 is:
(A) Unstable (B) Stat. Det. (C) Stat. Ind. to the 1st degree (D) Stat. Ind. to the 2nd degree

50. The shown structure in Q 50 is:
(A) Unstable (B) Stat. Det. (C) Stat. Ind. to the 1st degree (D) Stat. Ind. to the 2nd degree



With my best wishes
Dr. M. Abdel-Kader