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Q:) The relationship between the capital recovery factor and sinking fund factor in a uniform series of payments is given by

A : Capital recovery factor = Sinking fund factor - Interest rate

B : Capital recovery factor = Sinking fund factor - $(\text{Interest rate})^2$

C : Capital recovery factor = Sinking fund factor + $(\text{Interest rate})^2$

D : Capital recovery factor = Sinking fund factor + Interest rate

Q:) Which of the following is true in case of railway track maintenance?

A : Claw bar is used to correct track alignment while crow bar is used to remove dog spikes

B : Crow bar is used to correct track alignment while claw bar is used to remove dog spikes

C : Only claw bar can be used to correct track alignment and remove dog spikes

D : Only crow bar can be used to correct track alignment and remove dog spikes

Q:) Choice of gauge depends on

A : Volume of traffic only

B : Speed of train only

C : Neither (volume of traffic) nor (speed of train)

D : Both (volume of traffic) and (speed of train)

Q:) As per ICAO, for A and B type of airports, maximum effective grade is

A : 0.0175

B : 0.015

C : 0.0125

D : 0.01

Q:) The flow-mass curve is graphical representation of

A : Cumulative discharge and time

B : Discharge and percentage probability of flow being equaled or exceeded

C : Cumulative discharge, volume and time in chronological order

D : Discharge and time in chronological order

Q:) For a catchment area of 120 km^2, the equilibrium discharge in m^3/hour of an S-curve obtained by the summation of 6 hour unit hydrograph is

A : 0.2×10^6

B : 0.6×10^6

C : 2.4×10^6

D : 7.2×10^6

Q:) In India, which of the following is adopted as standard recording rain gauge?

A : Symon's rain gauge

B : Tipping bucket type

C : Syphon type

D : Weighing bucket type

Q:) The maximum average depth due to one day storm over an area of 100 km^2 is 100 mm. Depth-Area-Duration (DAD) curves indicates that for the same area of 100 km^2 the maximum average depth for a 3 hour storm will be

A : 100 mm

B : More than 100 mm

C : Less than 100 mm

D : None of these are correct

Q:) The most suitable chemical which can be applied to the water surface for reducing evaporation is

A : Methyl alcohol

B : Ethyl alcohol

C : Acetyl alcohol

D : Butyl alcohol

Q:) The discharge passing over an ogee spillway is given by (where, L is effective length of spillway crest and H is the total head over the spillway crest including velocity head).

A : $CLH^{3/2}$

B : $CLL^{3/2}$

C : $CLH^{5/2}$

D : $CLH^{1/2}$

Q:) Which of the following methods is used to estimate flood discharge based on high water marks left over in the past?

A : Slope-area method

B : Area-velocity method

C : Moving boat method

D : Ultra-sonic method

Q:) If the Froude number of a hydraulic jump is 5.50, it can be classified as

A : An oscillating jump

B : A weak jump

C : A strong jump

D : A steady jump

Q:) Which of the following is not the displacement method?

A : Equilibrium method

B : Column analogy method

C : Moment distribution method

D : Kani's method

Q:) When a uniformly distributed load, shorter than the span of the girder, moves from left to right, then the conditions for maximum bending moment at a section is that

A : The head of the load reaches the section.

B : The tail of the load reaches the section.

C : The load position should be such that the section divides it equally on both side.

D : The load position should be such that the section divides the load in the same ratio as it divides the span

Q:) In column analogy method, the area of an analogous column for a fixed beam of span L and flexural rigidity EI is taken as

A : L/EI

B : L/2EI

C : L/4EI

D : L/8EI

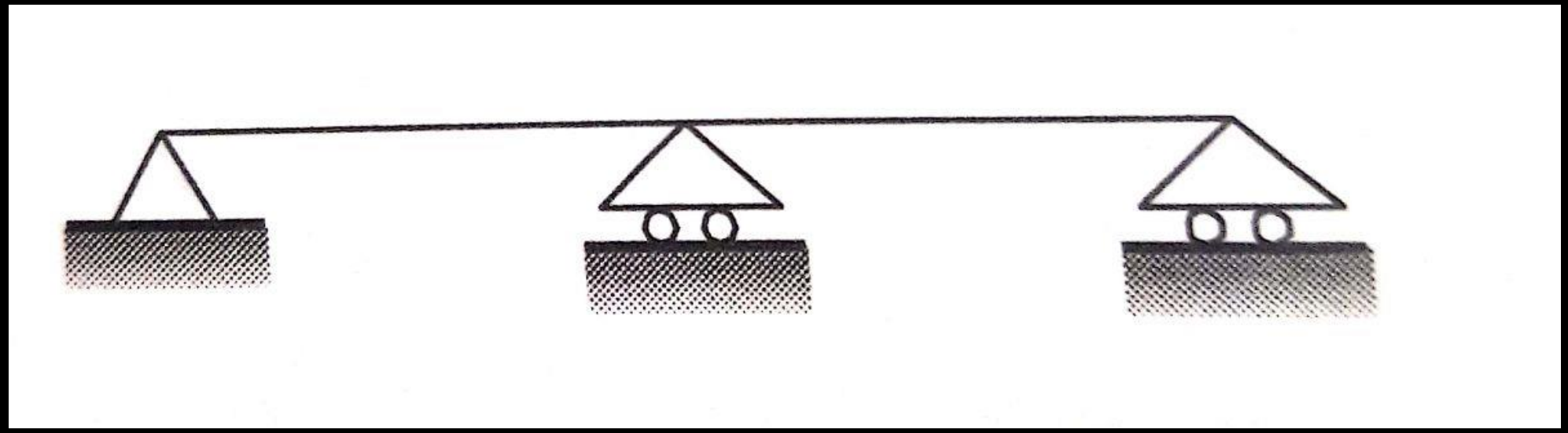
Q:) What is the degree of kinematic indeterminacy of the beam shown in figure above

A : 2

B : 3

C : 5

D : 9



Q:) If all the dimensions of a prismatic bar are increases in the proportion η:1, the proportion with which the maximum stress produced in the bar by its own weight will change by

A : 1:η^2

B : 1:η

C : $\sqrt{\eta}$**:1**

D : η:1

Q:) In limit state design, under - reinforced section is one in which

A : Tensile strain in steel reaches yield value while maximum compressive strain in concrete is less than its ultimate crushing strain.

B : Maximum tensile stress in steel reaches its permissible value while maximum compressive stress in concrete is less than its permissible value.

C : Maximum compressive strain in concrete reaches the ultimate crushing value while tensile strain in steel is less than its yield value.

D : Maximum compressive strain in concrete reaches its permissible value while tensile strain in steel is less than its permissible value.

Q:) Match List-A with List-B and select the correct answer using the codes given below the list:

List-I	List-II
A. Minimum cover	**1.** Ultimate movement capacity
B. Span to depth ratio	**2.** Durability
C. Limit state ratio	**3.** Serviceability
D. Doubly reinforced section	**4.** Reduction in sectional depth

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

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

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

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

Q:) Those loss of restress due to shrinkage of concrete is the product of

A : Modular ratio and percentage of steel

B : Modulus of elasticity of concrete and shrinkage of concrete

C : Modulus of elasticity of steel and shrinkage of concrete

D : Modular ratio and modulus of elasticity of steel.

Q:) Restressed concrete is more desirable in case of

A : Cylindrical pipes subjected to internal fluid pressure

B : Cylindrical pipes subjected to external fluid pressure

C : Cylindrical pipes subjected to equal internal and external fluid pressures

D : Cylindrical pipes subjected to end pressures

Q:) The applicable IS code for RCC liquid retaining structure is

A : IS:456

B : IS:800

C : IS:1893

D : IS:3370

Q:) Drops in flat slabs are provided to resist

A : Bending moment

B : Thrust

C : Shear

D : Torsion

Q:) By providing sufficient edge distance, which of the following failures of riveted joint can be avoided

A : Tension failure of the plate

B : shear failure of the rivet

C : Shear failure of the plate

D : Crushing failure of the rivet

Q:) Gantry girders are designed to resist

A : Lateral loads

B : Longitudinal and vertical loads

C : Longitudinal, lateral and vertical loads

D : Longitudinal and lateral loads

Q:) Match List-i with List-II and select correct answer using the loads given below the list:

List-I (Types of stress)	List-II (Allowable value of stress)
A. Axial tension	1. $0.75 f_y$
B. Bending tension	2. $0.66 f_y$
C. Maximum shear stress	3. $0.60 f_y$
D. Bearing stress	4. $0.40 f_y$

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

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

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

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

Q:) In a composite construction

A : Interface slipping is prevented by using shear connector

B : Differential shrinkage is overcome by using the same grade of concrete for both the components

C : Precast member is always designed to carry the weight of in-situ concrete without props.

D : The in-situ concrete cannot be prestressed.

Q:) In PERT analysis, the time estimates of activities and probability of their occurrence follow

A : Normal distribution curve

B : Poisson's distribution curve

C : β-distribution curve

D : Binomial distribution curve

Q:) If the optimistic time, most likely time and pessimistic time or activity A are 4, 6 and 8 weeks. Respectively and for activity B are 5, 5.5 and 9 weeks respectively, then

A : Expected time of activity A is greater than the expected time of activity B

B : Expected time of activity B is greater than the expected time of activity A

C : Expected time of both activities A and B are same

D : Data too inadequate to compute expected time of activities

Q:) The reduction in project time normally results in

A : Decrease in the direct cost and increase in the indirect cost

B : Increase in the direct cost and decrease in the indirect cost

C : Increase in both direct and indirect costs

D : Decrease in both direct and indirect costs

Q:) With the usual notations, capital recovery factor is given by

A : $\left(\frac{i(1+i)^{\eta}}{(1+i)^{\eta}-1} \right)$

B : $\left(\frac{i}{(1+i)^{\eta}-1} \right)$

C : $\frac{i}{(1+i)^{\eta}}$

D : $(1+i)^{\eta}$

Q:) Which of the following is not the function of fastener?

A : To hold rails in proper positions

B : To join rail with sleepers

C : To join adjacent rails

D : To join sleeper with ballast

Q:) A plot between rainfall intensity vs time is known as

A : Isohyet

B : Hyetograph

C : Hydrograph

D : Mass curve

Q:) A reengage recorded hourly rainfall as 5 cm, 2 cm, 4 cm and 3 cm for a four hour storm respectively. If the ϕ index was 3 cm/hour, the total direct runoff from a catchment for the storm was

A : 14 cm

B : 12 cm

C : 3 cm

D : 2 cm

Q:) Hydrograph is a plot of

A : Rainfall intensity vs time

B : Cumulative rainfall vs time

C : Runoff depth vs time

D : Discharge vs time

Q:) A unit hydrograph has one unit of

A : Peak discharge

B : Rainfall duration

C : Direct runoff

D : Base time

Q:) If two 2-hour unit hydrograph are staggered by 2 hours and added graphically, the resulting hydrograph will be

A : 2-hour unit hydrograph

B : 4-hour unit hydrograph

C : 2-hour unit hydrograph with 2 cm runoff

D : 4-hour unit hydrograph with 2 cm runoff

Q:) The hydrograph flood routing uses

A : Continuity equation only

B : Momentum equation only

C : Both continuity and momentum equations

D : Energy equation only

Q:) Steady pumping of a well at 314 m^3/hour produces drawdowns 4.0 m and 2.0 m at radial distances 2.0 m and 20.0 m respectively in a confined aquifer. The transmissivity of the aquifer is about

A : 25.00 m^2/hour

B : 57.55 m^2/hour

C : 28.78 m^2/hour

D : 50.00 m^2/hour

Q:) Trap efficiency of a reservoir is a function of

A : Outflow/inflow ratio

B : Capacity/inflow ratio

C : Capacity/outflow ratio

D : All of these is correct

Q:) The method of measurement of concrete work specifies cubic content shall be worked out to the nearest

A : 0.1 m^3

B : 0.01 m^3

C : 0.001 m^3

D : 1.0 m^3

Q:) Excavation exceeding 1.5 m in width as well as 10 m^2 on plan but not exceeding 30 cm in depth shall be decreased as

A : Surface excavation

B : Surface dressing

C : Excavation in trenches

D : Cutting

Q:) In Mass Haul diagram (Mass diagram), the term haul represents the

A : Sum of the product of each load by its distance

B : Distance at any time from the working face of an excavation to the tip end of the embankment

C : Distance from the centre of gravity of a cutting to that of tipped material

D : Horizontal distance through which the load is shifted

Q:) Specification for corrugated galvanized iron roofing specifies that the roof slope shall not be laid flatter than _____ if not otherwise specially mentioned.

A : 1 in 1

B : 1 in 2

C : 1 in 3

D : 1 in 4

Q:) As per IS 1200, in the measurement of brickwork, no deductions shall be made for

A : Opening up to 0.1 sq. m in area

B : Opening up to 0.01 sq. m in area

C : Opening up to 0.001 sq. m in area

D : Opening up to 1.0 sq. m in area

Q:) If a bar is cranked at both ends at an angle of 30º, then the extra length required when compared to a straight bar is (D = centre to centre distance between the top and bottom steel.)

A : 2 × 0.72 D

B : 2 × 0.27 D

C : 2 × 0.42 D

D : 2 × 0.24 D

Q:) Degree of static indeterminacy of a rigid jointed plane frame having 15 members, 3 reaction components and 14 joints is

A : 2

B : 3

C : 6

D : 8

Q:) At a certain station, the mean of the average temperature is 30°C and mean of the maximum daily temperature is 45°C. What is the airport reference temperature?

A : 25°C

B : 35°C

C : 45°C

D : None of the above

Q:) Muller-Breslau Principle for influence line is applicable for

A : Continuous beams and frames

B : Portal frames

C : Fixed beam

D : All of the above

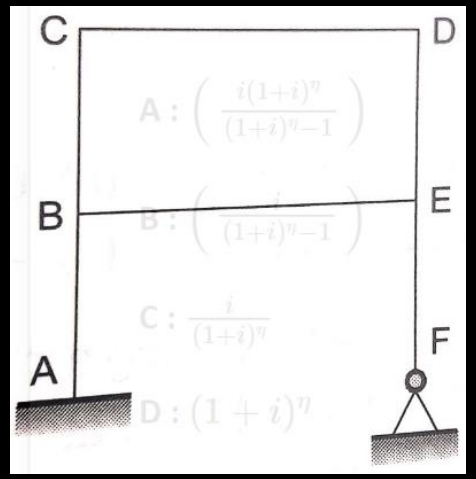
Q:) The degree of kinematic indeterminacy of a plane structure shown in the figure neglecting axial strain, is

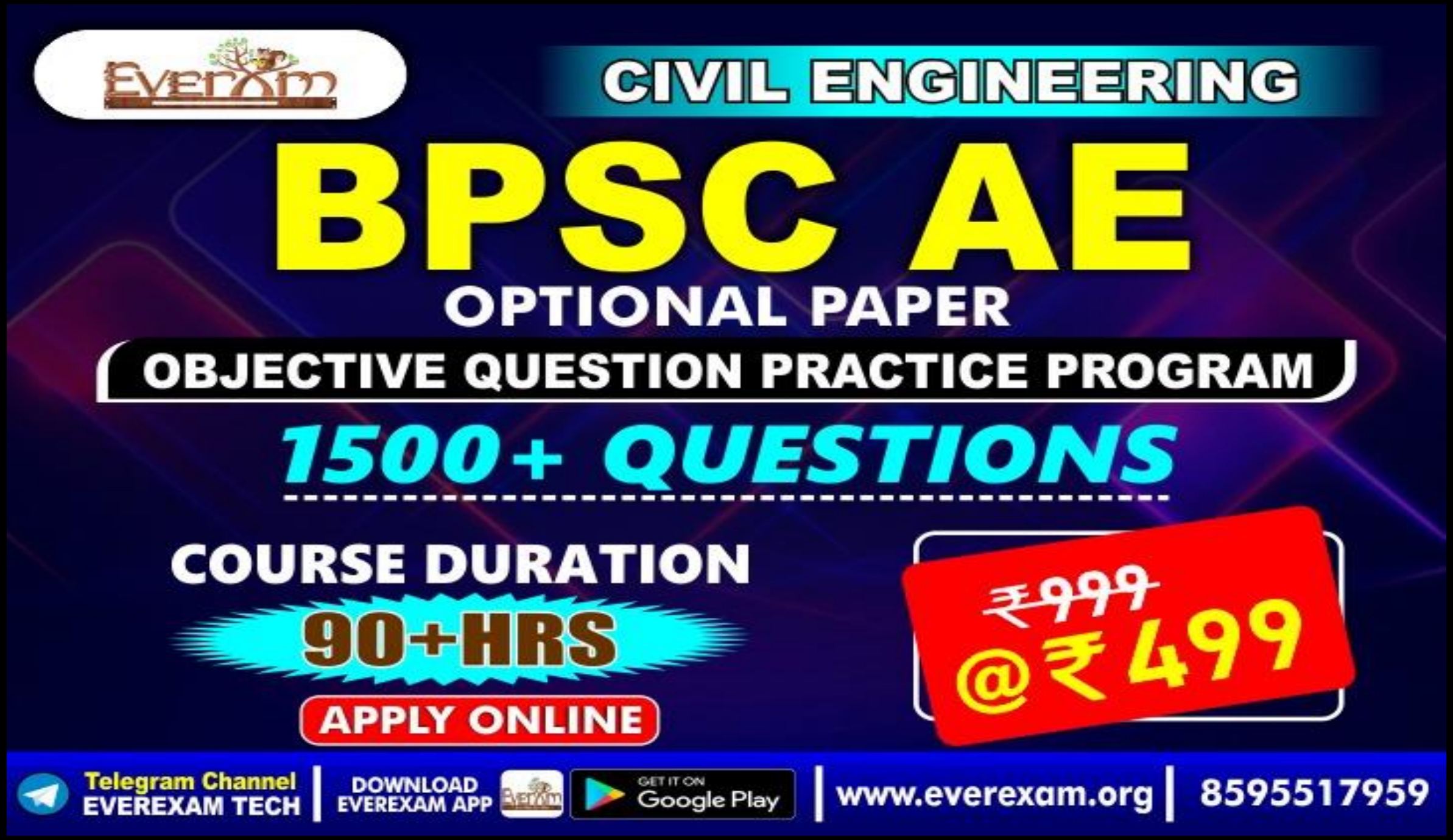
A : 4

B : 5

C : 6

D : 7

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