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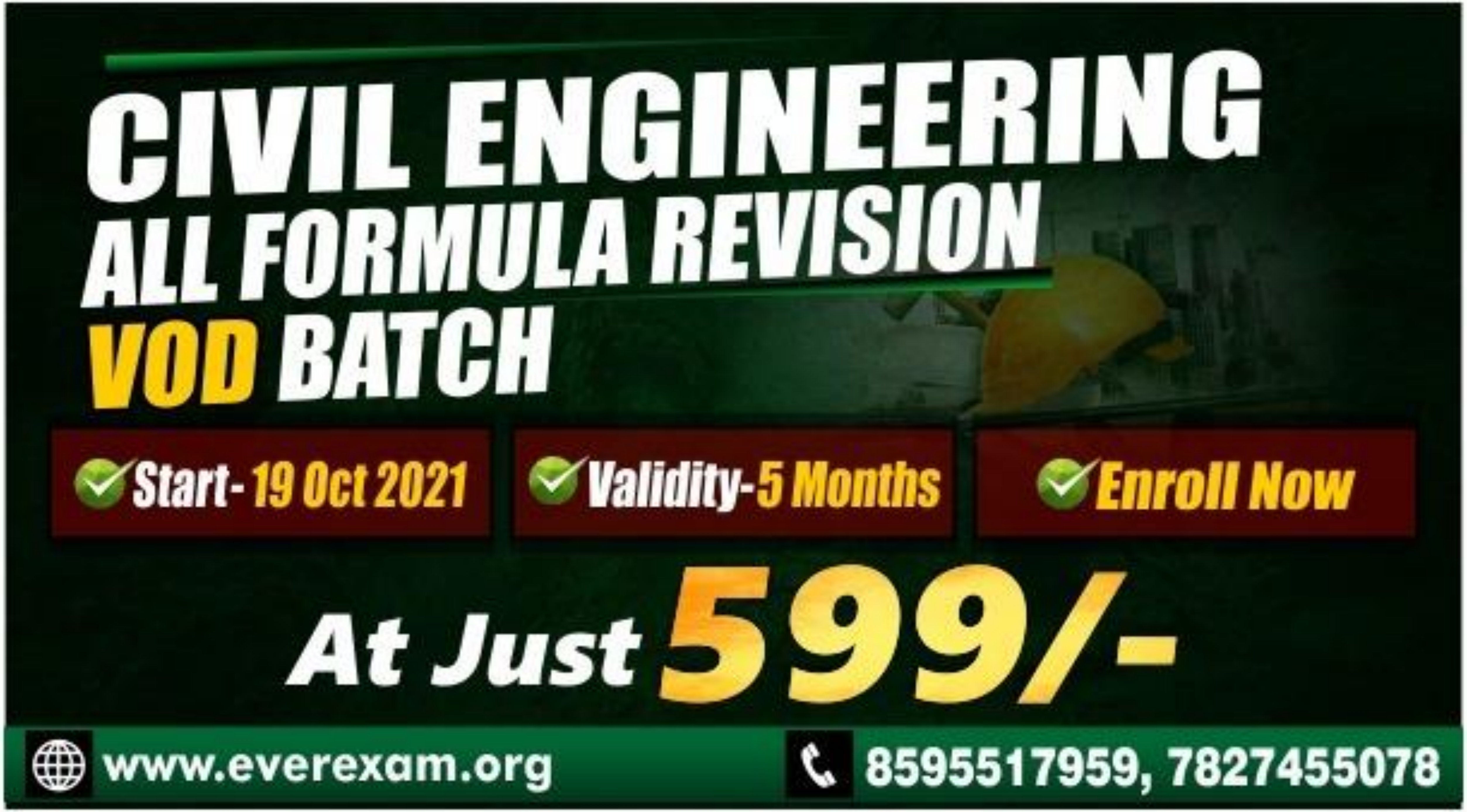
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Q :) If the span of a real beam is, l, the span of the corresponding conjugate beam is

A : $\frac{l}{2}$

B : l

C : 2l

D : l × number of supports

Q :) The bending moment of a section is maximum where shear force is-

A : Minimum

B : Maximum

C : Changing sign or zero

D : None of these

Q :) If Z and I are the section modulus and moment of inertia of the section, the shear force F and bending moment M at a section are related by

A : F = $\frac{MY}{I}$

B : f = $\frac{M}{Z}$

C : F = $\frac{dM}{dx}$

D : F = $\int F dx$

Q :) The loading on the conjugate beam will be

A : Loading on the real beam divided by EI

B : B.M. diagram multiplied by EI

C : B.M. diagram divided by S.F. diagram

D : B.D. diagram, divided by EI

Q :) When a load on the free end of a cantilever beam is increased, failure will occur-

A : At the free end

B : At the fixed end

C : In the middle of the beam

D : At a distance 2l/3

Q :) If a cantilever beam is subjected to a point load at its free end, then the shear force under the point load is:

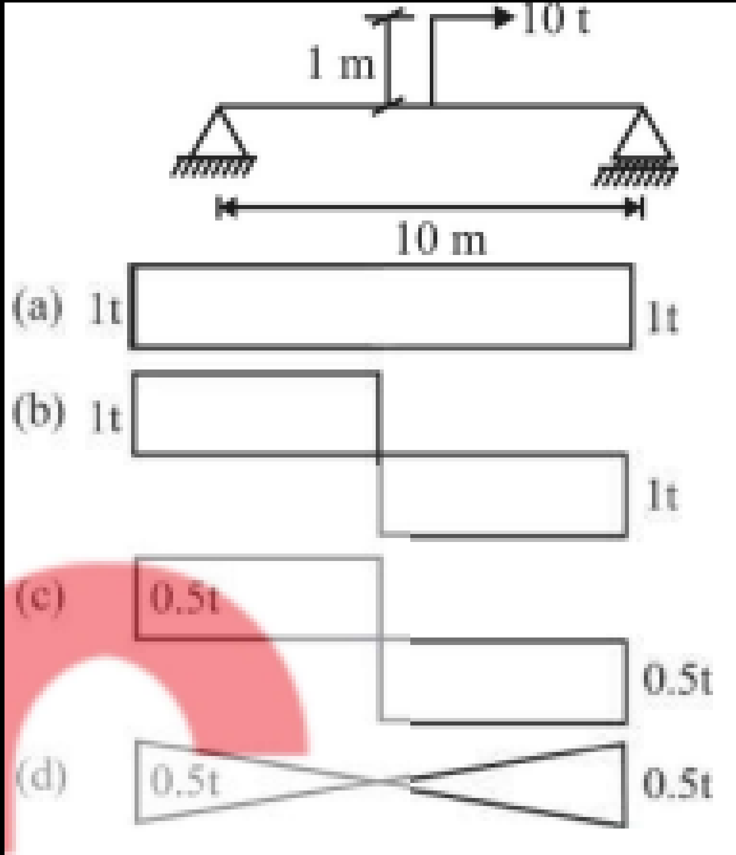
A : Zero

B : Less then the load

C : More than the load

D : Equal to the load

Q :) The shear force diagram (SFD) for the beam shown in figure is



Q :) The ratio of load carrying capacity of a fixed beam to that of a cantilever of same span. Having same maximum bending moment under u.d.l. throughout the span is

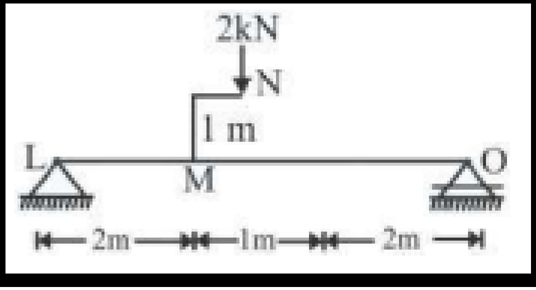
A : 6

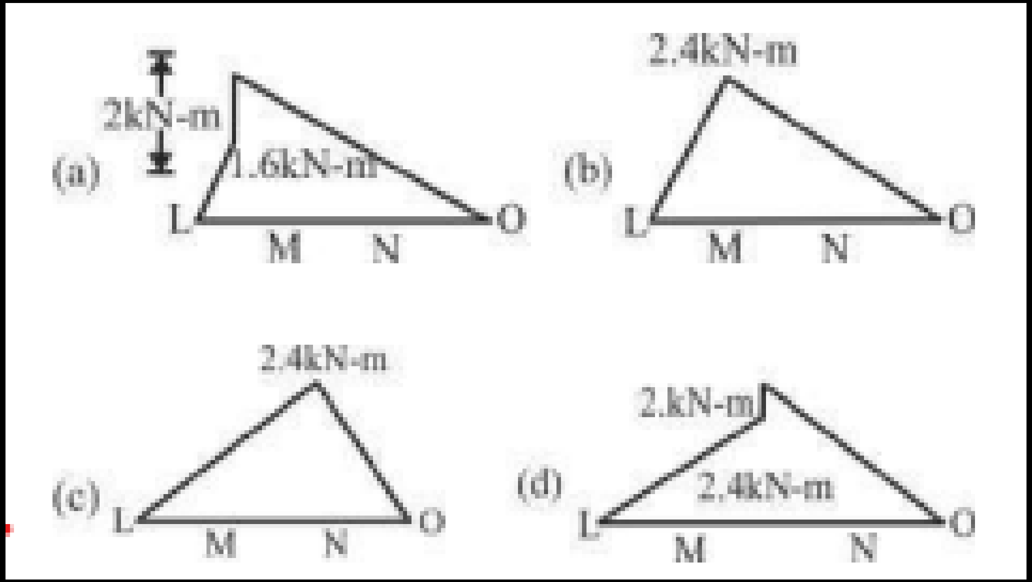
B : 3

C : 4

D : 2

Q :) The bending moment diagram of the beam shown on figure is





Q :) If width of rectangular cross section beam is increased by ten folds and keeping cross sectional area unchanged then maximum shear stress will be:

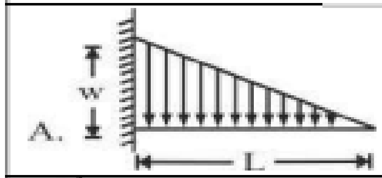
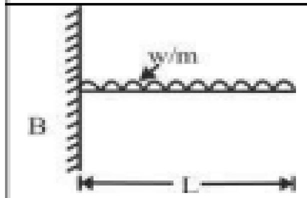
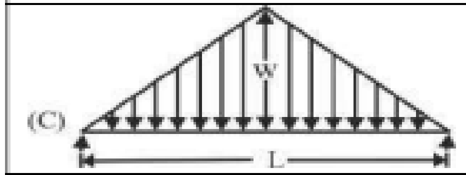
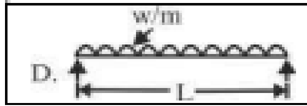
A : Increased by 10 times

B : Reduced by 1/10th

C : Increased by five times

D : Remains unatered

Q :) Match List-I (Type of beam with loading) with List-II (maximum bending moment value) and select the correct answer given below the lists:

List-I/सूची-I	List-II/सूची-II
	1. $\frac{WL^2}{12}$
	2. $\frac{WL^2}{6}$
	3. $\frac{wL^2}{2}$
	4. $\frac{wL^2}{8}$

A : 4, 3, 2, 1

B : 1, 3, 2, 4

C : 2, 3, 1, 4

D : 2, 4, 1, 3

Q :) In a propped cantilever subjected to u.d.l. throughout the span, the point of contraflexure will occur at

A : l/2

B : l/4 from propped end

C : l/4 for fixed end

D : Propped end

Q :) A simply supported beam carries a udl/unit length over the left most quarter span. If L is the span of the beam, the bending moment at mid span is:

A : $\frac{wL}{64}$

B : $\frac{wL}{32}$

C : $\frac{wL^2}{64}$

D : $\frac{wL^2}{32}$

Q :) If a point load acting at the mid span of a fixed beam of uniform section produces fixed end moments of 6-kNm, then same load spread uniformly over the entire span will produce fixed end moments equal to :

A : 20 kNm

B : 30 kNm

C : 40kNm

D : 45kNm

Q :) A beam is simply supported at end A and fixed at B. If a moment M is applied at the free end. The moment developed at the fixed end will be

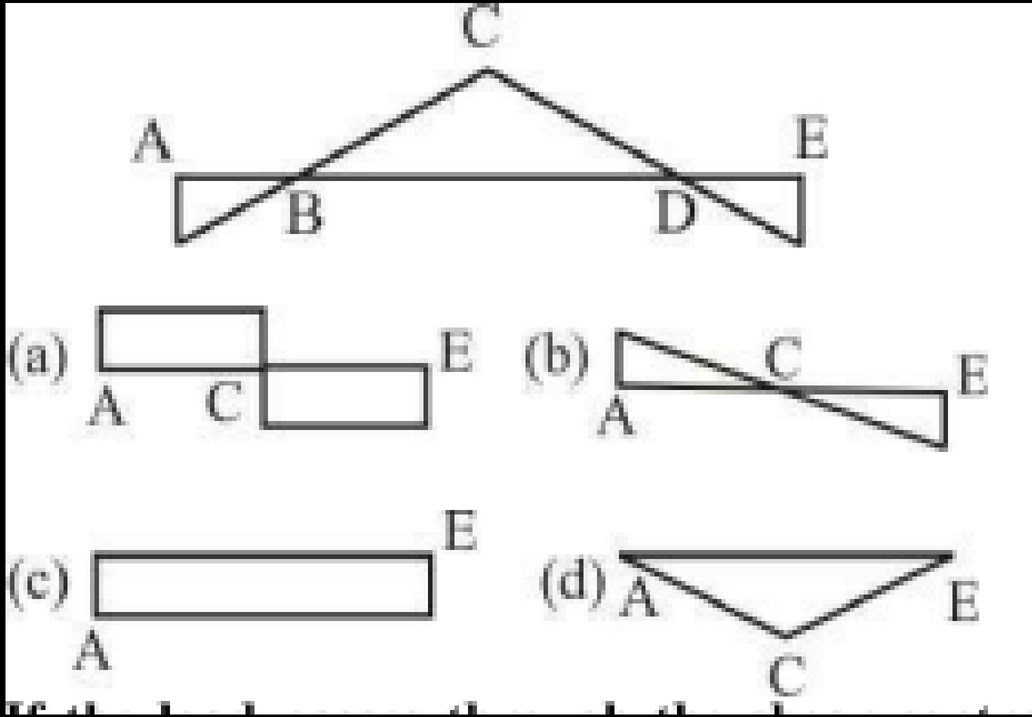
A : - M

B : +M

C : $\frac{+M}{2}$

D : $\frac{-M}{2}$

Q :) Bending moment distribution in a built beam is shown in the figure below. The shear force distribution in the beam is represented by:



Q :) If the load passes through the shear centre of the section of the beam, then there will be

A : Only bending in the beam

B : Only twisting in the beam

C : Bending accompanied by twisting

D : No bending in the beam

Q :) The maximum tension in a cable occurs

A : At the highest point in the cable

B : At the lowest point in the cable

C : At the centre of the cable

D : At all in the cable

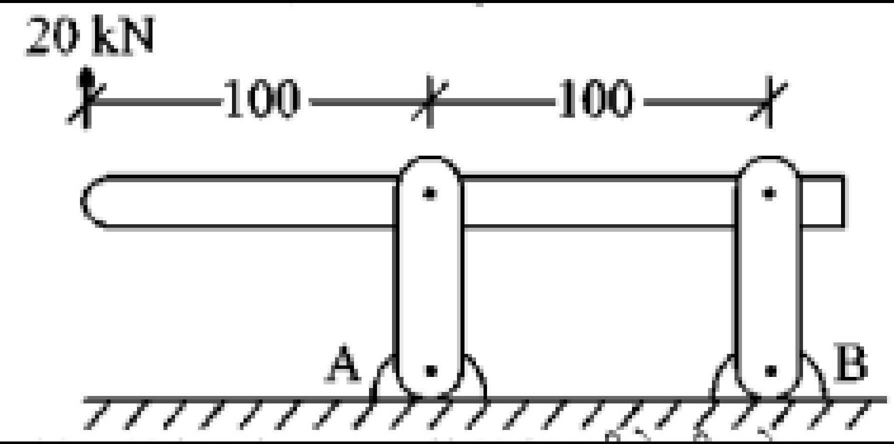
Q :) Reaction at support A is:

A : 40 kN downward

B : 40 KN upward

C : 20 kN upward

D : 20 kN downward



Q :) The bending moment in a cable carrying a system of loads will be

A : Maximum at the centre

B : Minimum at the centre

C : Zero at all points

D : None of the above

Q :) The stiffness of propped cantilever is equal to:

A : $\frac{3EI}{\ell}$

B : $\frac{EI}{2\ell}$

C : $\frac{4EI}{\ell}$

D : $\frac{2EI}{\ell}$

Q :) The shear force at a section in the conjugate beam corresponds to

A : Shear force multiplied by EI at that section in real beam

B : Deflection at that section multiplied by EI in real bema

C : EI times slope at that section in real beam

D : Slope at that section in real beam

Q :) Shear span is defined as the zone where:

A : Bending moment is zero

B : Shear force is zero

C : Shear force is constant

D : Bending moment is constant

Q :) A simply supported beam carries two equal concentrated loads ‘W’ at distances $\frac{L}{3}$ from either supports. The maximum bending moment ‘M’ is:

A : $\frac{WL}{3}$

B : $\frac{WL}{4}$

C : $\frac{WL}{8}$

D : $\frac{WL}{12}$

Q :) A cantilever beam is subjected to a concentration loads, W at the free end and is propped at the free end to the same level as that of the fixed support. The reaction in the prop (rigid) will be

A : $\frac{W}{2}$

B : 2

C : 2W

D : $\frac{3}{8}$W

Q :) For a conjugate beam, the fixed end of a real beam corresponds to

A : Fixed end

B : Free end

C : Hinged end

D : Hinged end on rollers

Q :) The point of contraflexure is the point where:

A : Bending moment changes sign

B : Bending moment is maximum

C : Bending moment is minimum

D : Shear force is zero

Q :) A support over which the real beam is continuous will correspond to

A : An internal hinge in the conjugate beam

B : A hinged support in the conjugate beam

C : A fixed support in the conjugate beam

D : A discontinuity in the conjugate beam

Q :) The ratio of load carrying capacity of a fixed beam to that of a simply supported beam having same maximum bending moment under u.d.l. throughout the span is

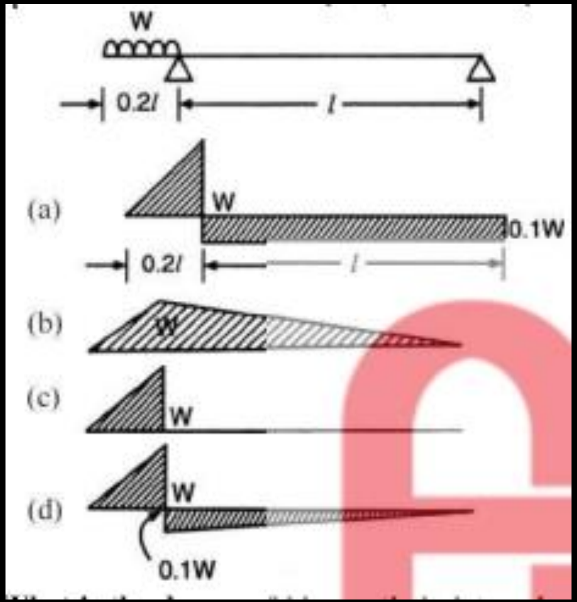
A : 1.5

B : 1.0

C : 0.6667

D : 3.0

Q :) The given figure shows a beam cantilevering out at one end. It carries a uniformly distributed load W over the cantilever. Which one of the given figures correctly represents the shear force diagram for the beam?



Q :) A bending moment causing concavity upward will be taken as _________ and called _________ bending moment.

A : Positive, sagging

B : Positive, hogging

C : Negative, sagging

D : Negative, hogging

Q :) The shear-force and bending moment are always positive in case of:

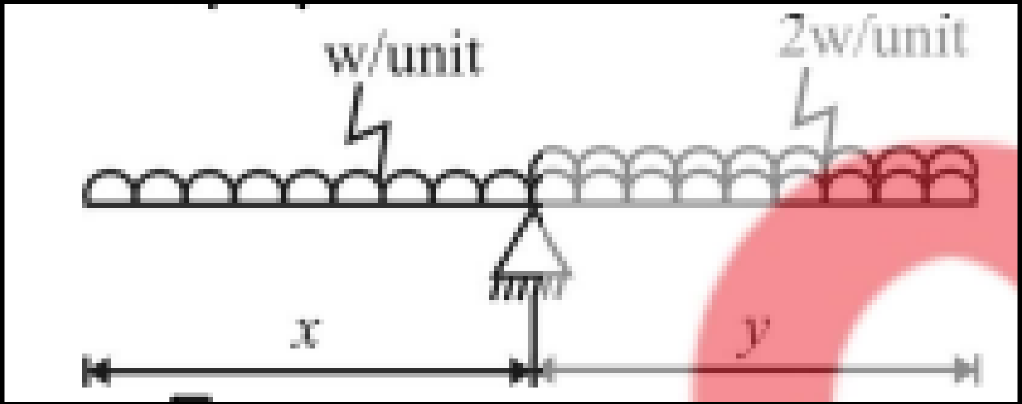
A : Cantilevers

B : Simply supported beams

C : Overhanging beams

D : None of these

Q :) In the given figure below beam will be stable when-



A : $\sqrt{2}x$ = y

B : 2 x = y

C : x = 2 y

D : x = $\sqrt{2}$ y

Q :) In a beam there is a layer which is neither stretched nor compressed during bending operations. This layer is known as-

A : Compressive layer

B : Tensile layer

C : Neutral layer

D : The middle layer

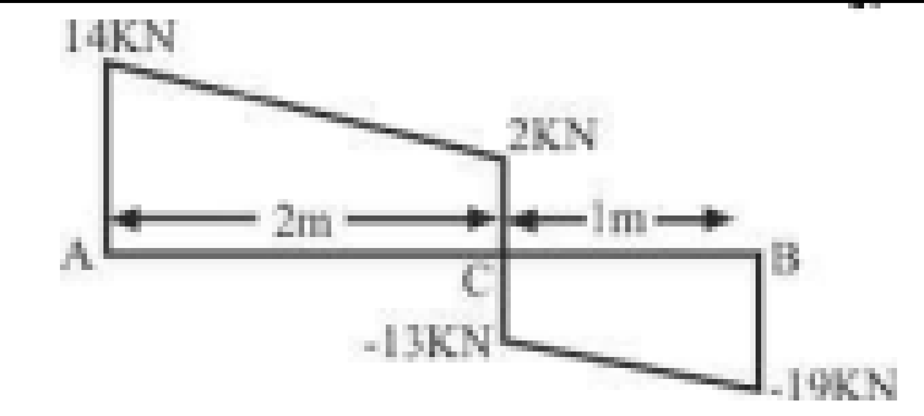
Q :) The shear force diagram of a loaded beam is shown in the following figure. The maximum bending moment of the beam is-

A : 16 kN-m

B : 11 kN-m

C : 28 kN-m

D : 8 kN-m



Q :) A beam of length (l + 2a) has supports ‘l’ aparts with an overhang ‘a’ on each side. The beam carries a concentrated load ‘W’ at each end. The shear force between the two supports is given by

A : Zero

B : 5W

C : W

D : 2W

Q :) A propped cantilever beam is propped at the free end. It is loaded with a uniformly distributed load of w per m. How many points of contraflexure would be formed in its bending moment diagram?

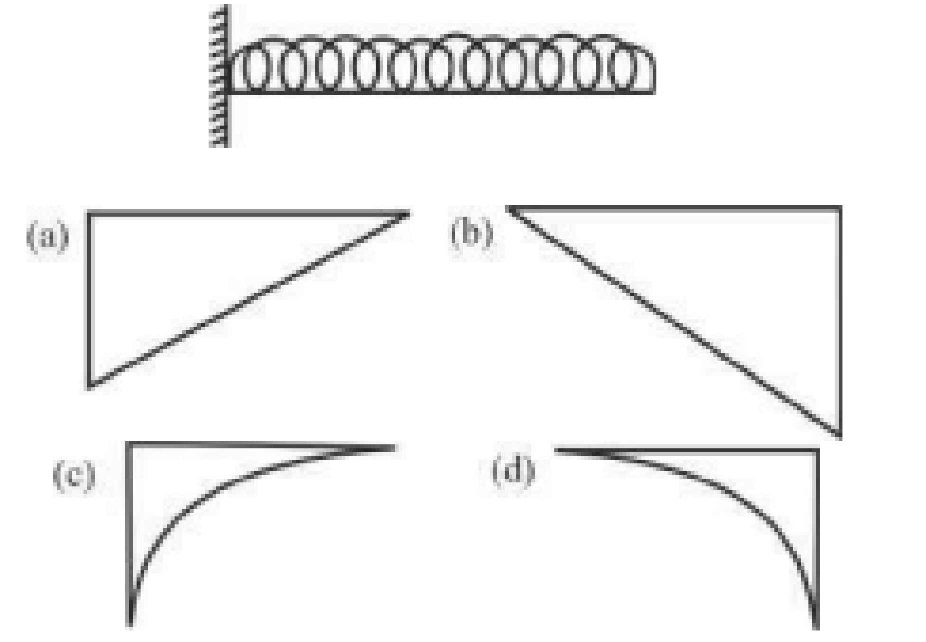
A : One

B : Two

C : None

D : Three

Q :) A cantilever carrying a uniformly distributed load as shown in Fig. Select the correct B.M. diagram of the cantilever beam.



Q :) A beam of length L is pinned at both ends and is subjected to a concentrated bending couple of moment M at its centre, the maximum bending moment in the beam is

A : M

B : M/2

C : M/3

D : ML/2

Q :) In as imply supported beam, along the neutral axis-

A : Fibres do not undergo strain

B : Fibres get twisted

C : Fibres undergo maximum strain

D : Fibres undergo minimum strain

Q :) A rectangular log of wood is floating in water with a load of 100 N at its centre. The maximum shear force in the wooden log is

A : 50 N at each end

B : 50 N at the centre

C : 100 N at the centre

D : Zero shear all through

Q :) Pick up the correct statement from the following-

A : For a uniformly distributed load, the shear force varies linearly

B : For a uniformly distributed load bending moment curve is a parabola

C : For a load varying linearly, the shear force curve is a parabola

D : All options are correct

Q :) If a beam simply supported at its two ends is loaded by a point load at the middle of the span, the maximum bending moment is M. If the same, load is equally distributed all over the span of another beam. Maximum bending moment in this beam will be-

A : M/2

B : M

C : M/3

D : M/4

Q :) A beam is supported over three rollers laying in the same plane. The beam is stable

A : For any general loading

B : For loading with no component in the direction of the beam

C : For loading with no component perpendicular to the direction of beam

D : Only when no load except self weight acts.

Q :) A cantilever beam of a span L, is subjected a moment P, at its free end. The bending moment induced at its support will be:

A : P/4

B : P/3

C : P/2

D : P

Q :) The number of points of contraflexure in a simply supported beam carrying uniformly distributed load, is-

A : 1

B : 2

C : 3

D : 0

Q :) The shape of cable under uniformly distributed horizontal load is-

A : Parabolic

B : Catenary

C : Circular

D : riangular

Q :) A beam of overall length l, with equal overhangs on both sides, carries a uniformly distributed load over the entire length. To have numerically equal bending moments at the centre of the beam and its supports, the distance between the supports should be

A : 0.207 l

B : 0.403 l

C : 0.586 l

D : 0.707 l

Q :) A bending moment may be defined as:

A : Arithmetic sum of the moments of all the forces on either side of the section

B : Arithmetic sum of the forces on either side of the section

C : Algebraic sum of the moments of all the forces on either side of the section

D : None of these

Q :) In a simply supported beam of length 5 m. A unit moment in kN-m is applied at both ends in opposite direction. The magnitude of bending moment at centre will be

A : Zero

B : 0.5 KN-m

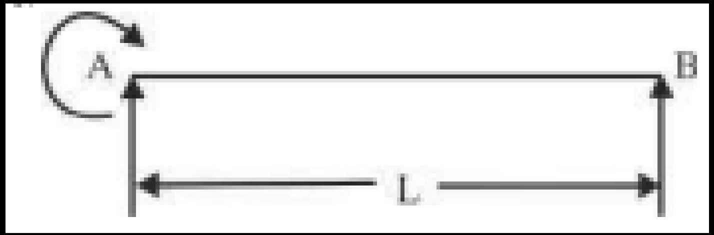
C : 1.0 kN-m

D : 2.0 kN-m

Q :) The B.M. diagram of the beam shown in below figure, is-

A : A rectangle

B : A triangle



C : A trapezium

D : A parabola

Q :) Pick up the correct statement from the following

A : The rate of change of bending moment is equal to rate of shear force

B : The rate of change of shear force is equal to rate of loading

C : Neither (a) nor (b)

D : Both (a) and (b)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