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Q:) Consider the following statement regarding a under reinforced rectangular section

1. Concrete develops allowable compressible stress
2. Concrete develops stress less than allowable stress
3. Steel develops allowable tensile stress
4. Steel develops stress less than allowable stress.

Of these statement

A : 1 and 3

B : 1 and 4

C : 2 and 3

D : 2 and 4

Q:) Flexural collapse in over reinforced beams is due to

A : Primary compression failure

B : Secondary compression failure

C : Primary tension failure

D : Bond failure

Q:) Equivalent area of a reinforced cement concrete section is:

A : $m A_c + A_{st}$

B : $A_c + A_{st}$

C : $A_c + A_{st}$

D : $(A_c + m A_{st})\sigma_c$

Q:) A RCC beam of 200 mm width and 300 mm effective depth is reinforced with Fe 415 grade steel. The grade of concrete used is M20. The limiting moment carrying capacity of its this Beam is

A : 47.88 kNm

B : 53.28 kNm

C : 49.68kNm

D : None of the above.

Q:) In design codes, the deflection of beams are controlled by limiting which of the following?

A : Depth

B : Effective length

C : Span

D : Span to effective depth ratio

Q:) The balanced design gives

A : Smallest concrete area and maximum A_{st}

B : Smallest concrete area and minimum A_{st}

C : Largest concrete area and maximum Ast

D : Largest concrete area and minimum A_{st}

Q:) Compared to working stress method of design, to what level is concrete taken by limit state method?

A : A higher stress level

B : A lower stress level

C : The same stress level

D : Sometimes higher but generally lower stress level

Q:) For a beam of uniform strength keeping its depth constant the width will vary in proportion to

A : Bending moment (M)

B : √M

C : M^2

D : None of the above

Q:) Which of the following required greatest deformation?

A : General shear failure

B : Composite shear failure

C : Rigid failure

D : Local shear failure

Q:) In the steel reinforcement calculation for RCC the additional length for two 45° bent-ups in reinforcing bars is.

A : 42 times the length of distance between the centre of the upper and lower arms of the bent up bars

B : 84 times the total depth of beams or slab minus bottom and top cover

C : (1-sin 45°) times the total depth of beam or slab minus bottom and top cover

D : Sin 45° times the length of distance the centre of the upper and lower arms of the bent up bars.

Q:) As per IS:2000, in design of flexural members, for curtailment, reinforcement shall extend beyond the point at which it is no longer required to resist flexural for a distance equal to ____ whichever is greater, except at simple support or end of cantilever.

A : The effective depth of the member or 12 times the bar diameter

B : The effective depth of the member or 16 times the bar diameter

C : The overall depth of the member or 12 times the bar diameter

D : The overall depth of the member or 16 times the bar diameter.

Q:) The minimum shear stress for M30 concrete grade-/

A : 2.5

B : 2.8

C : 3.5

D : 4

Q:) Match List - I (beam variable) with List - II(design provision) and select the correct answer using the code given below the lists:

List - I	List - II
A. Flexure	1. Minimum depth of section
B. Shear	2. Longitudinal steel reinforcement
C. Bond	3. Stirrups
D. Deflection	4. Anchorage in support

Codes:

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

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

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

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

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:) For 45° bent up bar the additional length of one bent up bar is:

A : 0.9d

B : 0.42d

C : 0.09d

D : 0.52d

Q:) Using 2 legged vertical stirrups of 6 mm diameter mild steel (Fe 250) find spacing to resist 70.0 kN shear force. Size of the beam is 300 mm × 1000 (effective)

A : 175 mm

B : 117mm

C : 300mm

D : 250mm

Q:) As per IS: 456-2000, regarding slenderness limits, a simply supported or continuous beam shall be so proportioned that the clear distance between the lateral restrains does not exceed _____, whichever is less, where d is the effective depth of the beam and b the breadth of the compression face midway between the lateral restrains.

A : $\frac{250b^2}{d}$ *or* $60b$

B : $\frac{150b^2}{d}$ *or* $30b$

C : $\frac{250b^2}{d}$ *or* $30b$

D : $\frac{150b^2}{d}$ *or* $60b$

Q:) Calculate the maximum factored bending moment of rectangular beam for an effective span of 6m. The superimposed load is 84 kN/m. The dimensions of the beam are limited to 35.5 cm × 75 overall. Use M-20 and Fe415 grade density of concrete is 25 kN/m^3

A : 612 kN-m

B : 620 kN-m

C : 630 kN-m

D : 600 kN-m

Q:) Effective span of a freely supported beam or slab is

A : Distance between the centre of the end supports

B : Clear distance between the support plus the effective depth of the beam

C : Clear distance between support plus twice the effective depth of the beam

D : Least of (a)&(b)