Ministry of Higher Education
Giza Higher Institute of Engineering & Technology
Civil Engineering Department
Course Name: **Theory of Structures (1)A**
Course Code: **CIV 111**   Date: **15 / 1 / 2022**

Academic Year: **2021/2022**
Semester: **First**
Level: **1st Civil**
Time: **3 Hours**
Examiner: *Dr. M. Abdel-Kader*

GIZA ENGINEERING INSTITUTE

Final Exam

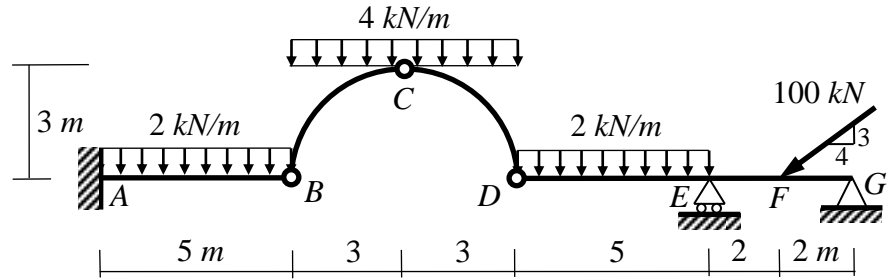Total Marks: **90**   No. of Questions: **45** (Attempt all questions)
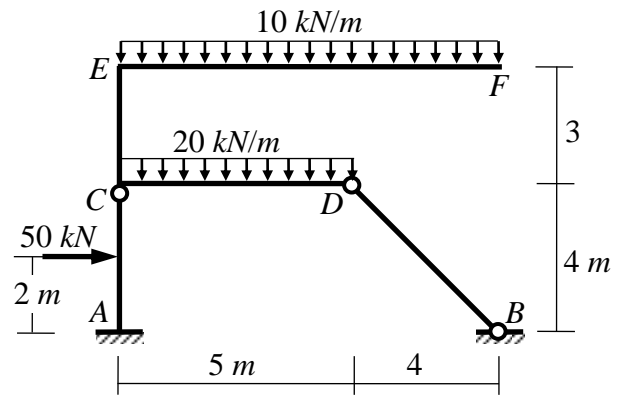
Choose the nearest answer.

1. The horizontal component of the inclined force at **F** is:
   (A) $60\ kN \rightarrow$ (B) $60\ kN \leftarrow$ (C) $80\ kN \leftarrow$ (D) $80\ kN \rightarrow$

2. The vertical reaction at the intermediate hinge **B** is:
   (A) $4\ kN$ (B) $12\ kN$ (C) $24\ kN$ (D) $6\ kN$

3. The horizontal reaction at the intermediate hinge **B** is:
   (A) $24\ kN$ (B) $4\ kN$ (C) $12\ kN$ (D) $6\ kN$

4. The horizontal reaction at the fixed support **A** is:
   (A) $86\ kN \rightarrow$ (B) $6\ kN \rightarrow$ (C) $60\ kN \rightarrow$ (D) $80\ kN \rightarrow$

5. The vertical reaction at the fixed support **A** is:
   (A) $22\ kN \uparrow$ (B) $12\ kN \uparrow$ (C) $10\ kN \uparrow$ (D) $60\ kN \uparrow$

6. The moment reaction at the fixed support **A** is:
   (A) $35\ kN.m \circlearrowleft$ (B) $60\ kN.m \circlearrowleft$ (C) $25\ kN.m \circlearrowleft$ (D) $85\ kN.m \circlearrowleft$

7. The vertical reaction at the roller support **E** is:
   (A) $60\ kN \uparrow$ (B) $82\ kN \uparrow$ (C) $10.5\ kN \uparrow$ (D) $73.25\ kN \uparrow$

8. The horizontal reaction at the hinged support **G** is:
   (A) $80\ kN \rightarrow$ (B) $54\ kN \rightarrow$ (C) $74\ kN \rightarrow$ (D) $86\ kN \rightarrow$

9. The vertical reaction at the hinged support **G** is:
   (A) $8.75\ kN \uparrow$ (B) zero   (C) $22\ kN \uparrow$ (D) $71.5\ kN \uparrow$

10. For the shown simple beam in (1), the B.M.D is:
    (A) A   (B) B   (C) C   (D) None

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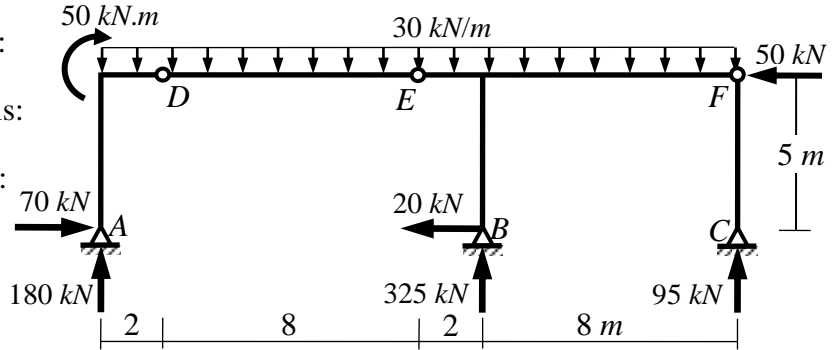   (A) A   (B) B   (C) C   (D) None

12. The normal force at **c** is:
    (A) $-9\ kN$ (B) $-12\ kN$ (C) $-15\ kN$

13. The shear force at **a** is:
    (A) zero   (B) $-30\ kN$ (C) $30\ kN$

14. The shear force just at the right of **b** is:
    (A) zero   (B) $-9\ kN$ (C) $21\ kN$

15. The shear force at **d** is:
    (A) $-9\ kN$ (B) $12\ kN$ (C) $15\ kN$ (D) $9\ kN$

16. The bending moment at **b** is:
    (A) $21\ kN.m$ (B) $-30\ kN.m$ (C) $-60\ kN.m$ (D) $-42\ kN.m$

17. The bending moment at **c** is:
    (A) $9\ kN.m$ (B) $-9\ kN.m$ (C) $-15\ kN.m$ (D) $-12\ kN.m$

18. The bending moment at a distance of $3\ m$ from the hinged support **b** is:
    (A) $27\ kN.m$ (B) $63\ kN.m$ (C) $6\ kN.m$ (D) $32\ kN.m$

19. The maximum positive bending moment in the beam is at a distance of ….. from the hinged support **b**:
    (A) $1.9\ m$ (B) $2.5\ m$ (C) $3\ m$ (D) $3.5\ m$

20. The maximum positive bending moment in the beam is:
    (A) $30.5\ kN.m$ (B) $65.72\ kN.m$ (C) $33.25\ kN.m$ (D) $6.75\ kN.m$
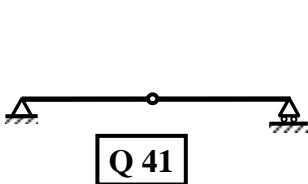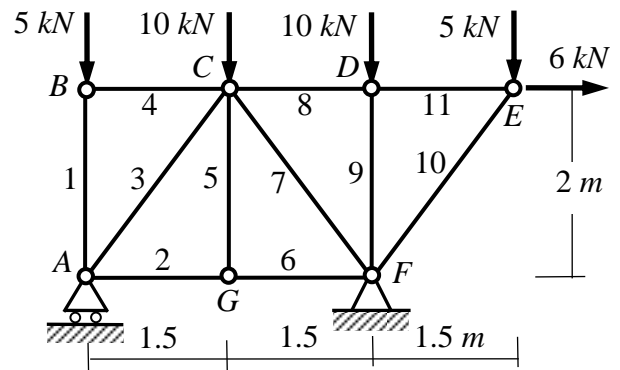
Please turn over

21. The value of the force in the link member **BD** is:
    (A) 185.3 kN   (B) 28.8 kN   (C) 20 kN   (D) 131 kN
22. The horizontal reaction at the hinged support **B** is:
    (A) 131 kN ←   (B) 20 kN ←   (C) 20 kN →   (D) 185.3 kN ←
23. The vertical reaction at the hinged support **B** is:
    (A) 20 kN ↓   (B) 20 kN ↑   (C) 131 kN ↑   (D) 90.8 kN ↑
24. The horizontal reaction at the fixed support **A** is:
    (A) 181 kN →   (B) 81 kN →   (C) 50 kN →   (D) 50 kN ←
25. The vertical reaction at the fixed support **A** is:
    (A) 100 kN ↑   (B) 190 kN ↑   (C) 95 kN ↑   (D) 59 kN ↑
26. The moment reaction at the fixed support **A** is:
    (A) 242 kN.m ↻   (B) 424 kN.m ↻   (C) 100 kN.m ↻   (D) 250 kN.m ↻
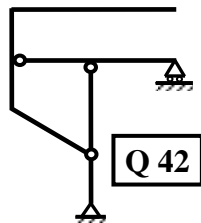
27. The normal force in the left column above **A** is:
    (A) -70 kN   (B) 70 kN   (C) -180 kN   (D) 180 kN
28. The normal force in the right column above **C** is:
    (A) zero   (B) 50 kN   (C) -95 kN   (D) -50 kN
29. The normal force in the part **DE** of the beam is:
    (A) -180 kN   (B) -70 kN   (C) -20 kN   (D) -50 kN
30. The shear force in the left column above **A** is:
    (A) -70 kN   (B) -180 kN   (C) zero   (D) -50 kN
31. The shear force in the beam at **D** is:
    (A) 120 kN   (B) 180 kN   (C) 60 kN   (D) 50 kN
32. The maximum negative bending moment in the left column is:
    (A) -250 kN.m   (B) -70 kN.m   (C) -50 kN.m   (D) -350 kN.m
33. The maximum positive bending moment in the part **DE** of the beam is:
    (A) 120 kN.m   (B) 50 kN.m   (C) 30 kN.m   (D) 240 kN.m
34. The maximum positive bending moment in the part **EF** of the beam is:
    (A) 150 kN.m   (B) 240 kN.m   (C) 250 kN.m   (D) 50 kN.m
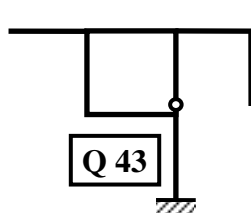
35. The horizontal reaction at the hinged support **F** is:
    (A) 30 kN ←   (B) 6 kN ←   (C) 11 kN ←   (D) zero
36. The vertical reaction at the hinged support **A** is:
    (A) 24 kN ↑   (B) 3.5 kN ↑   (C) 30 kN ↑   (D) 12 kN ↑
37. The force in the member 1 (**AB**) is:
    (A) 5 kN C   (B) 5 kN T   (C) 3.5 kN C   (D) 30 kN C
38. The force in the member 4 (**BC**) is:
    (A) zero   (B) 5 kN T   (C) 5 kN C   (D) 10 kN T
39. The force in the member 8 (**CD**) is:
    (A) 3.75 kN T   (B) 15 kN T   (C) 9.75 kN T   (D) 3.75 kN C
40. The force in the member 3 (**AC**) is:
    (A) 5.875 kN T   (B) 14.14 kN T   (C) 7.07 kN T   (D) 1.875 kN T
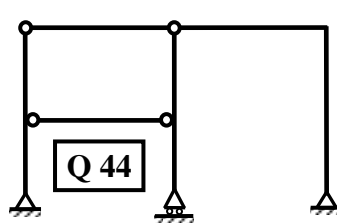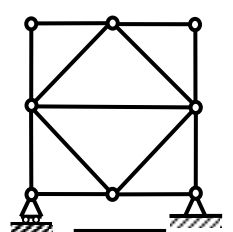
Q 41

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