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**Q : ) The relation between bulk modulus (K) and Young's modulus (E) and Poisson's ratio ( $1/m$ ) is given by:**

**A:  $K = mE/[3(m - 2)]$**

**B:  $K = mE/(3m)$**

**C:  $K = E/[3(m - 2)]$**

**D:  $K = mE/3$**



**Q : ) Shear stress is \_\_\_\_\_ stress.**

**A: Bending**

**B: Tangential**

**C: Normal**

**D: Proof**

**Q : ) Shear modulus of elasticity is the ratio of \_\_\_\_\_**

**A: Shearing stress and shearing strain**

**B: Compressive stress and strain**

**C: Bending stress and strain**

**D: Tensile stress and strain**

**Q : ) For a material having modulus of elasticity  $E$  and modulus of rigidity  $N$ , it seen that  $E = 2N$ . The bulk modulus  $K$  of the material is:**

**A:  $2 \frac{E}{3}$**

**B:  $\frac{E}{2}$**

**C:  $\frac{E}{4}$**

**D:  $2 \frac{E}{3}$**

**Q : ) A simply supported beam carries a varying load from supported beam carries a varying load from zero to one end and 'w' at the other end. If the length of the beam is 'a', the maximum bending moment will be:**

**A:**  $\frac{wa}{27}$

**B:**  $\frac{wa^2}{27}$

**C:**  $\frac{w^2a}{\sqrt{27}}$

**D:**  $\frac{wa^2}{9\sqrt{3}}$

**Q : ) For a cantilever beam of a length  $L$  subjected to a moment  $M$  at its free end, the shape of shear force diagram is:**

**A: Rectangular with a constant value of  $(M/L)$**

**B: Parabolic**

**C: No shear force at any part of beam**

**D: Linearly varying with zero at free end and maximum at the support**



**Q : ) What is the slope at the end of simply supported beam of span 2 m and load 5 kg/unit length over the entire span?**

**A:  $1/16 EI$**

**B:  $5/3 EI$**

**C:  $1/3 EI$**

**D:  $1/20 EI$**

**Q : ) A cantilever beam of length  $L$  meters is subjected to uniformly varying load, varying from  $0$  kN/m at free end to  $W$  kN/m at fixed end. The deflection at the free end is \_\_\_\_\_ (take  $E$  as modulus of elasticity of material used and  $I$  as moment of inertia of the section).**

**A:  $\frac{WL^3}{60EI}$**

**B :  $\frac{WL^5}{385EI}$**

**C:  $\frac{WL^4}{30EI}$**

**D:  $\frac{WL^4}{45EI}$**

**Q : ) Shear strain energy theory for the failure of a material at elastic limit is due to**

**A: Rankine**

**B: Guest or tresca**

**C: St. Venant**

**D: Von mises**

**Q : ) Which of the following is an assumption made in the theory of simple bending?**

**A: The material of the beam is not homogenous**

**B: The value of young's modulus varies in tension and compression.**

**C: Beam material within elastic limit does not obey Hooke's law**

**D: The beam is in equilibrium**

**Q : ) 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 : ) The ratio of maximum shear stress to average shear stress of a circular beam is:**

**(a)  $\frac{2}{3}$**

**(b)  $\frac{3}{2}$**

**(c)  $\frac{3}{4}$**

**(d)  $\frac{4}{3}$**

**A: A only**

**B: B only**

**C: C only**

**D: D only**

**Q : ) For a beam with rectangular cross section, at the neutral axis, the shear stress axis is always:**

**A: Maximum**

**B: Zero**

**C: Minimum**

**D: Infinity**

**Q : ) Which type of buckling of axially loaded compression steel member occurs when the torsional rigidity of the member is appreciably smaller than its bending rigidity?**

**A: Shear buckling**

**B: Flexural-shear buckling**

**C: Torsional buckling**

**D: Flexural buckling**

**Q : ) The core of a circular section short column of diameter  $d$  is a concentric circular area having a diameter \_\_\_\_\_.**

**A:  $d/4$**

**B:  $d/3$**

**C:  $d/2$**

**D:  $d/8$**

**Q : ) Four columns are identical in all parameters except and conditions. Arrange them in their ascending order of load carrying capacity.**

**(i) Both ends are hinged**

**(ii) Both ends are fixed**

**(iii) One end is fixed and the other end is free**

**(iv) One end is fixed and the other end is hinged**

**A: I, ii, iii, iv**

**B: ii, iv, I, iii**

**C: iii, I, iv, ii**

**D: I, iv, iii, ii**



**Q : ) A pipe of internal diameter 'd' and thickness of wall 't', carries fluid with intensity of pressure 'p'. Hoop stresses in the wall will be:**

- A:**  $\frac{pd}{t}$
- B:**  $\frac{pd}{4t}$
- C:**  $\frac{pd}{2}$
- D:**  $\frac{pd}{2t}$

**Q : ) The following statements (S1, S2, S3) pertain to an under reinforced beam of concrete, Choose the correct statements.**

**S1: These beams are deeper when compared to a balanced beam section.**

**S2: The failure of the beam takes place due to failure of steel**

**S3: These beams undergo large deflections at failure.**

**A: S1 and S3**

**B: S1 and S2**

**C: S2 and S3**

**D: S1, S2 and S3**

**Q : ) For thin slabs and walls, the maximum size of coarse aggregate should be limited to \_\_\_\_\_ the thickness of the concrete section.**

**A: One-fourth**

**B: Two-third**

**C: One-third**

**D: One-third**

**Q : ) The total length of bar having hook at both the ends is**

**A:  $L + 9D$**

**B:  $L + 12D$**

**C:  $L + 18D$**

**D:  $L + 24D$**

**Q : ) According to IS 456 : 2000, the percentage increase in the design bond stress in limit state, for deformed bars in tension (conforming to IS 1786), with respect to plain bars in tension is:**

**A: 50**

**B: 20**

**C: 35**

**D: 60**



**Q : ) A beam curved in plan is designed for**

**A: Bending moment and shear**

**B: Bending moment and torsion**

**C: Shear and torsion**

**D: Bending moment , shear and torsion**

**Q : ) The minimum tension reinforcement (Fe500) in the beam of size 450 mm × 600 mm (effective depth = 550 mm) is:**

**A: 520 mm<sup>2</sup>**

**B: 420 mm<sup>2</sup>**

**C: 580 mm<sup>2</sup>**

**D: 500 mm<sup>2</sup>**

**Q : ) Identify the INCORRECT statement about pitch of the lateral ties in the RCC column.**

**A: Pitch must be less than or equal to 300 mm.**

**B: Pitch must be less than 24 times the diameter of the lateral dimension of the lateral ties.**

**C: Pitch must be less than lateral dimension of column.**

**D: Pitch must be less than 16 times of smallest diameter of longitudinal bar in column.**

**Q : ) For a structural element in steel structure, which of the following is a limit state of strength?**

**A: Deflection**

**B: Fire**

**C: Durability**

**D: Torsion**

**Q : ) Wind load analysis can be done by using:**

**A: IS 875 – part 1**

**B: IS 875 – part 3**

**C: IS 875 – part 2**

**D: IS 875 – part 5**

**Q : ) Lug angle is**

**A: Used with single angle member**

**B: Not used with double angle member**

**C: Used with channel member**

**D: All option are correct**

**Q : ) Which of the following is a fillet weld?**

**A: Single bevel**

**B: Mitre**

**C: Square**

**D: Single J**

**Q : ) The minimum spacing for M20 bolts, of grade 4.6, according to IS800, is:**

**A: 37.4 mm**

**B: 55 mm**

**C: 50 mm**

**D: 33 mm**



**Q : ) A tension member, if subjected to possible reversal of stress due to wind, the slenderness ratio of the member should not exceed**

**A: 180**

**B: 200**

**C: 250**

**D: 350**

**Q : ) According to IS 800 : 2007, what is the maximum permissible effective slenderness ratio for a tension member in which the reversal of direct stress occurs due to the loads other than the wind or seismic forces?**

**A: 350**

**B: 250**

**C: 300**

**D: 180**

**Q : ) Effective length of battened columns is increased by**

**A: 5%**

**B: 10%**

**C: 15%**

**D: 20%**

**Q : ) In double lacing, the thickness 't' of flat lacing is**

**A: t is less than  $1/40^{\text{th}}$  length between inner end rivets**

**B: t is less than 1.50 length between inner end rivets**

**C: t is less than  $1/60^{\text{th}}$  length between inner end rivets**

**D: t is less than  $1/70^{\text{th}}$  length between inner end rivets**

**Q : ) What is the effective length of a compression member having actual length  $L$ , when effectively held in position at both ends and restrained against rotation at one ends?**

**A: 1.00 L**

**B: 0.65 L**

**C: 1.50 L**

**D: 0.80 L**

**Q : ) 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 : ) In case of a simply supported rectangular beam of span  $L$  and loaded with a central load  $W$ , the length of elasto-plastic zone of the plastic hinge is**

**A:**  $\frac{L}{2}$

**B:**  $\frac{L}{3}$

**C:**  $\frac{L}{4}$

**D:**  $\frac{L}{5}$

**Q : ) For a fixed-end beam of length  $L$  and central point load of  $W$ , what will be the value of  $W$  at collapse?**

**(Note: Plastic moment capacity of beam =  $M_p$ )**

**A:  $6 M_p/L$**

**B:  $10 M_p/L$**

**C:  $9 M_p/L$**

**D:  $8 M_p/L$**



**Q : ) Which of the following pairs is correctly matched with respect to type of stone, based on its formation?**

**A: Sandstone : Igneous rock**

**B: Granite : Argillaceous rock**

**C: Limestone : Sedimentary rock**

**D: Basalt : Metamorphic rock**

**Q : ) Limestone is a type of:**

**A: Plutonic rock**

**B: Igneous rock**

**C: Sedimentary rock**

**D: Metamorphic rock**

**Q : ) What is the standard size of wood specimen for testing durability?**

**A: 500 × 50 × 50 mm**

**B: 600 × 50 × 50 mm**

**C: 400 × 40 × 450 mm**

**D: 600 × 60 × 60 mm**

**Q : ) According to IS 1077-1992, the average compressive strength of burnt clay bricks with class designation 15 is:**

**A: 15 N/mm<sup>2</sup>**

**B: 15 kN/mm<sup>2</sup>**

**C: 15 kN/mm<sup>2</sup>**

**D: 15 N/m<sup>2</sup>**

**Q : ) Which of the following statement is true?**

**(a) Mud plastering does not require curing**

**(b) Mud plastering requires curing**

**(C) It depends on the situation**

**A: Only A**

**B: Only B**

**C: Only C**

**D: None of these**

**Q : ) A very small amount of \_\_\_\_\_ is useful in making sound cement. If it is in excess, it causes the cement to become unsound.**

**A: Silica**

**B: Sulphur**

**C: Iron oxide**

**D: Alkali**

**Q : ) For concreting tunnel linings, transportation of concrete is done by which of the following?**

**A: Pans**

**B: Wheel borrow**

**C: Containers**

**D: Pumps**

**Q : ) The percentage of fly ash used in high volume fly ash concrete is:**

**A: Greater than 90%**

**B: 10-25%**

**C: 70-80%**

**D: 50-60%**



**Q : ) Membrane curing is done by:**

**A: Applying paraffin or resin-based liquids on the surface of the concrete**

**B: Applying steam on the surface of the concrete**

**C: Ponding of water on the surface of the concrete**

**D: Applying spray of water on the surface of the concrete**

**Q : ) The 'no fines concrete' is used for:**

**A: Higher workability**

**B: Higher strength**

**C: Higher durability**

**D: Higher permeability**

**Q : ) Given below are the statements (S1 and S2) associated with fresh concrete.**

**S1 : As the compaction factor of concrete sample increases, its slump value also increases.**

**S2 : Slump cone test helps in qualitatively understanding the strength of concrete**

**Identify the correct inference (S).**

**A: S1 is false and S2 is true**

**B: Both S1 and S2 are true**

**C: S1 is true and S2 is false**

**D: Both S1 and S2 are false**

**Q : ) The difference in 7 days compressive strength of cubes or cylinders prepared with impure and pure waters should not differ by more than:**

**A: 10%**

**B: 5%**

**C: 12%**

**D: 2%**

**Q : ) Chowkhat or frame of the door is measured in**

**A: Cubic meter**

**B: Meter**

**C: Quintal**

**D: Square meter**

**Q : ) The book value of a property in a particular year is the:**

**A: Value at the end of utility period**

**B: Original cost minus the amount of depreciation till date**

**C: Mark value**

**D: Original cost minus the amount of depreciation up to the previous year**

**Q : ) In the construction industry, contractor's profit is included in \_\_\_\_\_**

**A: Work changed establishments**

**B: Specifications**

**C: Contingencies**

**D: Unit rate of items**



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