Unit 4 - Week 3

Assignment 3

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-02-19, 23:59 IST.

1) The supporting force R_A and moment M_A at A for the loaded cantilever beam as shown in Figure 1 are (CW stands for Clockwise and CCW stands for Counter Clockwise): *1 point*

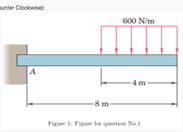

Figure 1: Figure for question No.1

- $R_A = 2.4$ kN, $M_A = 14.4$ kN.m CCW
- $R_A = 2.4$ kN, $M_A = 0$ kN.m
- $R_A = 2.4$ kN, $M_A = 14.4$ kN.m CW
- $R_A = 0$ kN, $M_A = 14.4$ kN.m CCW

No, the answer is incorrect.
Score: 0
Accepted Answers:
$R_A = 2.4$ kN, $M_A = 14.4$ kN.m CCW

2) A beam is subjected to the variable loading as shown in Figure 2. The support reactions at A and B are: *1 point*

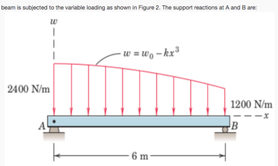

Figure 2: Figure for question No.2

- $R_A = 15.76$ kN, $R_B = 16.84$ kN
- $R_A = 5.76$ kN, $R_B = 6.84$ kN
- $R_A = 6.84$ kN, $R_B = 5.76$ kN
- $R_A = 16.84$ kN, $R_B = 15.76$ kN

No, the answer is incorrect.
Score: 0
Accepted Answers:
$R_A = 6.84$ kN, $R_B = 5.76$ kN

3) The reaction at A due to the uniform loading and the applied couple as shown in Figure 3 (CW stands for Clockwise and CCW stands for Counter Clockwise) is *1 point*

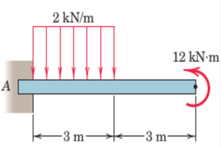

Figure 3: Figure for question No.3

- $R_A = 6$ kN, $M_A = 3$ kN.m CCW
- $R_A = 6$ kN, $M_A = 3$ kN.m CW
- $R_A = 3$ kN, $M_A = 6$ kN.m CW
- $R_A = 3$ kN, $M_A = 6$ kN.m CCW

No, the answer is incorrect.
Score: 0
Accepted Answers:
$R_A = 6$ kN, $M_A = 3$ kN.m CW

4) Consider the loaded cantilever beam as shown in the Figure 4. The **magnitudes** of shear force V and bending moment M produced in the beam at x = l/2 by the concentrated load are: *1 point*

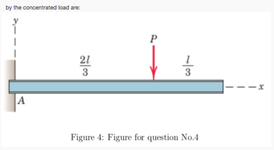

Figure 4: Figure for question No.4

- $V = 0.25P, M = \frac{Pl}{3}$
- $V = 0.5P, M = \frac{Pl}{4}$
- $V = P, M = \frac{Pl}{6}$
- $V = 2P, M = \frac{Pl}{7}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$V = P, M = \frac{Pl}{6}$

5) Consider the loaded simple supported beam as shown in Figure 5. The **magnitudes** of the shear force and bending-moment at the middle of the beam are (You can draw the shear-force and bending moment diagrams during solving) *1 point*

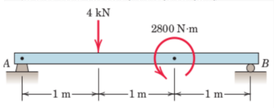

Figure 5: Figure for question No.5

- 200 N, 3400 N.m
- 800 N, 2400 N.m
- 400 N, 3400 N.m
- 600 N, 3400 N.m

No, the answer is incorrect.
Score: 0
Accepted Answers:
400 N, 3400 N.m

6) The beam supports a uniform unit load w as shown in Figure 6. Determine the location x of the two supports so as to minimize the maximum bending moment M max in the beam and specify the expression of M max. (Choose the correct option) *1 point*

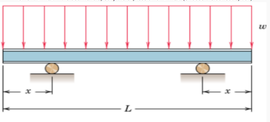

Figure 6: Figure for question No.6

- x = 0.207L, $M_{max} = 0.0214wl^2$
- x = 20.7L, $M_{max} = 0.0214wl^2$
- x = 0.207L, $M_{max} = 21.4wl^2$
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
x = 0.207L, $M_{max} = 0.0214wl^2$

7) Consider the loaded simple supported beam shown in Figure 7. The maximum bending moment M_{max} produced in the beam due to this loading is *1 point*

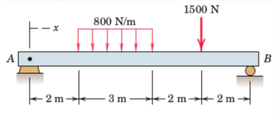

Figure 7: Figure for question No.7

- $M_{max} = 5620$ N.m
- $M_{max} = 6620$ N.m
- $M_{max} = 2810$ N.m
- $M_{max} = 1405$ N.m

No, the answer is incorrect.
Score: 0
Accepted Answers:
$M_{max} = 5620$ N.m

8) Repeat Problem.7, where the 1500 N load has been replaced by the 4.2 kN.m couple. Now the maximum bending moment M_{max} produced in the beam due to loading will be (see Figure 8) *1 point*

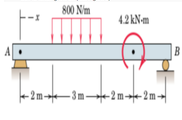

Figure 8: Figure for question No.8

- $M_{max} = 2800$ N.m
- $M_{max} = 1400$ N.m
- $M_{max} = 2400$ N.m
- $M_{max} = 400$ N.m

No, the answer is incorrect.
Score: 0
Accepted Answers:
$M_{max} = 2800$ N.m

9) A 2m high and 1.5m wide rectangular frame ABCD is loaded with a 1.5 kN horizontal force at B and a 2 kN vertical force at C as shown in Figure 9. The magnitudes of internal forces (shear - V , tension/compression - T) and moments (bending moment - M) at the mid-section e-e of the vertical leg AB will be *1 point*

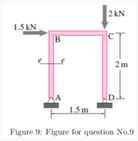

Figure 9: Figure for question No.9

- V = 3.5 kN, T = 2.5 kN, M = 3.5 kN.m
- V = 1.5 kN, T = 2 kN, M = 1.5 kN.m
- V = 1.5 kN, T = 1.5 kN, M = 1.5 kN.m
- V = 1.5 kN, T = 2.5 kN, M = 1.5 kN.m

No, the answer is incorrect.
Score: 0
Accepted Answers:
V = 1.5 kN, T = 2 kN, M = 1.5 kN.m