YOUTUBE QUESTIONS PRACTICE

STRENGTH OF MATERIAL

★ Properties of Material ★

Q :) If a uniform bar is supported at one in a vertical direction and loaded at the bottom end by a load equal by a load equal to weight of the bar, the strain energy as compared to that due to self weight will be:

A : Same

B : Half

C : Twice

D : Thrice

Q :) Which of the following materials is expected to have least value of Young's modulus of elasticity?

A : Wood

B : Copper

C : Glass

D : Aluminium

Q :) The area under stress strain curve represents_____.

A : Breaking strength of material

B : Toughness of material

C : Hardness of material

D : Energy required to cause failure

Q :) A steel rod of sectional area 25 sq.mm connects two parallel walls 5 m apart. The nuts at the ends were tightened when the rod was heated at 100°C.If α_{steel}=0.000012°C, E_{steel} = 0.2 MN/mm^2.The tensile force developed at a temperature of 50°C is ____.

A : 80 N/mm^2

B : 120 N/mm^2

C : 130 N/mm^2

D : 150 N/mm^2

Q :) In terms of bulk modulus (K) and modulus of rigidity (G), the poisson’s ratio can be expressed

a. (3K – 4G) / (6K + 4G)
b. (3K + 4G) / (6K - 4G)
c. (3K – 2G) / (6K + 2G)
d. (3K + 2G) / (6K - 4G)

Q :) The stress at which a material fractures under large number of reversal of stress is called.

a. Endurance limit

b. Creep

c. Ultimate strength

d. Residual stress

Q :) Match List-I with List-II and select the correct answer

List –I	List –II
A. Young's modulus B. Poisson's ratio C. Bulk modulus D. Rigidity modulus	1. Lateral strain to linear strains within elastic limit 2. Stress to strain within elastic limit 3. Shear stress to shear strain within elastic limit 4. Direct stress to corresponding volumetric strain

Codes :

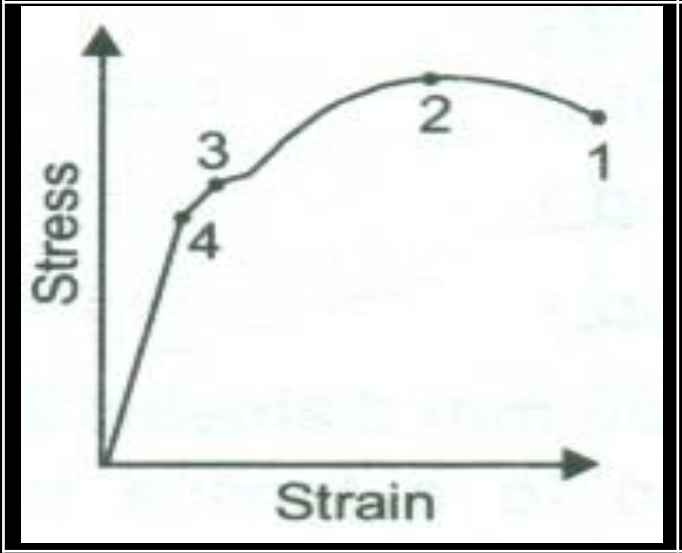
a. A – 3, B – 4, C – 1, D – 2

b. A – 4, B – 3, C – 1, D – 2

c. A – 3, B – 4, C – 2, D – 1

d. A – 4, B – 3, C – 2, D – 1

Q :) Match List-I (Properties) with List-II (Stress points labelled 1, 2, 3 and 4) and select the correct answer

List –I I	List –I
	A. Yield point B. Proportional limit C. Rupture strength D. Ultimate strength

Codes :

a. A – 3, B – 4, C – 1, D – 2
b. A – 4, B – 3, C – 1, D – 2
c. A – 3, B – 4, C – 2, D – 1
d. A – 4, B – 3, C – 2, D – 1

Q :) If all the dimensions of a prismatic bar are doubled, then the maximum stress produced in it under its own weight will

a. Decrease
b. Remain unchanged
c. Increase to two times
d. Increase to four times

Q :) Limiting values of poisson’s ratio are

a. -1 and 0.5

b. -1 and -0.5

c. 1 and -0.5

d. 0 and 0.5

Q :) The elongation of a conical bar under its own weight is equal to

a. That of a prismatic bar of same length
b. One half that of a prismatic bar of same length
c. One third that of a prismatic bar of same length
d. One fourth that of a prismatic bar of same length

Q :) If a composite bar of steel and copper is heated, then the copper bar will be under

a. Tension
b. Compression
c. Shear
d. Torsion

★S.F.D & B.M.D★

Q :) A beam fixed at both ends carries a UDL on entire length. The ratio of bending moment at the support to the bending moment at mid span is given by:

A : 0.5

B : 1.0

C : 1.5

D : 2.0

Q :) A simple supported beam is carrying distributed 'Zero' intensity over one support to linearly varying nature of intensity's' over the other support. The shape of BMD will be:

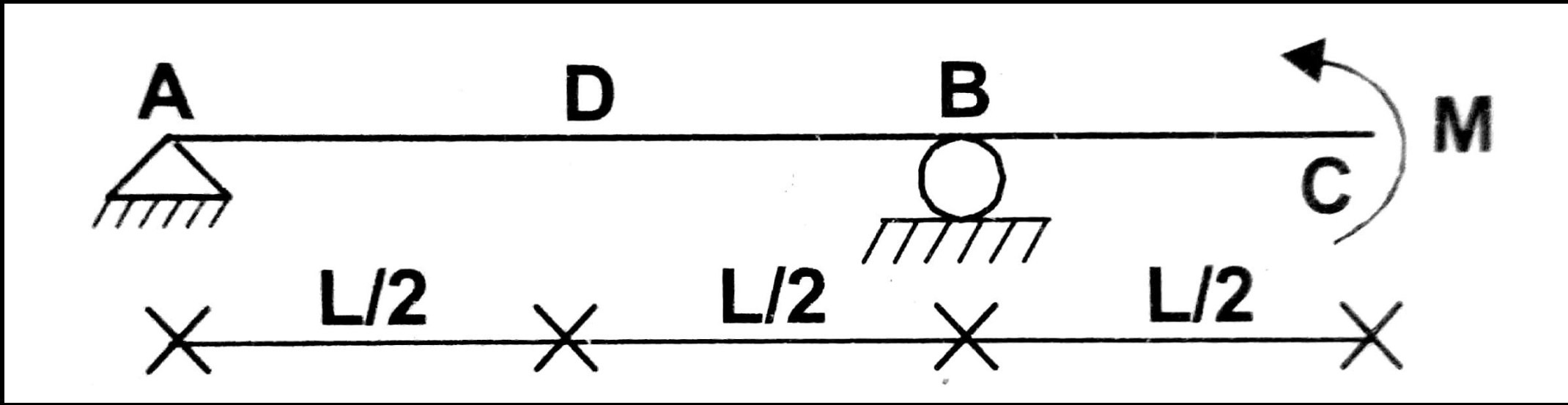
A : Linear

B : Parabolic

C : Cubical parabolic

D : zero

Q :) Shear force at the mid- span point D in the following beam is



A : Zero

B : 2M\L

C : M\L

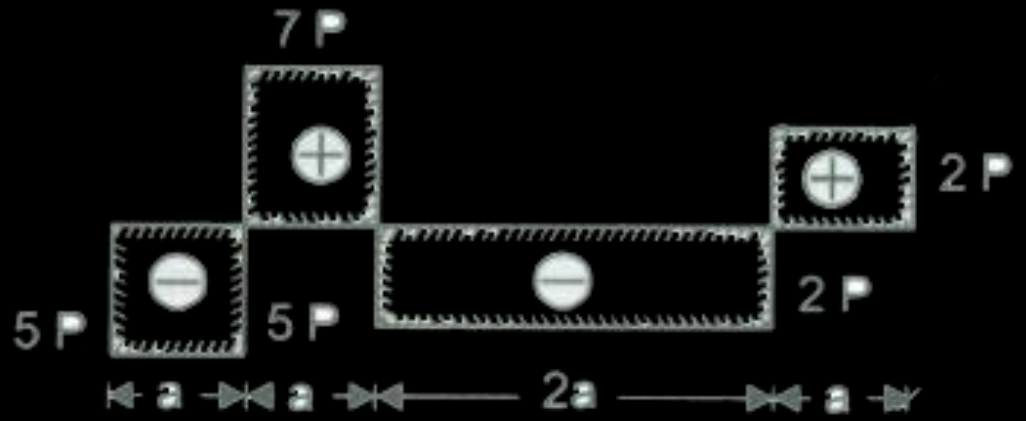
D : 3M\L

Q :) Match List-I (Type and position of force on cantilever) with List-II (Shape of moment diagram for cantilever) and select the correct answer using the codes given below the lists:

List-I	List-II
A. Carrying linearly varying load from zero at its free end and maximum at the fixed end	1. Parabola
B. Subjected to uniformly distributed load	
C. Carrying concentrated load at its free end	2. Rectangle
D. Whose free end is subjected to a couple	3. Cubic parabola
Codes :	4. Triangle

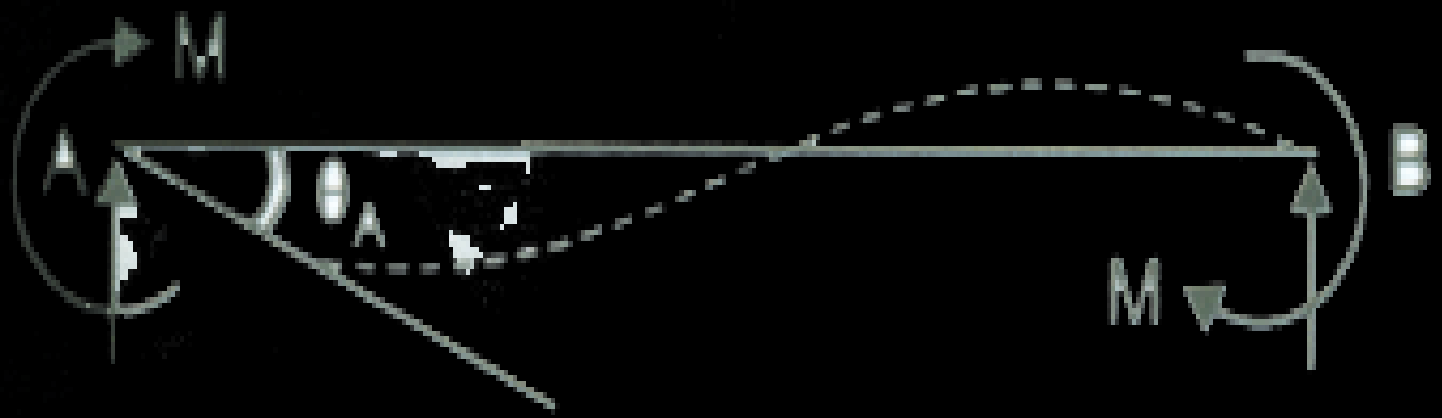
a. A – 1, B – 2, C – 3, D – 4
b. A – 4, B – 3, C – 2, D – 1
c. A – 3, B – 1, C – 4, D – 2
d. A – 1, B – 3, C – 4, D – 2

Q :) The shear force diagram of a beam is shown in the figure, the absolute maximum bending moment in the beam is



a. (2 P x a)
b. (5 P x a)
c. (4 P x a)
d. (7 P x a)

A beam (EI = constant) of span L is subjected to clockwise moments M at both the ends A and B. the rotation of end A works out to be



a. ML / 2 EI
b. ML / 3 EI
c. ML / 4 EI
d. ML / 6 EI

Q :) The defference in ordinate of the shear curve between any two sections is equal to the area under

a. Load curve between these two sections
b. Shear curve between these two sections
c. Bending moment curve between these two sections
d. Load curve between these two sections

Q :) The variation of the bending moment in the portion of a beam carrying linearly varying load is

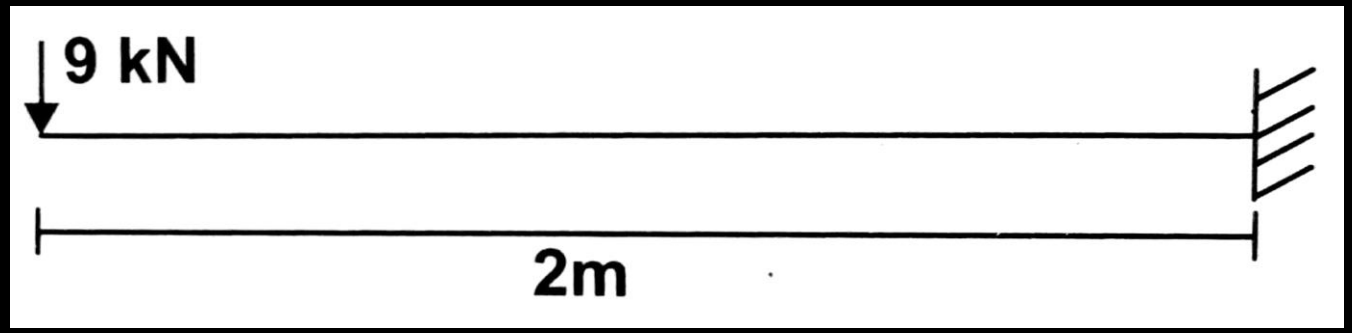
a. Linear
b. Parabolic
c. Cubic
d. Constant

Q :) The maximum bending moment due to a moving load on a fixed ended beam occurs

a. At a support
b. Always at the midspan
c. Under the load only
d. None of the above

★ Deflection of Beam ★

Q :) A cantilever beam is shown in the figure. Find the magnitude and direction of moment to be applied at free end for zero vertical deflection



A : 9 kN-m clockwise

B : 9 kN-m anti-clockwise

C : 12 kN-m clockwise

D : 12kN-m anti-clockwise

Q :) The deflection of beam may be decreased by

A : Increasing the depth of beam

B : Increasing the span

C : Decreasing the depth of beam

D : Increasing the width of beam

Q :) A simply supported beam A carries a point load at its mid span. Another identical beam B carriers the same load but uniformly distributed over the entire span. The ration of the maximum deflections of the beam A and B will be

A : 2/3

B : 3/2

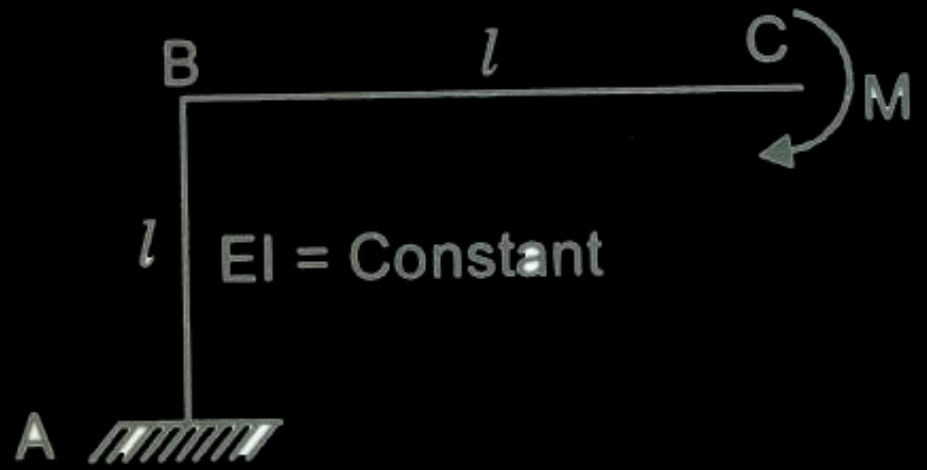
C : 5/8

D : 8/5

Q :) A beam simply-supported at both the ends , of length l carries two equal unlike couples M at two ends. If the flexural rigidity EI = constant, then the central defection of beam is given by

a. $M l^2 / 4 EI$
b. $M l^2 / 16 EI$
c. $M l^2 / 64 EI$
d. $M l^2 / 8 EI$

Q :) What is the horizontal deflection of free end C of the frame shown in the given figure



a. M l^2 /2 EI
b. M l^2 / EI
c. 3 M l^2 / 2 EI
d. 2M l^2 / EI

Q :) The strain energy in a member is proportional to

a. Total strain multiplied by the volume of the member
b. Product of stress and the corresponding strain
c. Product of strain and young’s modulus of the material
d. The maximum strain multiplied by the length of the member

Q :) A beam ABC rests on simple supports at A and B with BC as an overhangs. D is centre of span AB. If in the first case a concentrated load P acts at C while in the second case load P acts at D, then the

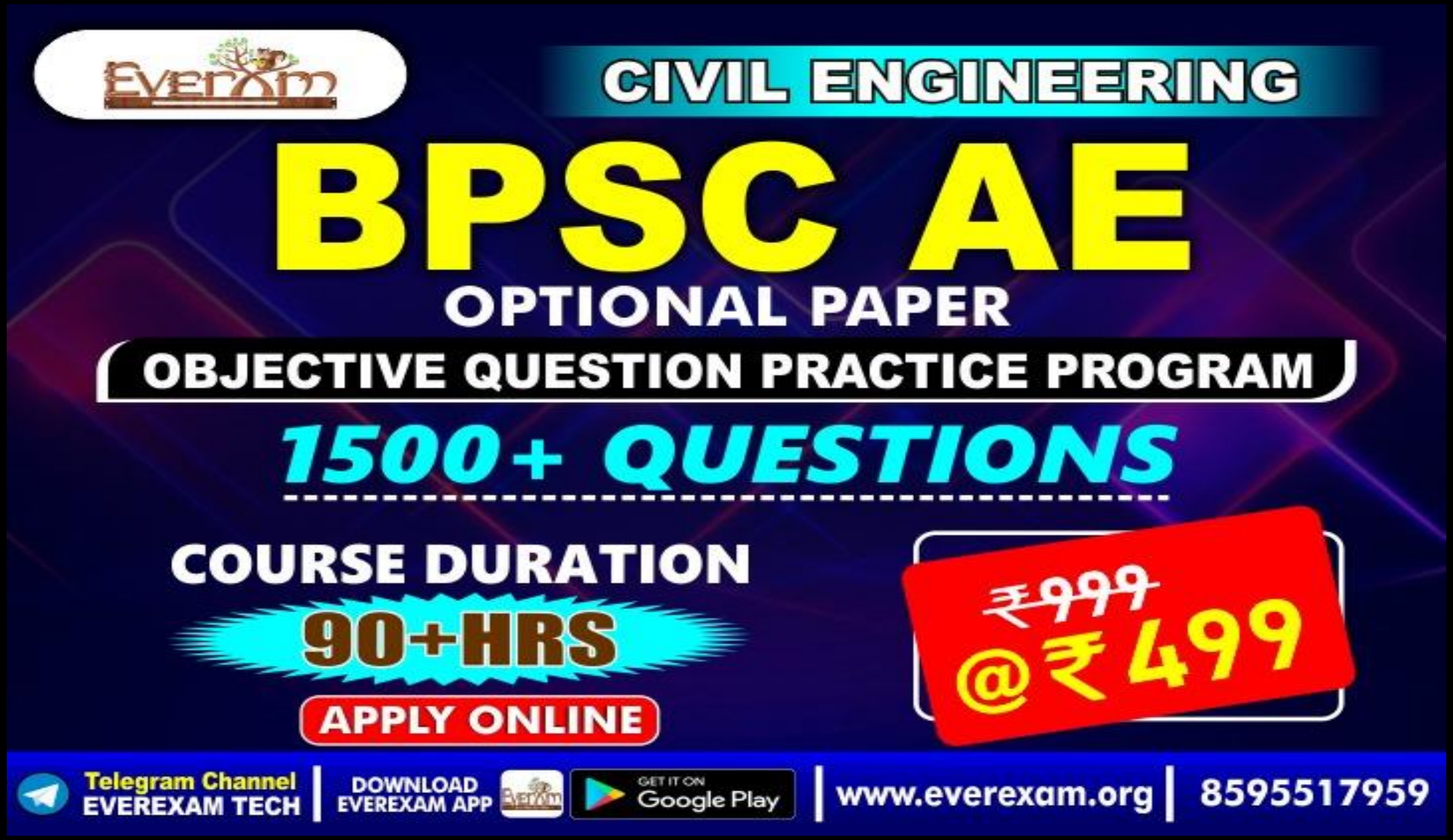
a. Deflection at D in the first case will be equal to the deflection at C in the second case
b. Deflection at C in the first case is equal to the deflection at D in the second case
c. Deflection at D in the first case will always be smaller than than the deflection at C in the second case
d. Deflection at D in the first case will always be greater than the deflection at C in the second case

Q :) If the deflection at the free end of a uniformly loaded cantilever beam is 15mm and the slope of the deflection curve at the free end is 0.02 radian, then the length of the beam is

a. 0.8 m
b. 1m
c. 1.2 m
d. 1.5m

Q :) If the deflection at the free end of a uniformly loaded cantilever beam of length l m is equal to 7.5 mm, then the slope at the free end is

a. 0.01 radian
b. 0.015 radian
c. 0.02 radian
d. None of the above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