- The radial splits which are wider on the outside of the log and narrower towards the pith are known as
  - star shakes
  - annular rings
  - cup shakes
  - heart shakes

  Answer -- annular rings

- Consider the following distinguishing characteristics of hardwood :
  1.They have distinct annular rings.
  2.They are not resinous. Which of these characteristics of hardwood is/are correct?
  - 1 only
  - 2 only
  - Both 1 and 2
  - Neither 1 nor 2

  Answer -- Both 1 and 2

- Consider the following statements on the specific gravity of wood :
  1.It is always greater than 2.
  2.It is less than 1.
  3.It is not dependent upon temperature and equilibrium moisture content.
  4.It is dependent upon type of species.
  - 1,2,3 and 4
  - 1 and 3 only
  - 2 and 3 only
  - 2 and 4 only

  Answer -- 2 and 4 only

- The age of a log of timber can be estimated by
  - diameter of pith
  - thickness of bark
  - number of annular rings
  - number of medullary rays

  Answer -- number of annular rings

- Consider the following statements : Seasoning of timber results in
  1.increased strength
  2.increased durability
  3.reduced resilience
  4.increased dimensional stability
  Which of these statements are correct?
  - 1,2 and 4
  - 1,2 and 3
  - 1,3 and 4
  - 2,3 and 4

  Answer -- 1,2 and 4

- Consider the following statements :Sand in cement mortar is used for
  1.increasing the strength
  2.reducing the shrinkage
  3.decreasing the surface area of the binding material
  4.decreasing the quantity of cement
  Which of these statements are correct?
  - 1,2 and 4
  - 1,2 and 3
  - 1,3 and 4
  - 2,3 and 4
  Answer -- 1,2 and 3

- Consider the following statements :
  1.The compressive strength of concrete decreases with increase in water-cement ratio of the concrete mix.
  2.Water is added to the concrete mix for hydration of cement and workability.
  3.Creep and shrinkage of concrete are independent of the water-cement ratio in the concrete mix.
  Which of these statements are correct?
  - 1 and 2 only
  - 1 and 3 only
  - 2 and 3 only
  - 1,2 and 3
  Answer -- 1 and 2 only

- According to the Indian Standard Specifications, concrete should be cured under a humidity of
  - 90%
  - 80%
  - 70%
  - 60%
  Answer – 90%

- Consider the following statements : In a typical compression test with a cylindrical concrete specimen,failure is initiated by
  1.crushing in compression
  2.inclined shear failure
  3.longitudinal tensile cracks
  Which of these statements is/are correct?
  - 1 only
  - 2 only
  - 3 only
  - 1,2 and 3
  Answer -- 2 only

- If
  A = Cross-sectional area
  E = Young's modulus of elasticity
  G = Modulus of rigidity
  I = Moment of inertia
  J = Polar moment of inertia
  then torsional rigidity is given by
  • AE
  • GE
  • EI
  • GJ
  Answer – GJ

- If a material has identical elastic properties in all directions, it is said to be
  • elastic
  • isotropic
  • orthotropic
  • homogeneous
  Answer – isotropic

- Two circular mild steel bars A and B of equal lengths 1 have diameters dA = 2 cm and dB = 3 cm. Each is subjected to a tensile load of magnitude P.The ratio of the elongations of the bars 1A / 1B is
  • 2/3
  • 3/4
  • 4/9
  • 9/4
  Answer – 9/4

- In a two-dimensional stress system,the radius of the Mohr's circle represents
  • maximum normal stress
  • minimum normal stress
  • minimum shear stress
  • maximum shear stress
  Answer --maximum shear stress

- Steel has proportionality limit of 300 MPa in simple tension. It is subjected to principal stresses of 120 MPa (tensile), 60 MPa (tensile) and 30 MPa (compressive). What is the factor of safety according to maximum stress theory?
  • 1.5
  • 1.75
  • 1.8
  • 2.0
  Answer – 2.0

- In PERT analysis, the time estimates of activities and probability of their occurrence follow
  - beta distribution
  - gamma distribution
  - normal distribution
  - Poisson's distribution
  Answer -- beta distribution

- A sewer of 400mm diameter and slope 1 in 400,running half-full, has a flow velocity of 0.82m/sec. What velocity of flow will be obtained if the slope is made 1 in 100?
  - 3.28m/s
  - 1.64 m/s
  - 0.82m/s
  - 0.41m/s
  Answer -- 1.64 m/s

- A simply supported beam is considered as a deep beam if the ratio of effective span to overall depth is less than
  - 1
  - 2
  - 3
  - 4
  Answer – 2

- The minimum grade of reinforced concrete in seawater as per IS 456-2000 is
  - M 15
  - M 20
  - M 30
  - M 40
  Answer -- M 30

- Torsion reinforcement provided at the corners of a two-way slab
  - distributes bending moment uniformly
  - prevents corners from lifting
  - controls cracking at corners
  - does not allow any twist at corners
  Answer -- controls cracking at corners

- A concrete beam of rectangular cross-section of 200 mm x 400 mm is pre stressed with a force of 400kN at an eccentricity of 100 mm. The maximum compressive stress in the concrete is
  - 12.5N/mm2
  - 7.5 N/mm2
  - 5.0 N/mm2
  - 2.5 N/mm2
  Answer – 12.5N/mm2

- When a pump primes and works but not up to its capacity and pressure,the attributable reasons are as follows :
  1.Speed may be too low.
  2.Suction lift is too high.
  3.Total static head is much higher than as designed.
  4.Foot valve has been removed. Which of these reasons can be valid?
  - 1,2, 3 and 4
  - 1,2 and 4 only
  - 2,3 and 4 only
  - 1,2 and 3 only
  Answer -- 1,2, 3 and 4

- For heavy vibrating loads in industrial buildings,the roof trusses are provided with
  - diagonal bracing in the plane of lower chord members
  - diagonal bracing in the plane of upper chord members
  - knee bracing
  - sway bracing
  Answer -- knee bracing

- Which of the following elements of a pitched roof industrial steel building primarily resists lateral load parallel to the ridge?
  - Bracing
  - Purlin
  - Truss
  - Column
  Answer – Purlin

- Purlins are to be chosen for a roof truss of 20 m span, 4 m rise.Trusses are spaced at 4.5m center-to-centre.A most efficient design results from the use of
  - angle sections
  - channel sections
  - circular hollow sections
  - square hollow sections
  Answer -- channel sections

- The development length in compression for a 20 mm diameter deformed bar of grade Fe 415 embedded in concrete of grade M 25, whose design bond stress is 1.40N/mm2, is
  - 1489 mm
  - 1289 mm
  - 806 mm
  - 645 mm
  Answer -- 645 mm

- Magnitudes of minimum reinforcement recommended for reinforced concrete using mild steel in slabs/columns are
  - 0.15% / 0.60%
  - 0.25% / 0.80%
  - 0.50% / 1.00%
  - 0.15% / 0.80%

  Answer --0.15% / 0.80%

- Which of the following assumptions is/are implied in the table listing moment coefficients for continuous slabs?
  1. Load is distributed uniformly along supports.
  2. Mid-span deflections in orthogonal directions are the same
  3. Load distribution along each support is triangular.
  4. Support moment is about 1.5 times the span moment.
  - 1,2, 3 and 4
  - 2 only
  - 3 only
  - 4 only

  Answer -- 2 only

- In an isolated reinforced concrete column footing of effective depth d,the stress in punching shear is checked
  - at the center of the column
  - at the face of the column
  - at a distance d /2 away from the face of the column
  - at a distance d /2 away from the center of the column

  Answer -- at a distance d /2 away from the face of the column

- The additional cover thickness to be provided in reinforced concrete members that are totally immersed in seawater is
  - 25 mm
  - 30 mm
  - 35 mm
  - 40 mm

  Answer – 40mm

- A rectangular beam of width 100 mm is subjected to a maximum shear force of 60 kN. The corresponding maximum shear stress in the cross-section is 4 N/mm2. The depth of the beam should be
  - 200 mm
  - 150 mm
  - 100 mm
  - 225 mm

  Answer -- 225 mm

- In a circular shaft of diameter d,subjected to a torque r,the maximum shear stress induced is
  - proportional to d3
  - proportional to d4
  - inversely proportional to d3
  - inversely proportional to d4
  Answer --inversely proportional to d3

- Which of the following terms represents the torque corresponding to a twist of one radian in a shaft over its unit length?
  - Torsional stress
  - Torsional rigidity
  - Flexural rigidity
  - Moment of resistance
  Answer --Torsional rigidity

- If a shaft is turning at N r.p.m. and the mean torque to which the shaft is subjected is T N-m, the power transmitted by the shaft in kW would be
  - 2piNT/45000
  - 2piNT/60000
  - 2piNT/30000
  - 2piNT/33000
  Answer –2piNT/60000

- The polar modulus of a circular shaft of diameter d is
  - pi*d*d*d/16
  - pi*d*d*d/32
  - pi*d*d*d/64
  - pi*d*d/32
  Answer –pi*d*d*d/16

- A uniformly distributed load of length 8 m crosses a simply supported girder of span 20 m. The maximum bending moment at the left quarter-span point occurs when the distance between the point of CG of the total load and mid-span is
  - 2m
  - 3m
  - 4m
  - 0m
  Answer – 2m

- Consider the following statements :
  1.The principle of superposition will hold good for the analysis of linear structural systems only.
  2.The stress in a structural member due to several applied forces is the sum of the effects due to each of such forces,applied one at a time, only if the Hooke's law holds good.
  3.Internal stresses may not be caused resulting from lack of fit of a structural member. Which of these statements are correct?
  - 1,2 and 3
  - 1 and 2 only
  - 2 and 3 only

- 1 and 3 only

Answer -- 1 and 2 only

- Consider the following statements

  1.A properly constrained rigid system has several degrees of freedom.

  2.The number of degrees of freedom of a locomotive moving on a railway track is only two.

  3.A floating ship has six degrees of freedom. Which of these statements is/are correct?

  1,2 and 3

  3 only

  2 only

  1 only

  Answer -- 3 only

- A suspension bridge with a two-hinged stiffening girder is statically
  - determinate
  - indeterminate to 1 degree
  - indeterminate to 2 degree
  - indeterminate to 3 degree

  Answer –determinate

- Statement (1):

  Planks sawn from trees with twisted fibers are stronger than those cut from trees with normal growth.

  Statement (II):

  Timber from trees with twisted fibers is used straightaway as poles.

  a

  b

  c

  d

  Answer – d

- Statement (I):

  Attention must be extended to the results of the phenomenon of bulking of sand towards ascertaining the water demand in mortar preparation.

  Statement (II):

  The total volume of mortar prepared per batch of mix preparation for use-in-work should be mindful of the initial settling time.

  a

  b

  c

  d

  Answer – b

- Statement (I):

  The sludge processing utilizes the aerobic digestion in which it is converted to CO_2 and methane.

  Statement (I1):

  The acid-forming bacteria convert the complex organics such as fats,proteins and carbohydrates

into organic fatty acids. The methane-forming bacteria convert organic acids to CO_2 and CH_4.
a
b
c
d
Answer – d

- Statement (I):
Timber suitable for tension members is obtained from coniferous trees.
Statement (I1):
Coniferous trees have distinct annular rings and straight grains.
a
b
c
d
Answer – a

- Statement (I):
Closely-graded materials are better than well-graded materials in so far as designs of concrete mixes are concerned.
Statement (II):
Inter-particle spaces must be well-packed densely for resulting in a good mix.
a
b
c
d
Answer – a

- Statement (1):
Finer grinding of cement results in early development of strength.
Statement (II):
Rate of hydration of cement is increased when it is ground finer.
a
b
c
d
Answer – a

- Statement (I):
When plastering on building exteriors, more of coarser particles of sand are used in regions where seasonal rainfall is often intense and the total annual rainfall also is relatively more.
Statement (11):
Such type of 'dhabbah' plastering effects the minimization of rainfall impacts resulting in less formation of mosses and less surface dis coloration but may not reduce seepage to the interior.
a
b
c
d

Answer – a

- A rectangular tank 10 m x 5 m in plan and 3 in deep is divided by a partition wall parallel to the shorter wall of the tank. One of the compartments contains water to a depth of 3 in, and the other a lighter liquid of specific gravity 0.75 to a depth of 2 m. The resultant pressure thrust on the partition wall is
  - 1000 kg
  - 1500 kg
  - 2000 kg
  - 2500 kg
  Answer -- 1500 kg

- The thickness of the laminar boundary layer over a flat plate at two different sections P and Q are 0.8 cm and 2.4 cm respectively. If the section Q is 3.6 m downstream of P, the distance of section P from the leading edge of
  - 0.32 m
  - 0.22 m
  - 0.40 m
  - 0.53 m
  Answer --0.40 m

- A high tension cable 5cm in diameter is strung-out between two towers. At a wind velocity of 22.22 m/s (corresponding Reynolds number being 7.4x104) the frequency of vortex shedding is
  - 100 Hz
  - 9.33Hz
  - 93.3 Hz
  - 10.0Hz
  Answer --100 Hz

- The velocity of pressure wave in water of infinite extent is 1414m/s. The velocity of propagation of water hammer pressure in a pipe carrying water and having diameter =40cm,pipe thickness=4mm, with E(Modulus of elasticity) of the pipe material =2.1x10 to the power 11 Pa, and K(Bulk modulus of water) = 2.1 x 10 to the power 9 Pa, is
  1410 m/s
  2000 m/s
  1000 m/s
  700 m/s
  Answer -- 1000 m/s

- Consider the following statements : Air vessels are fitted on the suction and delivery sides of a reciprocating pump to
  1.Achieve higher speed without separation.
  2.Reduce work in overcoming frictional resistance.
  3.Avoid excessive vibration permanently.
  4.Have nearly uniform discharge. Which of these statements are correct ?
  - 1,2 and 4 only
  - 1,2 and 3 only
  - 2,3 and 4 only

• 1,2, 3 and 4
Answer -- 1,2, 3 and 4

• Consider the following statements :
  1.The specific speed for turbines is directly proportional to H to the power 5/4.
  2.The specific speed for turbines is inversely proportional to H to the power 5/4.
  3.The specific speed for pumps is directly proportional to H to the power 3/4 .
  4.The specific speed for pumps is inversely proportional to H to the power 3/4 . Which of these statements are correct ?
  • 1 and 3
  • 2 and 4
  • 1 and 4
  • 2 and 3
  Answer --2 and 4

• A turbine discharging 10 m3/s is to be designed so that a torque of 1600 kg-m is to be exerted on the impeller turning at 200 rpm under the condition that the exiting liquid exerts no moment in spite of its momentum. The tangential component of the velocity at the outer periphery of the impeller of radius 1.0 m is
  • 0-98 m/s
  • 1.57 m/s
  • 2.10 m/s
  • 2.26 m/s
  Answer -- 1.57 m/s

• Two Pelton turbines A and B have the same specific speed and are working under the same head. Turbine A produces 400 kW at 1000 rpm. If turbine B produces 100 kW, then its rpm is
  • 4000
  • 2000
  • 1500
  • 3000
  Answer – 2000

• Consider the following types of turbines :
  1.Francis
  2.Pelton with a single jet
  3.Kaplan The correct sequence of these turbines in increasing order of their specific speeds is
  • 1,3 and 2
  • 2,1 and 3
  • 1,2 and 3
  • 2,3 and 1
  Answer -- 2,1 and 3