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Assignment 6

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

Due on 2021-03-03, 23:59 IST.

1) An infinite beam of cross section 0.25m (b) x 0.2m (h) subjected to a concentrated load of 100 kN. Calculate the deflection of the beam at the point of application of the load. The bending stiffness of the beam (EI) is 1.67 × 10^3 kN-m^2 and k_0 = 60000 kN/m^2/m. *1 point*

a) 6.3 mm
b) 4.1 mm
c) 1.1 mm
d) 0.8 mm

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
b)

2) An infinite beam of cross section 0.25m (b) x 0.2m (h) subjected to a concentrated load of 100 kN. Calculate the bending moment of the beam at the point of application of the load. The bending stiffness of the beam is 1.67 × 10^3 kN-m^2 and k_0 = 60000 kN/m^2/m. *1 point*

a) 20.43 kN-m
b) 42.36 kN-m
c) 12.58 kN-m
d) 56.32 kN-m

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
a)

3) An infinite beam of cross section 0.25m (b) x 0.2m (h) subjected to a concentrated load of 100 kN. Calculate the deflection of the beam at a distance of 1.5m towards the left side from the point of application of the load (i.e x<0 direction). The bending stiffness of the beam is 1.67 × 10^3 kN-m^2 and k_0 = 60000 kN/m^2/m. *1 point*

a) +5.32 mm
b) -2.55 mm
c) +0.93 mm
d) +0.46 mm

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
d)

4) An infinite beam of cross section 0.25m (b) x 0.2m (h) subjected to a concentrated load of 100 kN. Calculate the shear force of the beam at a distance of 1.5m towards the left side from the point of application of the load (i.e x < 0 direction). The bending stiffness of the beam is 1.67 × 10^3 kN-m^2 and k_0 = 60000 kN/m^2/m. *1 point*

a) -6.5 kN
b) +6.5 kN
c) -2.1 kN
d) +2.1 kN

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
c)

5) An infinite beam of cross section 0.25m (b) x 0.2m (h) subjected to a concentrated moment of 100 kN-m (clockwise). Calculate the shear force of the beam at a distance of 1.5m towards the left side from the point of application of the moment (i.e x < 0 direction). The bending stiffness of the beam is 1.67 × 10^3 kN-m^2 and k_0 = 60000 kN/m^2/m. *1 point*

a) -9.53 kN
b) -6.86 kN
c) 12.53 kN
d) 2.95 kN

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
b)

6) A soil supports a semi-infinite beam with free end. The beam carries a point load of 100 kN, at a distance of 1.5 m from the free end. Calculate the value of deflection in the beam below the point load if the bending stiffness of the beam is 1.67 × 10^3 kN-m^2. (k = 15000 kN/m^2). *1 point*

a) 1.23 mm
b) 4.25 mm
c) 9.35 mm
d) 0.93 mm

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
b)

7) For a beam resting on Winkler spring soil model; what will be the expression of width of the beam used in the governing differential equation $E^*I\frac{d^4w}{dx^4} + b^*kw = 0$ if the beam has finite width? [Note: b is the width of the beam, G is the shear modulus, H is the thickness of the shear layer and k is the modulus of subgrade reaction] *1 point*

a) $b^* = b\left[1 - \sqrt{\frac{GH}{b^2k}}\right]$
b) $b^* = b\left[1 + \sqrt{\frac{GH}{b^2k}}\right]$
c) $b^* = b$
d) $b^* = \left[1 + \sqrt{\frac{GH}{k}}\right]$

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
c)

8) A strip footing of width B and length L (L>>B) is analyzed as a beam under plane-strain condition. What would be the length and width of the beam? *1 point*

a) L, B
b) B, 1
c) L, 1
d) 1, L

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
b)

9) A beam is resting on two-parameter model with Shear Modulus and thickness of the shear layer is G and H, respectively. The beam is analyzed under plane-strain condition. Which of the following boundary condition is most appropriate at the edge of the beam? (Where w_b is the defection within the beam region, w_f is the deflection beyond the beam region, Q is the shear force, l is the length of the beam). The beam is subjected to UDL and both the ends are free-end. *1 point*

a) $Q = GH\left(\frac{dw_f}{dx} - \frac{dw_b}{dx}\right)$
b) $\frac{dw_b}{dx} = 0$
c) $Q = 0$
d) $\frac{dw_f}{dx} = 0$

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
a)

10) For a beam resting on Two-Parameter soil model; what will be the expression of width of the beam if the beam has finite width? [Note: b is the width of the beam, G is the shear modulus, H is the thickness of the shear layer and k is the modulus of subgrade reaction] *1 point*

a) $b^* = b\left[1 - \sqrt{\frac{GH}{b^2k}}\right]$
b) $b^* = b\left[1 + \sqrt{\frac{GH}{b^2k}}\right]$
c) $b^* = b$
d) $b^* = \left[1 + \sqrt{\frac{GH}{k}}\right]$

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
b)