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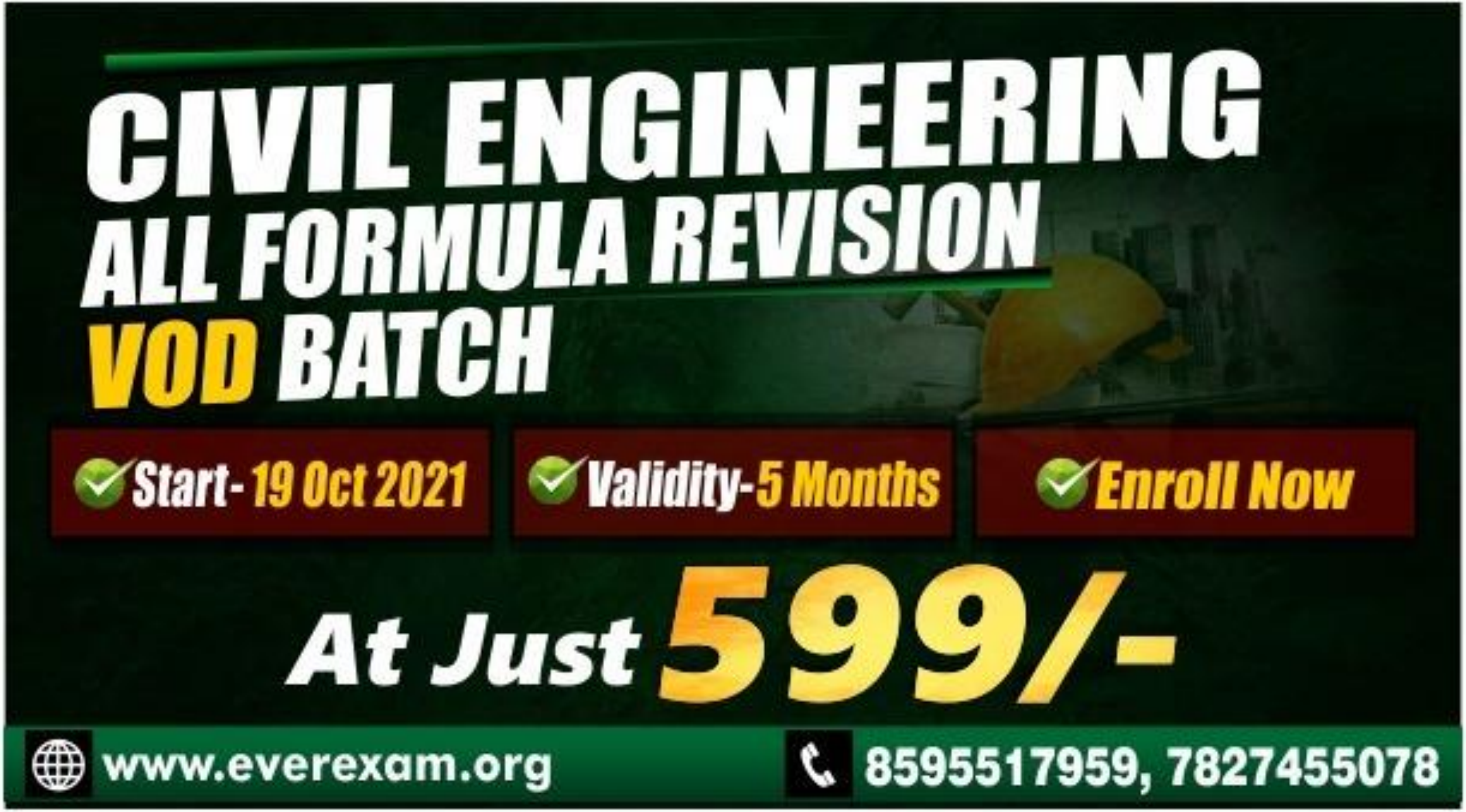
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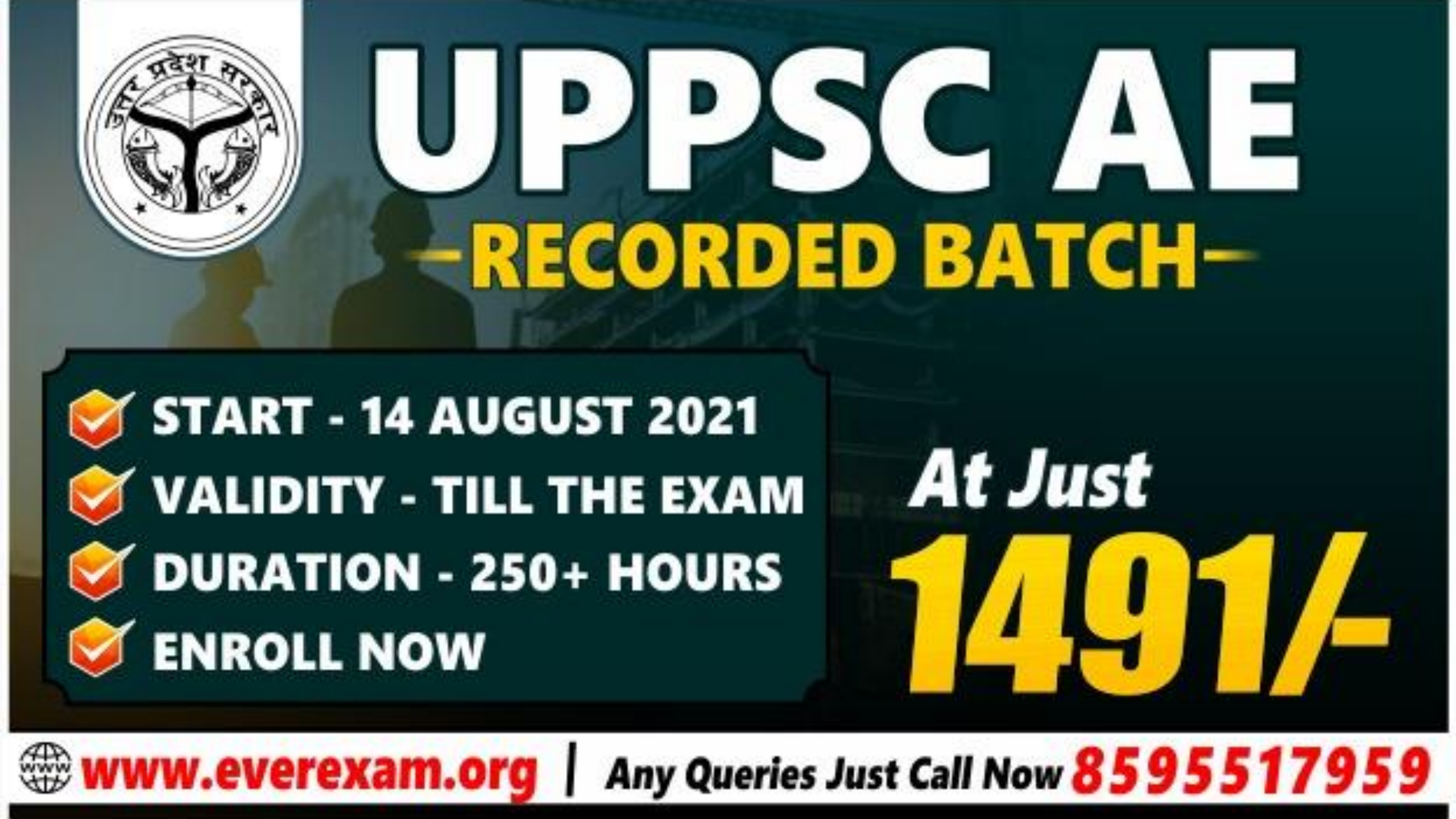
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Q :) The split tensile strength of M15 grade concrete when expressed as a percentage of its compressive strength is

A : 10 to 15%

B : 15 to 20%

C : 20 to 25%

D : 25 to 30%

Q :) Light weight concrete is used for

A : Air conditioned buildings

B : Non-load bearing walls

C : Reducing thickness of structures

D : Heat resistance

Q :) The development length of each bar of three bars bundled together is increased by:

A : 0.1

B : 0.2

C : 0.33

D : 0.5

Q :) According to the concept of limit state design as per IS 456:2000, the probability of failure of a structure is:

A : 0.097

B : 0.079

C : 0.067

D : 0.78

Q :) A bar is made of steel and it is 25 cm long. Its diameter is 5 mm. It is heated from 20°C to 50°C, while it is free to expand. The bar will develop

A : Tensile stress

B : No stress

C : Compressive stress

D : Shear stress

Q :) Loss of stress with time at constant strain in steel is called

A : Relaxation

B : Creep

C : Ductility

D : Shrinkage

Q :) Which of the following is NOT considered as dead load

A : Erection load

B : Self-weight of the floor slab

C : Self-weight of a beam

D : Self-weight of a column

Q :) The usual mix adopted for cement concrete for RCC pipes is

A : 1 : 4 : 8

B : 1 : 3 : 6

C : 1 : 2 : 4

D : 1 : 1.5 : 3

Q :) What is the maximum permissible acid soluble chloride content (kg/cum) for reinforced concrete?

A : 1.5

B : 0.6

C : 0.4

D : 3

Q :) Match the items in List 1 (Type of materials for repair of structures) with those in List 2 (Use/characteristics). Choose the best answer using the codes given in options.

List 1	List 2
A. Carbon fibre reinforced polymeric composite	1. Flowable, shrinkage free, high early strength concrete.
B. Fibre reinforced polymeric (FRP) composite	2. Repair of column
C. Micro concrete	3. Replacement of defective / corroded reinforcement
D. High performance concrete	4. Heavy duty floors with congested reinforcement
E. Carbon aramid meshes	

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

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

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

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

Q :) The anchorage value of a hook is assumed four times the diameter of the bar if the angle of the bend is:-

A : 60^o

B : 30^o

C : 45^o

D : 40^o

Q :) For RC braced frames maximum redistribution of moment allowed is

A : 30%

B : 40%

C : 20%

D : 10%

Q :) If q is the punching shear resistance per unit area a, is the side of a square footing for a column of side b, carrying a weight W including the weight of the footing, the depth (D) of the footing from punching shear consideration, is:

A : D = $\frac{W(a-b)}{4a^2bq}$

B : D = $\frac{W(a^2-b^2)}{4a^2bq}$

C : D = $\frac{W(a^2-b^2)}{8a^2bq}$

D : D = $\frac{W(a^2-b^2)}{4abq}$

Q :) Assertion (A) : In the case of mild steel, the tensile strength (expressed as per area) of smaller diameter bars are more than that of larger diameter bars.

Reason (R) : In case of smaller diameter mild steel bars, the ratio of outer hard core to total area (outer hard core + inner soft core) is more.

A : Both A and R are true and R is the correct explanation of A

B : Both A and R are true but R is not a correct explanation of A

C : A is true but R is false

D : A is false but R is true

Q :) The pin of a rocker bearing in a bridge is design for-

A : Bearing and shear

B : Bending and shear

C : Bearing and bending

D : Bearing, shear and bending

Q :) Loss of stress due to elastic deformation of concrete depends upon:

A : Relaxation of steel

B : Modular ratio

C : Friction and anchorage slip

D : Shrinkage strain

Q :) According to IS 456 : 2000, the dosages of retarders, plasticizer and super plasticizer by weight of cementations materials respectively are restricted to:

A : 0.5%, 0.5% and 1.0%

B : 0.5%, 1.0% and 2.0%

C : 1.0%, 0.5% and 2.0%

D : 1.1%, 0.5% and 2.0%

Q :) The sulphate content as SO_4 in water to be used for concreting should not exceed

A : 1000 mg/L

B : 750 mg/L

C : 500 mg/L

D : 1250 mg/L

Q :) Rebound hammer is used to determine to find

A : In-situ tensile strength

B : In-situ compressive strength

C : In-situ flexural strength

D : All of the above

Q :) The individual variation between test strength of sample should not be more than

A : ± 5% of average

B : ± 10% of average

C : ± 15% of average

D : ± 20% of average

Q :) The permissible bending compressive strength for M 25 grade of concrete is 8.5 N/mm^2. Its short-term and long-term modular ratio are, nearly

A : 8 and 11

B : 8 and 8

C : 11 and 11

D : 11 and 6

Q :) When a steel bar is subjected to tensile load, after yield point and large strain, the material undergoes its atomic and crystalline structure. This is named as

A : Strain hardener

B : Strain expansion

C : Strain shrinkage

D : Strain smoother

Q :) Under service loads the crack width in concrete should not exceed under mild exposure as per IS 456 is:

A : 0.1 mm

B : 0.3 mm

C : 0.2 mm

D : 0.4 mm

Q :) The maximum stress to which any member is designed is much less than the ultimate stress. This stress is called as:

A : Limit stress

B : Working stress

C : Nominal stress

D : True stress

Q :) A reinforced concrete beam is subjected to the following bending moments:

Moment due to Dead load = 40 KNm;

Moment due to live load = 60 kNm;

Moment due to seismic load = 20 kNm.

The design bending moment for limit state of collapse is:

A : 180 kNm

B : 150 kNm

C : 120 kNm

D : 144 kNm

Q :) Shear failure at sections of simply supported beams and cantilever beam without shear reinforcement will normally occur on plane inclined at an angle

A : 30 degree to the horizontal

B : 30 degree to the vertical

C : 45 degree to the horizontal

D : 25 degree to the vertical

Q :) A ready-mix concrete supplier supplied 101 cum of concrete for a slab. AS per the minimum sampling frequency, the number of cube samples required are

A : 5

B : 4

C : 6

D : 6

E : 3

Q :) The maximum permissible shear stress given in IS : 456-1978 is based on:

A : Diagonal tension failure

B : Diagonal compression failure

C : Flexural tension failure

D : Uniaxial compression

Q :) For vertical stirrups, the maximum spacing of shear reinforcement measured along the axis of the members shall not exceed

A : 0.70 d

B : 0.75 d

C : 0.80 d

D : 0.90 d

Q :) The maximum shear stress for M-20 grade concrete is

A : 2.8 N/mm^2

B : 3.1 N/mm^2

C : 3.5 N/mm^2

D : 3.7 N/mm^2

Q :) If a bar is cranked at both ends at an angle of 30°, then 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 :) A simply supported beam having 200 mm width and 450 mm effective depth supports a total uniformly distributed load of 2,00,000 N. The nominal shear stress will be nearly.

A : 0.8 N/mm^2

B : 1.1 N/mm^2

C : 1.8 N/mm^2

D : 2.2 N/mm^2

Q :) In case of simply supported beam subjected to U.D.L.w throughout the span which develops maximum B.M. at the mid-span, the cracks formed during the failure of beam at mid-span are

A : Horizontal

B : Inclined at 45^{o}

C : Inclined at 60^{o}

D : Vertical

Q :) In a fixed beam of span ‘L’ subjected to a central concentrated load ‘W’, the fixed end moment and moment at midspan are respectively-

A : $\frac{WL}{12}$ and $\frac{WL}{6}$

B : $\frac{WL}{8}$ and $\frac{WL}{8}$

C : $\frac{WL}{6}$ and $\frac{WL}{12}$

D : None of the above

Q :) A simply supported RC beam carries UDL and is referred as beam A. A similar beam is prestressed and carries the same UDL as the beam A this beam is referred as beam B. The mid-span deflection of beam A will be

A : More than that of beam B

B : Less than that of beam B

C : The same as that of beam B

D : Generally less but sometimes more depending upon the magnitude of UDL

Q :) Maximum allowed deflection in a simply supported RC beam (span, L) under uniformly distributed load including long term elastic and shrinkage effect is :

A : $\frac{L}{350}$

B : $\frac{L}{250}$

C : $\frac{L}{200}$

D : $\frac{L}{175}$

Q :) Permissible deviation from specified dimensions of cross-section of column & beams as per IS standards is ------- mm

A : +10 mm -4 mm

B : +12 mm – 6 mm

C : +14 mm – 8 mm

D : None

Q :) Which of the following are correct for cover to reinforcement?

1. The reinforcement shall have a minimum clear cover of 20 mm or diameter of such bar whichever is more.

2. At each end of reinforcing bar not less than 25 mm nor less than twice the diameter of such bar.

3. Increased cover thickness may be provided when surface of concrete is exposed to the action of harmful chemical.

A : 1, 2 and 3

B : 1 and 2 only

C : 1 and 3 only

D : 2 and 3 only

Q :) In case of a non-cellular, non ribbed flat slab, the spacing of the steel reinforcing bars shall not exceed m times the thickness of the slab, where in m is

A : 1.5

B : 1.2

C : 1.9

D : 2.0

E : 3.0

Q :) The maximum theoretical diameter (in mm) of steel reinforcement in slab 180 mm thick shall be

A : 30.0

B : 36.0

C : 22.5

D : 45.0

E : 18.0

Q :) Thickened part of a flat slab over the supporting column is called

A : Drop panel

B : Capital

C : Column head

D : All of the above

Q :) In case of flat slab, the minimum thickness of slab shall be

A : 100 mm

B : 115 mm

C : 125 mm

D : 130 mm

Q :) In flat slab design, the critical section of shear shall be considered from the periphery of the column / capital / drop panel, perpendicular to the plane of the slab at distance

A : d

B : 2d

C : d/2

D : 1.5d

Where d = Effective depth of slab section

Q :) A steel beam supporting loads from the floor slabs as well as from wall is termed as

A : Stringer beam

B : Lintel beam

C : Spandrel beam

D : Header beam

Q :) Consider the following statements:

1. The minimum steel requirements of slabs are based on considerations of shrinkage and temperature effects alone, and not on strength
2. Providing excessive reinforcement in beams can result in congestion, there by adversely affecting the proper placement and compaction of concrete.

Which of the above statements is/are correct?

A : 1 only

B : 2 only

C : Both 1 and 2

D : Neither 1 nor 2

Q :) According to IS 456, two-way slabs with corners held down are assumed to be divided in each direction into middle strips and edge strips such that the width of middle strip is,

A : Half of the width of the slab

B : Two-third of the width of the slab

C : Three-fourth of the width of the slab

D : Four-fifth of the width of the slab

Q :) Yield line theory results in

A : Elastic solution

B : Upper bound solution

C : Lower bound solution

D : Unique solution

Q :) For simply supported slab, what is the minimum thickness of solid one-way slab taking vertical deflection criteria in consideration?

A : L/8

B : L/24

C : L/20

D : L/10

Q :) The maximum permissible value of ratio of span to depth of a way simply supported RCC slab is

A : 20

B : 30

C : 35

D : 40

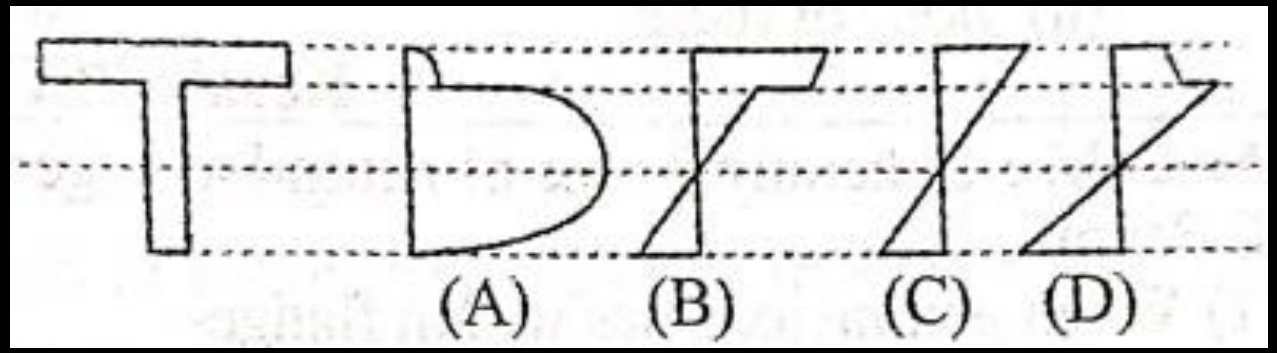
Q :) A cast iron is a T-section as shown. It is supported and carrying a uniformly distributed load. Which of the following is the correct bending stress distribution diagram if the element is stressed perfectly within plastic limit?

A : A

B : B

C : C

D : D



Q :) AS per IS : 456-2000, for R.C.C. T-beam, effective width of flange "b_f" is calculated using equation.....

A : $\frac{l_o}{6} + b_w + 12D_f$

B : $\frac{l_o}{6} + b_w + 6D_f$

C : $\frac{l_o}{3} + b_w + 6D_f$

D : $\frac{l_o}{12} + b_w + 3D_f$

Q :) The effective depth of a T beam for heavy loads is taken as

A : $\frac{1}{10}$ of the span

B : $\frac{1}{12}$ of the span

C : $\frac{1}{15}$ of the span

D : $\frac{1}{18}$ of the span

Q :) The overall depth of a simply supported T-beam is usually assumed as:

A : ½ to ¼ of span

B : 1/12 to 1/15 of span

C : ½ to ¼ of width of flange

D : 2 to 3 times of width of flange

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