Q:) A single angle is connected by one leg only, If the area of outstanding leg is x, net area of connecting leg is y and k is reduction factor whose value is less than 1, then the net effective area of angle in tension will be:

A : x + y

B : x + ky

C : y + kx

D : k (x + y)

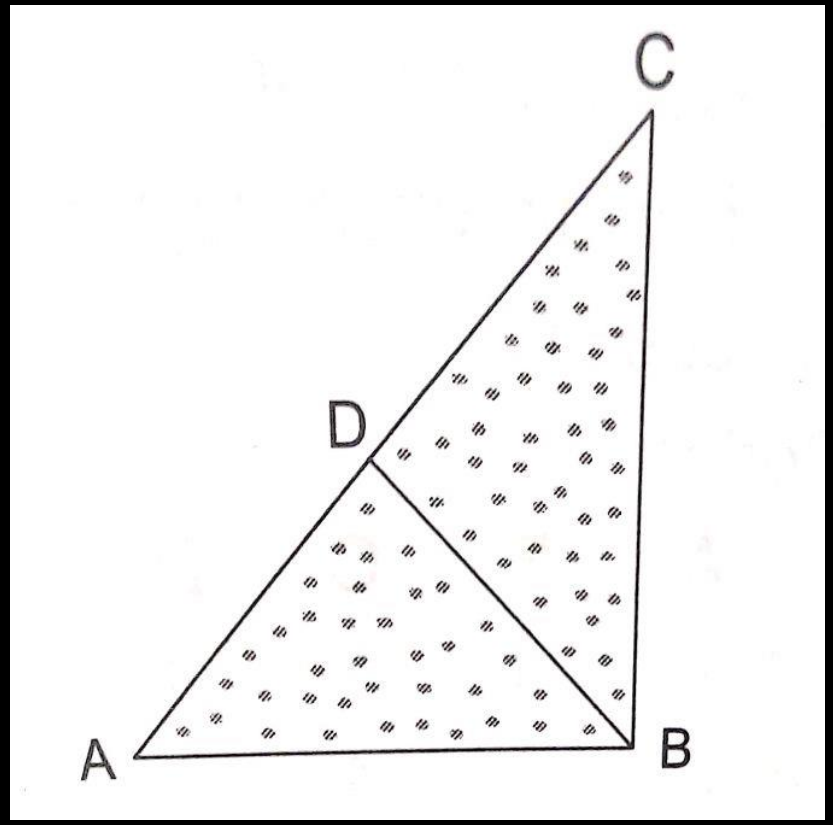
Q:) For the fillet weld cross-section shown in figure the throat thickness is:

A : AB

B : BC

C : AD

D : BD



Q:) In a fully developed rough-turbulent regime in pipe flow:

A : Rough and smooth pipes have the same friction factor

B : The laminar sublayer is thicker than the roughness projections

C : The friction factor is independent of the Reynolds number

D : The friction factor is independent of the relative roughness

Q:) A penstock is 3000 meters long. Pressure wave travels in it with a velocity of 1500 m/s. If the turbine gates are closed uniformly and completely in a period of 4.5 seconds, then it is called:

A : Rapid closure

B : Slow closure

C : Sudden closure

D : Uiform closure

Q:) For a triangular channel having a vertex angle of 120^{o}, the critical depth for a discharge of 3.0 m^3/s would be:

A : 0.906 m

B : 1.982 m

C : 1.019 m

D : 2,352 m

Q:) Match List-I (Typical occurrence) with List-II (Relevant flow condition) and select the correct answer using the codes given below the lists:

List-I (Typical occurrrence)	List-II (Relevant flow condition)
A.Cavitation	**1.**Absence of fluid velocity
B.Separation	**2.**Fluid pressure reduces to vapour pressure
C.Stangnation point	**3.**Bluff body in flow
D.Wake	**4.**Adverse pressure gradient in widening Boundaries of flow

Codes:

A : A-4, B-2, C-3, D-1

B : A-2, B-4, C-3, D-1

C : A-4, B-2, C-1, D-3

D : A-2, B-4, C-1, D-3

Q:) When two identical centrifugal pumps are operating in series on a common rising main, then?

A : Then pressure in the rising main will be nearly doubled, while discharge will remains same

B : The discharge will be nearly doubled while the pressure remains the same

C : Discharge as well as the pressure in the rising main will be doubled

D : Discharges well as the pressure in the rising main will increase hut not become double

Q:) An aquifer confined at top and bottom by impermeable layers is stratified into three layers as follows:

Layer	Thickness (m)	Permeability (m/day)
Top layer	4	30
Middle layer	2	10
Bottom layer	6	20

The transmissivity (m^2/day) of the aquifer is:

A : 260

B : 227

C : 80

D : 23

Q:) Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I	List-II
A. Evaporatranspiration	**1.**Penman method
B. Infiltration	**2.** Snyder's method
C. Synthetic unit hydrogrph	**3.** Muskingum method
D.Channel Routing	**4.**Horton's method

Codes:

A : A-1, B-4, C-2, D-3

B : A-3, B-4, C-1, D-2

C : A-1, B-2, C-4, D-3

D : A-2, B-4, C-3, D-1

Q:) A watershed is charged from rural to urban category over a period of time due to development process. The effect of urbanization on storm run-off hydrograph of such watershed:

A : Decreases the volume of run-off

B : Increases the time to peak discharge

C : Decrease the time base

D : Decreases the peak discharge

Q:) The correct sequence, in the direction of the flow of water for installation of a hydropower plant is:

A : Reservoir, surge tank, turbine, penstock

B : Reservoir, surge tank, penstock, turbine

C : Reservoir, penstock, turbine, surge tank

D : Reservoir, penstock, surge tank, turbine

Q:) As per IS 800-2007, the buckling class for hot-rolled tubular sections is

A : A

B : B

C : C

D : D

Q:) The variation of BM in the portion of a beam carrying uniformly varying load is

A : Constant

B : Linear

C : Parabola

D : Cubic parabola

Q:) If E is Young's modulus and I is moment of inertia, then the expression $EI\frac{d^3y}{dx^3}$ at any section for a beam is equal to

A : Load intensity at the section

B : Shear force at the section

C : Bending moment at the section

D : Slope at the section

Q:) In plastic analysis, the shape factor for a triangular section is

A : 1.5

B : 2.34

C : 1.7

D : 2.5

Q:) The influence line diagram for reaction at a support of a simply supported beam is

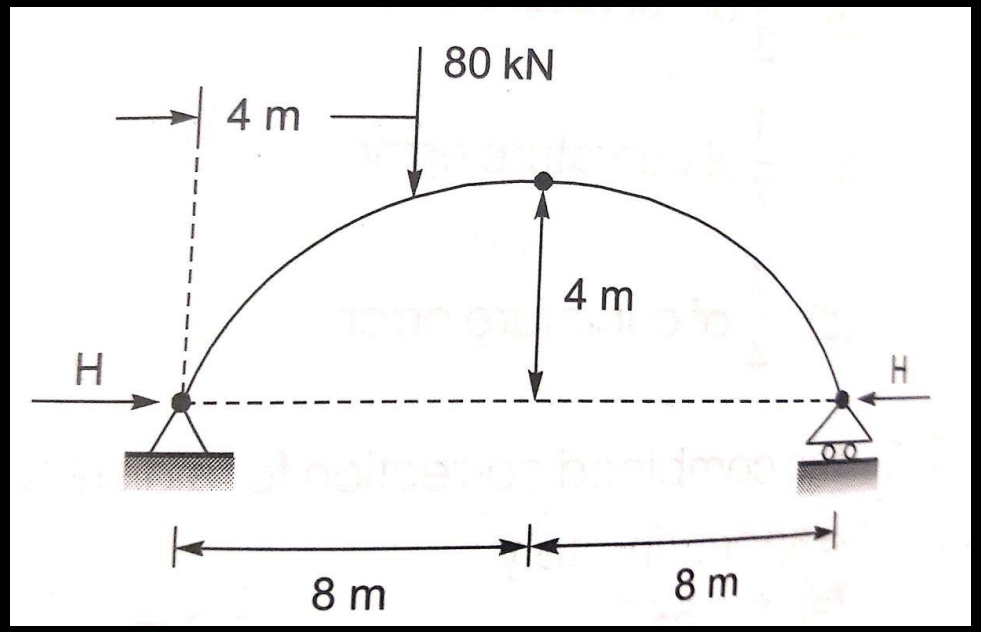
A : Triangle with ordinate 1 at that support

B : A triangle with ordinate 1 at the other support

C : A rectangle with ordinal of 1

D : A rectangle with ordinate of 1/2

Q:) The three hinged arch shown in figure will have the Horizontal Thrust (H) of



A : 20 kN

B : 30 kN

C : 40 kN

D : 50 kN

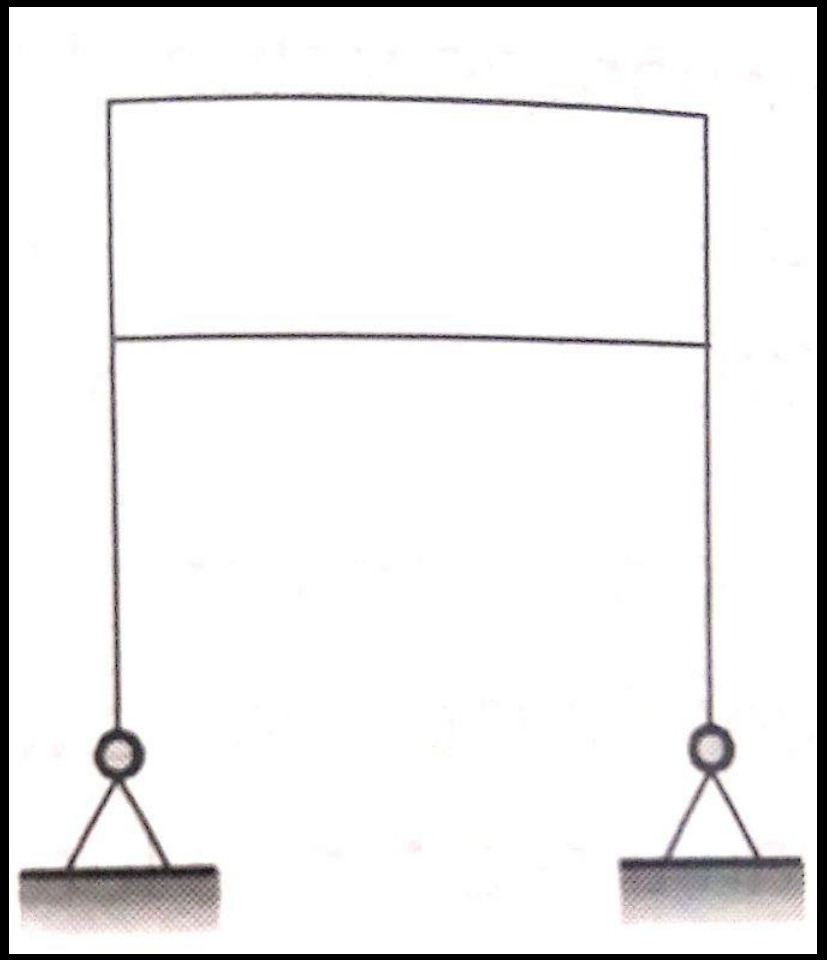
Q:) What is the degree of Kinematic indeterminacy of the frame shown in figure? Neglect axial deformation.

A : 14

B : 12

C : 10

D : 8



Q:) If the diameter of a reinforcement bar is "d", the anchorage value U-type of hook is

A : 4d

B : 8d

C : 12d

D : 16d

Q:) A lug angle

A : Increases the joint length and shear lag

B : Increase the shear lag

C : Reduces the joint length and shear lag

D : Reduces only the shear lag

Q:) In the pretensioning system, the restress is impacted to concrete by

A : Compression

B : The bound between steel and concrete

C : Tension

D : Bearing

Q:) Surface tension is due to cohesion between liquid particles at the surface, where as _____ is due to both cohesion and adhesion.

A : Viscosity

B : Capillarity

C : Vapor pressure

D : Elasticity

Q:) Which notch is preferred for measuring the low discharge?

A : Triangular notch

B : Rectangular notch

C : Trapezoidal notch

D : Parabolic notch

Q:) Motion of rotating mass of fluid is known as

A : Vortex motion

B : Steady motion

C : Spiral motion

D : Radial motion

Q:) In a singly reinforced beam, the effective depth is measured from its compression edge to

A : Tensile edge

B : Tensile reinforcement

C : Neutral axis of the beam

D : Longitudianl central axis

Q:) Web crippling generally occurs at the point where

A : Bending moment is maximum

B : Shearing force is minimum

C : Heavy concentrated loads act

D : Deflection is maximum

Q:) The minimum pitch for bolts as per IS:800-2007 is

A : 2.5 d

B : 3 d

C : 3.5 d

D : 4 d

Q:) Gauge of the bolt is the distance between two consecutive bolts in

A : The direction perpendicular to the direction of load/stress

B : The direction of load/stress

C : The direction at 45° to the line of action of force

D : An inclined direction

Q:) A simply supported pre-stressed concrete beam is expected too carry uniformly distributed load. The tendons should preferably be

A : A circular profile with convexity upward

B : A straight profile below the centroid axis

C : A parabolic profile with convexity downward

D : A straight profile along the centroid axis

Q:) The decrease of stress in steel at constant strain is termed as

A : Creep

B : Fatigue limit

C : Relaxation

D : Endurance limit

Q:) _____ equation derived above the velocity head or the kinetic energy per unit weight of the fluid.

A : Euler's

B : Bernoulli's

C : Viscosity

D : Velocity

Q:) Manning's formula is used for the analysis of the problems of

A : Flow through channels

B : Flow through pipes

C : Head loss due to friction in channel

D : Head loss due to friction in pipe

Q:) In case of gravity dam of base width 'b', If the resultant passes with an eccentricity b/6, what will be ratio of maximum compression stress and maximum tensile stress:

A : ∞

B : 0

C : 1

D : 6

Q:) If the Froude number of a hydraulic jump is more than 9, this jump is classified as:

A : Weak jump

B : Strong jump

C : Oscillating jump

D : None of these

Q:) In a confined aquifer, one of the following condition occurs:

A : Water surface under the ground is at atmospheric pressure

B : Water table serves as upper surface of zone of saturations

C : Water is under pressure between two impervious strata

D : None of these

Q:) A rectangular open channel carries a discharge of 15 cumecs at depth of flow as 1.5 m and bed slope as 1:1440. If only slope is changed to 1:1000 with same depth of flow, discharge will be:

A : 21.6 cumecs

B : 18.0 cumecs

C : 14.4 cumecs

D : 12.5 cumecs

Q:) For a uniform flow with depth of 0.6 m and Froude number of 2.0 in a rectangular channel, the specific energy will be:

A : 0.8 m

B : 2.6 m

C : 4.8 m

D : 1.8 m

Q:) In a horizontal rectangular channel, the conjugate depths of flow before and after the hydraulic jump are observed as 0.25 m and 1.25 m, the energy loss due to jump will be:

A : 0.8

B : 1

C : 1.25

D : 1.5

Q:) As per Is code, the minimum grade of concrete for the design of restressed concrete structure is:

A : M20

B : m25

C : M15

D : M30

Q:) For the purpose of the design of reinforced concrete footings, pressure distribution is assumed to be:

A : Parabolic

B : Linear

C : Hyperbolic

D : None of the above

Q:) In a R.C. column, the spacing of longitudinal bars measured along the periphery of column should not exceed:

A : 250 mm

B : 200 mm

C : 350 mm

D : 300 mm

Q:) The value of limiting moment of resistance of a RC beam for M25 grade of concrete and Fe500 grade of steel is given by (Notations have their usual meaning):

A : 3.33 bd^2

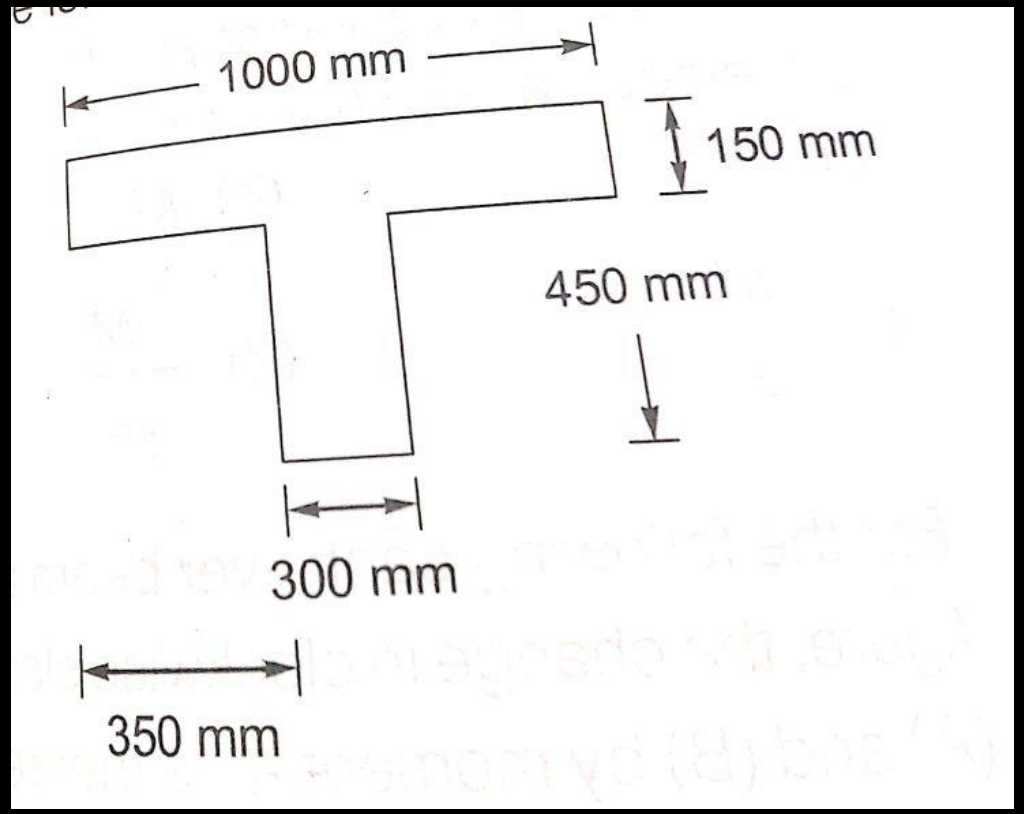
B : 3.38 bd^2

C : 3.35 bd^2

D : 3.44 bd^2

Q:) An isolated 'T' beam is used on walkway. The beam is simply supported with an effective span of 6 m. Effective width of flange for shown figure is:

A : 1000 mm
B : 1100 mm
C : 1260 mm
D : 2200 mm



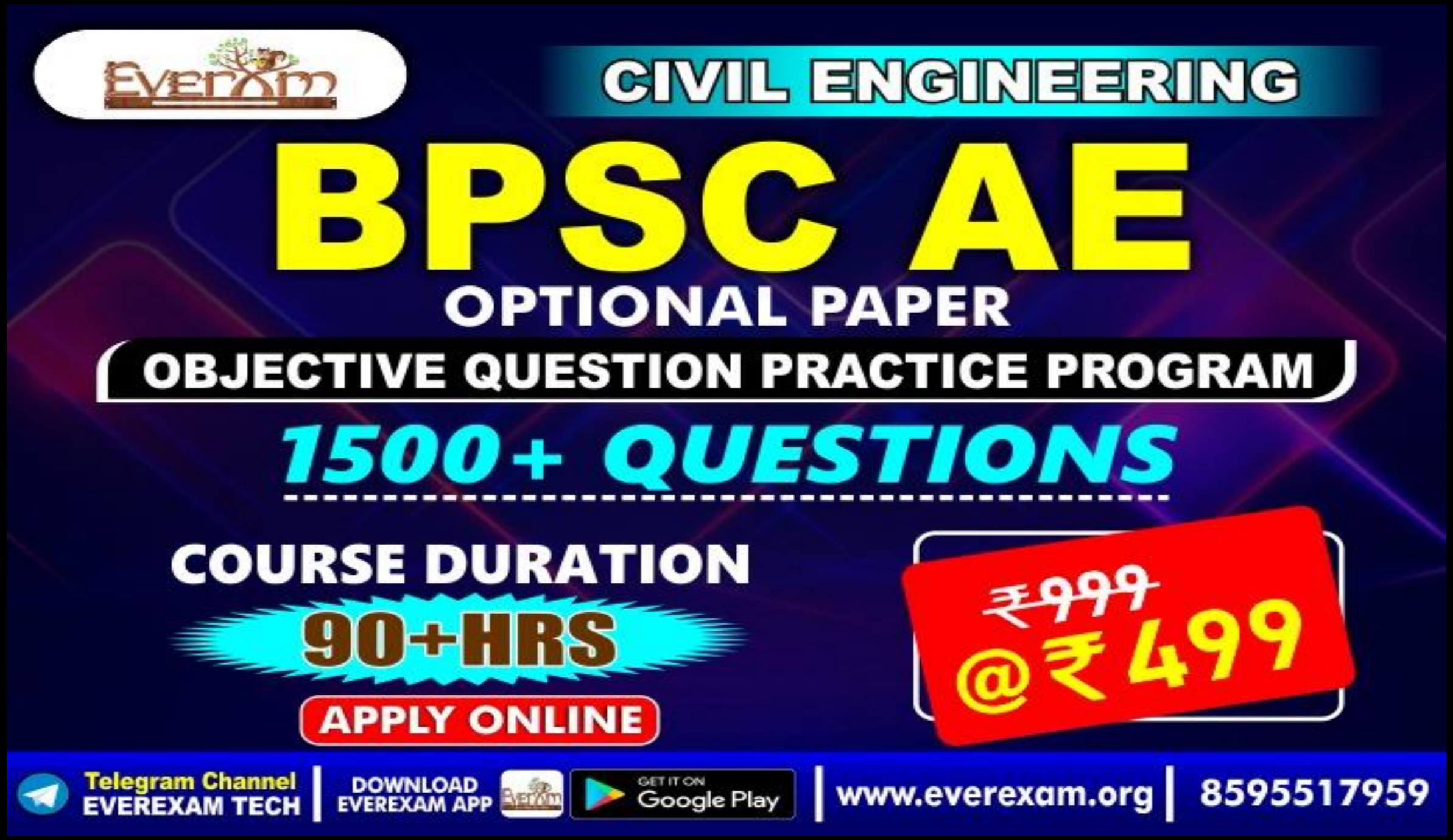
Q:) In a doubly reinforced concrete beam, if d' is the effective cover to compression reinforcement, x_m is depth of neutral axis, the strain at the level of compression reinforcement is given by:

A : $e_c = 0.00035\left(1 - \frac{d'}{x_m}\right)$

B : $e_c = 0.0035\left(1 - \frac{d'}{x_m}\right)$

C : $e_c = 0.002\left(1 - \frac{d'}{x_m}\right)$

D : $e_c = 0.0035\left(2 - \frac{d'}{x_m}\right)$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