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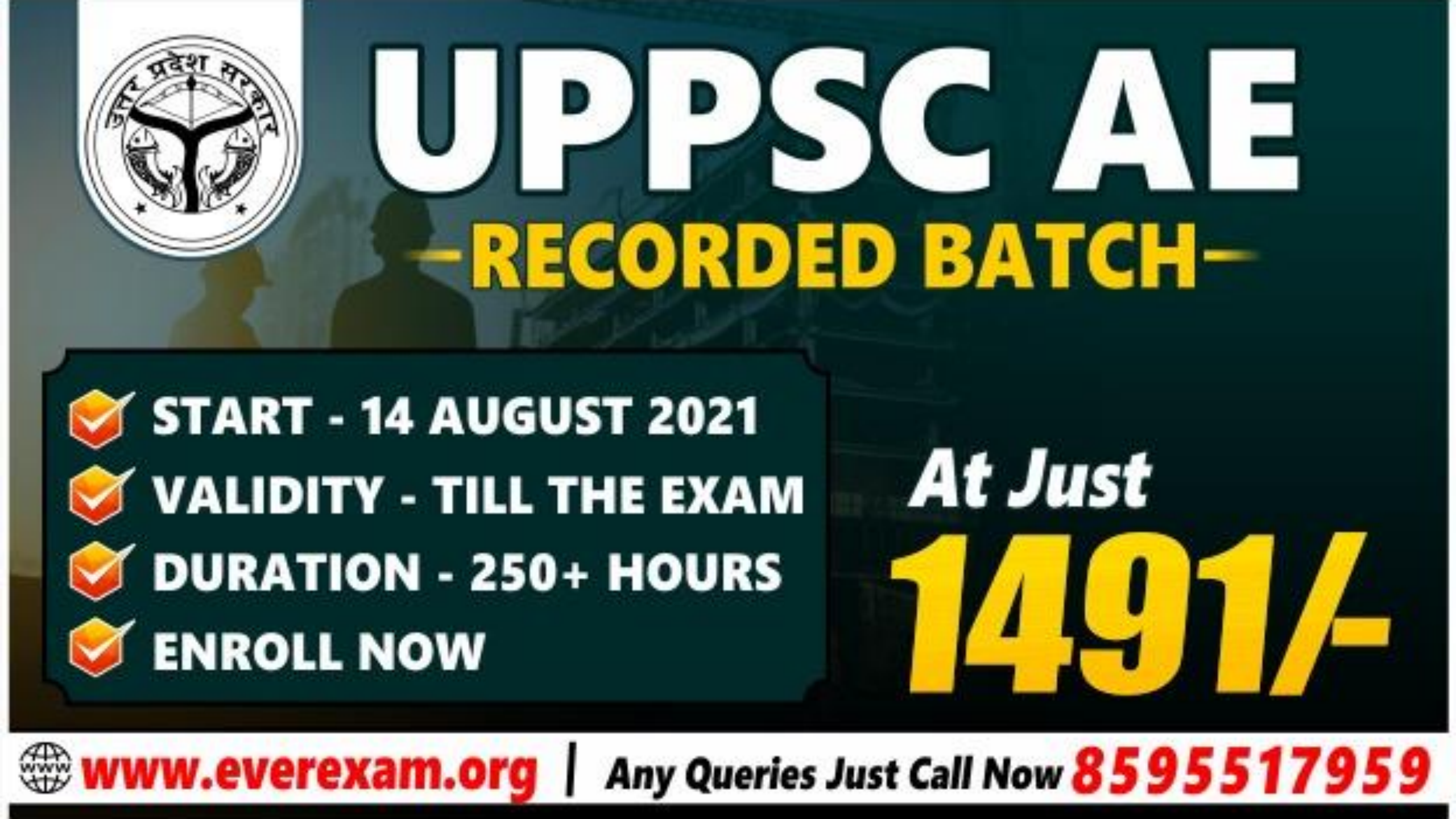
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#4 ALL STATE LEVEL MIXED PRACTICE (recent pattern question)

Q : 1) For the validity of principle of super position, materials should behave in which manner.

A : Linear elastic

B : Nonlinear elastic

C : Nonlinear inelastic

D : Linear-inelastic

Q : 2) For an isotropic, homogeneous and elastic material obeying Hook's law, number of independent elastic constant is

A : 3

B : 1

C : 9

D : None of these

Q : 3) For simply supported beams, the allowable deflection shall not exceed:

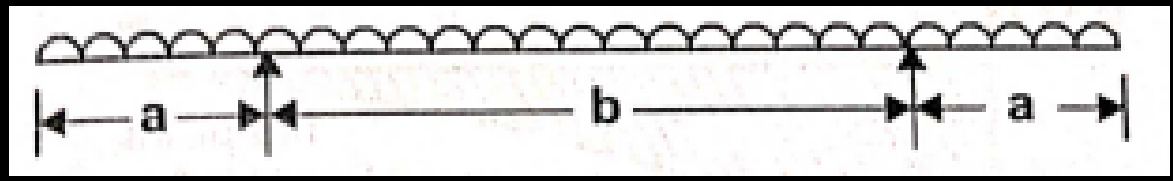
A : 1/325 of span

B : 1/350 of span

C : 1/375 of span

D : 1/400 of span

Q : 4) A horizontal beam carrying uniformly distributed load is supported with equal overhangs is shown in the figure below. The resultant bending moment at the mid-span shell will be zero if (a/b) is:



A : 0.75

B : 0.66

C : 0.5

D : 0.33

Q : 5) A concentrated load W acts at the centre of a simply supported beam of length L. If the load is changed to a uniformly distributed load over the entire span, then the ratio of maximum deflection under concentrated load and under uniformly distributed load will be:

A : 1.2

B : 1.3

C : ¼

D : 8/4

Q : 6) Total strain energy theory for the failure of a material at elastic limit is known as

A : Guest's or Tresca's theory

B : St. Venant's theory

C : Rankine's theory

D : Haigh's theory

Q : 7) The tangential component of stress on an plane inclined θ^o to the direction of the force, may be obtained by multiplying the normal stress by

[A] Sin θ

[B] cos θ

[C] tan θ

[D] $\sin^2 \theta$

A : A only

B : B only

C : C only

D : D only

Q : 8) A cantilever beam of span 'l' subjected to concentrated load 'W' at a distance 'a' from fixed end, the deflection under the point load is:

A : $Wa^3/3EI$

B : $WL^3/3EI$

C : $(1-a)\ Wa^2/3EI + Wa^3/3EI$

D : $W\ (1 – a)^3/3EI$

Q : 9) For a strongest rectangular beam cut from a circular log, the ratio of the width and depth is-

A : 0.303

B : 0.404

C : 0.505

D : 0.707

Q : 10) A circular shaft of diameter d and length L is subjected to a torque T and a bending moment M. The ratio of maximum shear stress to bending stress is:

A : $\frac{T}{M}$

B : $\frac{T}{4M}$

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

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

Q : 11) A beam is supported over three rollers lying 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

D : Only when no load except self-weight acts

Q : 12) Which of the following is a statically determinate structure?

A : Propped cantilever beam

B : Continuous beam

C : Three hinged arches

D : Two hinged arches

Q : 13) For the fixed beam shown below, what will be the moment M_A and M_B, induced due to sinking of right support by Δ, where EI = flexural rigidity of the beam?

A : $M_A = \frac{6EI\Delta}{L^2}, M_B = \frac{6EI\Delta}{L^2}$

B : $M_A = \frac{3EI\Delta}{L^2}, M_B = \frac{6EI\Delta}{L^2}$

C : $M_A = \frac{6EI\Delta}{L^2}, M_B = \frac{3EI\Delta}{L^2}$

D : $M_A = \frac{3EI\Delta}{L^2}, M_B = \frac{3EI\Delta}{L^2}$

Q : 14) A three-hinged parabolic arch has a span of 30 m and the central rise is 5m. It is subjected to a point load of 40 kN at a distance of 20 m from the right hinge. Calculate the vertical reaction component at its left support.

A : 35.35 kN

B : 26.67 kN

C : 40 kN

D : 13.13 kN

Q : 15) The minimum quantity of cement content needed in one m^3 of a reinforcement concrete which is exposed to sea weather conditions is (in kg).

A : 350

B : 200

C : 250

D : 300

Q : 16) Rise of a jack arch is kept about

A : ½ to 1/3 of the span

B : 1/3 to ¼ of the span

C : ¼ to 1/8 of the span

D : 1/8 to 1/12 of the span

Q : 17) The maximum permissible value of organic solids in water, used for the preparation of concrete as per IS 456 : 2000 is

A : 200 mg/l

B : 500 mg/l

C : 3000 mg/l

D : 2000 mg/l

Q : 18) According to IS 456 : 2000, the minimum grade of concrete required for plain concrete and reinforced cement concrete works, under exposure condition “Very severe” are _____ and _____ respectively

A : M15, M40

B : M10, M25

C : M25, M40

D : M20, M35

Q : 19) The length of the straight portion of a bar beyond the end of the hook should be at least

A : Twice the diameter

B : Thrice the diameter

C : Four times the diameter

D : Seven times the diameter

Q : 20) The clear distance between the lateral restraints for a simply supported or continuous beam to ensure lateral stability should not exceed:

A : 60 b^2 or 250 b^2/d whichever is more

B : 60 b or 250 b^2/d whichever is less

C : 60 b or 250 b^2/d whichever is more

D : 60 b or 250 b^2/d whichever is less

Q : 21) If the ratio of the span to the overall depth does not exceed 10, the stiffness of the beam will ordinarily be satisfactory in case of a:

A : Simply supported beam

B : Continuous beam

C : Cantilever beam

D : None of these

Q : 22) Which of the below structure doesn't require pre stressed concrete?

A : Bridge

B : Arch

C : Dam

D : Silos

Q : 23) In the design of structures, an additional lateral load considered, to account for the initial imperfections of the structure geometry is called

A : Rotational load

B : Notional load

C : Damping load

D : Frictional drag load

Q : 24) The maximum allowable vertical deflection under live load for a cantilever member supporting brittle cladding in an industrial building is:

A : Span / 180

B : Span / 120

C : Span / 240

D : Span / 150

Q : 25) The distance between two rivet measured perpendicular to the direction of applied force is known as:

A : Pitch

B : Gauge

C : Staggered pitch

D : Edge distance

Q : 26) Lug angles _____.

A : Are used to reduce the length of connection

B : Are unequal angles

C : Increases shear legs

D : All options are correct

Q : 27) As per IS 800 : 2007, what should be the maximum slenderness ratio for the tension members in which reversal stress due to load other than wind or seismic forces occurs?

A : 350

B : 400

C : 580

D : 180

Q : 28) The thickness t of a single flat lacing should not be less than.

A : 1/30th length between inner end rivets

B : 1/40th length between inner end rivets

C : 1/50th length between inner end rivets

D : 1/60th length between inner end rivets

Q : 29) Which of the following is true?

A : A semi compact section can only be used as a compression member

B : A slender section shall not be used as a compression member

C : A compact or a plastic section can only be used as a compression member

D : A section better than a plastic section can only be used as a compression member

Q : 30) Apart from gravity loads which of the following loads are also considered in the design of a gantry girder located within an industrial building?

(a) Wind load

(b) Longitudinal load

(c) Lateral load

Select the answer using the codes given below:

A : A and B

B : A and C

C : B and C

D : A, B and C

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