| | **Ministry of Higher Education** | Academic Year: | **2020/2021** |
| | **Giza Higher Institute of Engineering & Technology** | Semester: | **First** |
| | **Civil Engineering Department** | Level: | **1st Civil** |
| | Course Name: **Theory of Structures (1)A** | Time: | **3 Hours** |
| | Course Code: **CIV 111**       Date: **7 / 3 / 2021** | Examiner: | *Dr. M. Abdel-Kader* |

**GEI**
معهد الجيزة للهندسة
GIZA ENGINEERING INSTITUTE

**Final Exam**

Total Marks: **90**                    No. of Questions: **45** (Attempt all questions)
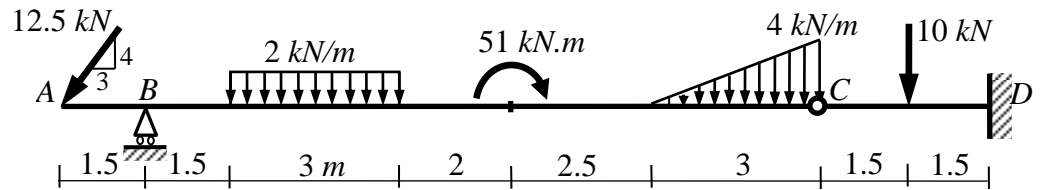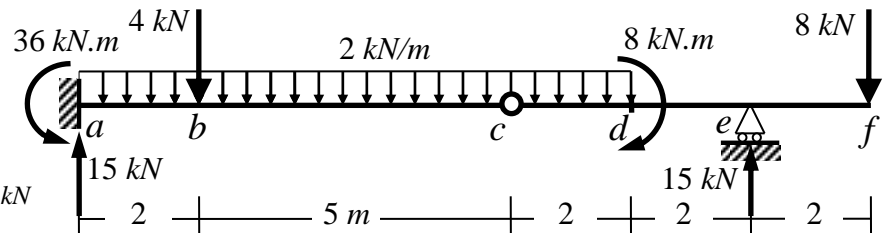
**Choose the nearest answer.**

**(a1, a5, b1, b5, d6)**



1. The shown beam is:
   (A) Statically Indeterminate.  (B) Unstable.    (C) Statically Determinate.  (D) Simple beam.
2. The horizontal component of the inclined force at **A** is:
   (A) $7.5\ kN \leftarrow$       (B) $10\ kN \rightarrow$     (C) $7.5\ kN \rightarrow$     (D) $10\ kN \leftarrow$
3. The vertical component of the inclined force at **A** is:
   (A) $10\ kN \uparrow$       (B) $10\ kN \downarrow$     (C) $7.5\ kN \uparrow$     (D) $7.5\ kN \downarrow$
4. The horizontal reaction at the fixed support **D** is:
   (A) $7.5\ kN \leftarrow$       (B) $10\ kN \rightarrow$     (C) $7.5\ kN \rightarrow$     (D) $10\ kN \leftarrow$
5. The vertical reaction at the roller support **B** is:
   (A) $10\ kN \uparrow$       (B) $12\ kN \uparrow$     (C) $7.5\ kN \uparrow$     (D) $12\ kN \downarrow$
6. The vertical reaction at the intermediate hinge **C** is:
   (A) $15\ kN$       (B) $12\ kN$     (C) $30\ kN$       (D) $10\ kN$
7. The vertical reaction at the fixed support **D** is:
   (A) $45\ kN \uparrow$       (B) $12\ kN \uparrow$     (C) $7.5\ kN \uparrow$     (D) $20\ kN \uparrow$
8. The moment reaction at the fixed support **D** is:
   (A) $30\ kN.m\ \circlearrowleft$     (B) $45\ kN.m\ \circlearrowright$     (C) $30\ kN.m\ \circlearrowright$       (D) $15\ kN.m\ \circlearrowright$

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9.  The normal force at **c** is:
    (A) $15\ kN$    (B) zero        (C) $-8\ kN$
10. The shear force at **a** is:
    (A) $15\ kN$    (B) $36\ kN$    (C) $-21\ kN$
11. The shear force just at the left of **b** is:
    (A) zero     (B) $11\ kN$     (C) $-11\ kN$    (D) $7\ kN$
12. The shear force just at the right of **b** is:
    (A) zero       (B) $11\ kN$     (C) $-11\ kN$     (D) $7\ kN$
13. The shear force at **d** is:
    (A) 8        (B) $11\ kN$     (C) $-11\ kN$       (D) $-7\ kN$
14. The shear force at **f** is:
    (A) 15       (B) $11\ kN$     (C) $-11\ kN$       (D) $8\ kN$
15. The bending moment at **a** is:
    (A) $-30\ kN.m$       (B) $45\ kN.m$       (C) $36\ kN.m$       (D) $-36\ kN.m$
16. The bending moment at **c** is:
    (A) $-30\ kN.m$       (B) $45\ kN.m$       (C) zero       (D) $15\ kN.m$
17. The bending moment just at the left of **d** is:
    (A) $-30\ kN.m$       (B) $-2\ kN.m$       (C) $-10\ kN.m$       (D) $15\ kN.m$
18. The bending moment just at the right of **d** is:
    (A) $-30\ kN.m$       (B) $-2\ kN.m$       (C) $-10\ kN.m$       (D) $15\ kN.m$
19. The bending moment at **e** is:
    (A) $16\ kN.m$       (B) $-2\ kN.m$       (C) $-16\ kN.m$       (D) $15\ kN.m$
20. The bending moment at a distance of $4\ m$ from the fixed support **a** is:
    (A) zero       (B) $60\ kN.m$       (C) $-2.25\ kN.m$       (D) $2.25\ kN.m$
21. The maximum positive bending moment for the beam is:
    (A) zero       (B) $16\ kN.m$       (C) $12.25\ kN.m$       (D) $2.25\ kN.m$
22. The maximum negative bending moment for the beam is:
    (A) zero       (B) $-16\ kN.m$       (C) $-12.25\ kN.m$       (D) $-36\ kN.m$

*Please turn over*

23. The horizontal reaction at the fixed support **B** is:
   (A) 8 kN ←     (B) 14 kN →   (C) 8 kN →     (D) 10 kN ←
24. The vertical reaction at the roller support **A** is:
   (A) 10 kN ↑   (B) 14 kN ↑   (C) 8 kN ↑     (D) 14 kN ↓
25. The vertical reaction at the intermediate hinge **C** is:
   (A) 14 kN     (B) 10 kN     (C) 22 kN     (D) 28 kN
26. The vertical reaction at the fixed support **B** is:
   (A) 14 kN ↑   (B) 12 kN ↑   (C) 8 kN ↑   (D) 22 kN ↑
27. The moment reaction at the fixed support **B** is:
   (A) 88 kN.m ↺   (B) 88 kN.m ↻     (C) 8 kN.m ↻     (D) 22 kN.m ↻
28. The normal force between **A** and **C** is:
   (A) -8 kN       (B) 10 kN       (C) 8 kN       (D) zero

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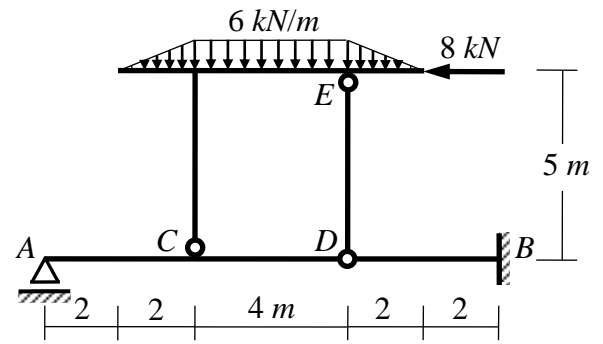
29. The normal force between **a** and **b** is:
   (A) 3 t       (B) -2 t       (C) -5 t     (D) 2 t
30. The normal force between **b** and **c** is:
   (A) 4.243 t   (B) -4.243 t   (C) -5 t     (D) 3 t
31. The normal force between **c** and **d** is:
   (A) 5 t       (B) -3 t       (C) -16 t     (D) 3 t
32. The shear force between **a** and **b** is:
    (A) 5 t       (B) 3 t       (C) -2 t     (D) 2 t
33. The shear force just at the right of **c** is:
   (A) zero     (B) 11 t     (C) -2 t     (D) -3 t
34. The shear force at **e** is:
   (A) 19       (B) 28 t     (C) 13 t     (D) 16 t
35. The bending moment at **d** is:
   (A) -30 t.m     (B) 19 t.m     (C) 36 t.m       (D) -40 t.m
36. The bending moment at **e** is:
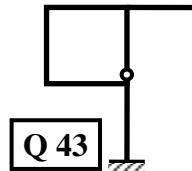   (A) -30 t.m     (B) 19 t.m     (C) 13 t.m     (D) 28 t.m

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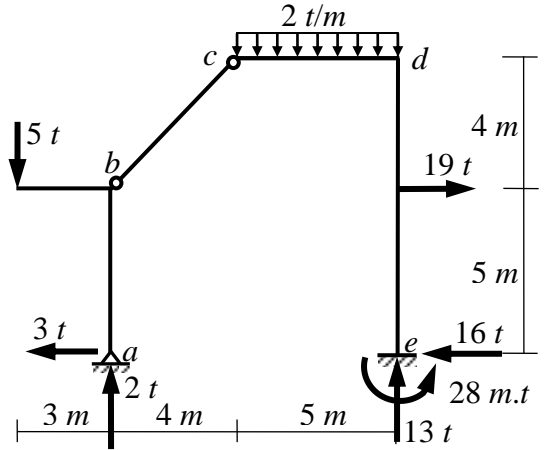
37. The force in the member 1 (*AB*) is:
   (A) 10 kN C   (B) 10 kN T   (C) 5 kN T     (D) zero
38. The force in the member 4 (*BD*) is:
   (A) 10 kN C   (B) 10 kN T   (C) 5 kN T   (D) 5 kN C
39. The force in the member 8 (*DF*) is:
   (A) 10 kN C   (B) 10 kN T   (C) 5 kN T   (D) 5 kN C
40. The force in the member 10 (*EG*) is:
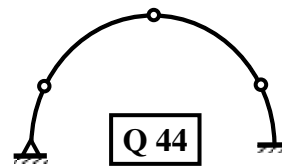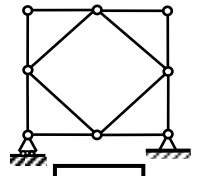   (A) 10 kN C   (B) 10 kN T   (C) 5 kN T   (D) 5 kN C

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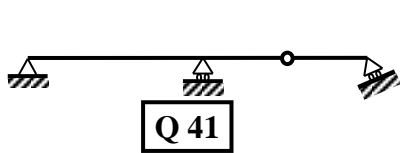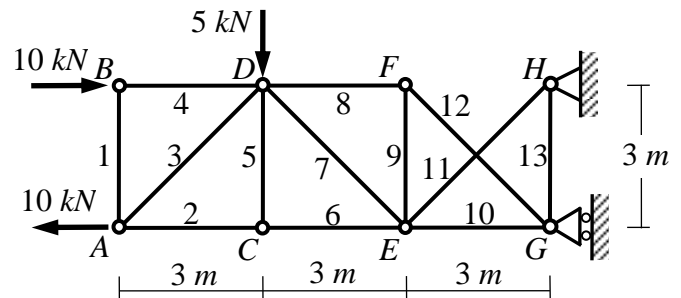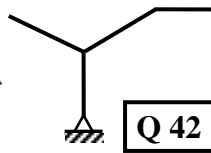
**Q 41**  **Q 42**  **Q 43**  **Q 44**

**Q 45**

41. The shown structure is:
   (A) Unstable   (B) Stat. Det.   (C) Stat. Ind. to the 1st degree   (D) Stat. Ind. to the 2nd degree
42. The shown structure is:
   (A) Unstable   (B) Stat. Det.   (C) Stat. Ind. to the 1st degree   (D) Stat. Ind. to the 2nd degree
43. The shown structure is:
   (A) Unstable   (B) Stat. Det.   (C) Stat. Ind. to the 1st degree   (D) Stat. Ind. to the 2nd degree
44. The shown structure is:
   (A) Unstable   (B) Stat. Det.   (C) Stat. Ind. to the 1st degree   (D) Stat. Ind. to the 2nd degree
45. The shown structure 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**