Program: BE **Civil Engineering**

Curriculum Scheme: **Revised 2012**

Examination: **Fourth Year** Semester: **VII**

Course Code: **CEC701** Course Name: **Limit State Method for Reinforced Concrete Structures**

Time: **1 hour** Max. Marks: **50**

Note to the students: All the Questions are compulsory and carry equal marks.

Q1.	In Ultimate Load Method (ULM), which stress block is used?
Option A:	Triangular stress block
Option B:	Whitney's rectangular stress block
Option C:	Rectangular & parabolic stress block
Option D:	Parabolic stress block
Q2.	The depth of balanced neutral axis for a beam with Fe 415 steel bars, in limit state method of design is ('d' is effective depth)
Option A:	0.46d
Option B:	0.48d
Option C:	0.53d
Option D:	0.55d
Q3.	With usual notations, which of the following expressions is correct for the stress block in Limit State Method?
Option A:	$0.44f_{ck}X_u$
Option B:	$0.50f_{ck}X_u$
Option C:	$0.36f_{ck}X_u$
Option D:	$0.55f_{ck}X_u$
Q4.	The Young's modulus of concrete as per IS456:2000 is taken as
Option A:	$4000\ (f_{ck})^{1/2}$
Option B:	$4500\ (f_{ck})^{1/2}$
Option C:	$4700\ (f_{ck})^{1/2}$
Option D:	$5000\ (f_{ck})^{1/2}$
Q5.	With usual notations, for the expression ($M_{ulim} = Q_{lim}bd^2$) , Q_{lim} stands for
Option A:	Limiting reinforcement factor
Option B:	Limiting reinforcement index
Option C:	Limiting moment of resistance factor
Option D:	Limiting depth
Q6.	If a balanced beam of effective depth 500 mm has Fe500 steel, the depth of balanced neutral axis is
Option A:	230 mm
Option B:	250 mm

Option C:	260 mm
Option D:	270 mm
Q7.	For a singly-reinforced beam, concrete grade is M30, width is 280 mm & depth of neutral axis is 300 mm from top compression fibre. The total compressive force above the neutral axis is
Option A:	906200 N
Option B:	906500 N
Option C:	907200 N
Option D:	908200 N
Q8.	The minimum tension steel (Fe415) to be provided for a singly reinforced beam with width 250 mm & effective depth 520 mm is
Option A:	288.26 mm^2
Option B:	266.26 mm^2
Option C:	299.26 mm^2
Option D:	200 mm^2
Q9.	For a singly-reinforced beam, with usual notations, what is the depth of resultant compressive force from the top compression fibre?
Option A:	$0.58X_u$
Option B:	$0.42X_u$
Option C:	$0.55X_u$
Option D:	$0.40X_u$
Q10.	For a beam, width is 300 mm, effective depth is restricted to 500 mm, and grade of concrete is M20 & steel grade is Fe415. Applied design bending moment is 207 kNm. It is to be designed as
Option A:	Balanced Singly-reinforced beam
Option B:	Doubly-reinforced beam
Option C:	Plain concrete beam
Option D:	Over-reinforced beam
Q11.	For a T-beam, if depth of flange is greater than (0.43 X Neutral axis depth), the stresses in the flange are
Option A:	Uniform
Option B:	Non-uniform
Option C:	Zero
Option D:	Very high
Q12.	The shear strength of RCC beam depends on
Option A:	Grade of steel
Option B:	Depth of beam
Option C:	Width of beam
Option D:	Grade of concrete & tensile steel percentage

Q13.	Table 19 in IS456: 2000 (Limit State Method) is about
Option A:	shear strength of concrete
Option B:	bending moment coefficient
Option C:	shear force coefficient
Option D:	Torion
Q14.	In case of bent-up bars, contribution of bent-up bars towards shear resistance should
Option A:	not be more than 30% of the total shear resistance
Option B:	not be more than 40% of the total shear resistance
Option C:	not be more than 50% of the total shear resistance
Option D:	not be more than 60% of the total shear resistance
Q15.	The length of steel bar beyond theoretical point of cut-off shall be
Option A:	Anchorage length
Option B:	Development Length
Option C:	Bond length
Option D:	Dowel length
Q16.	A steel bar is bent in to an angle of 90 degrees. The anchorage value is
Option A:	Zero
Option B:	4 times its diameter
Option C:	16 times its diameter
Option D:	8 times its diameter
Q17.	L-beams are subjected to which type of torsion?
Option A:	Primary torsion
Option B:	Secondary torsion
Option C:	Only bending moment
Option D:	Only bending moment and shear force
Q18.	The slab designed as supported on all four sides is called as:
Option A:	One-way slab
Option B:	Two-way slab
Option C:	Three-way slab
Option D:	Four-way slab
Q19.	The percentage of minimum reinforcement for Fe415 steel with respect to gross C/S area in slab is
Option A:	0.11%
Option B:	0.12%
Option C:	0.16%
Option D:	0.17%
Q20.	In design of simply supported slab, the slab depth can be obtained from deflection criterion by using condition

Option A:	(Longer span) / (20 X modification factor)
Option B:	(Longer span) / (26X modification factor)
Option C:	(Shorter span) / (26X modification factor)
Option D:	(Shorter span) / (20X modification factor)
Q21.	The strength of the column with helical reinforcement is what times the strength of similar column with lateral ties?
Option A:	1
Option B:	1.05
Option C:	3
Option D:	1.5
Q22.	As per Euler theory (theoretical), what is the effective length of a column with both ends fixed?
Option A:	0.6 L
Option B:	0.5 L
Option C:	2 L
Option D:	L
Q23.	As per IS 456:2000 what should be the minimum nominal cover to be provided for footing at the bottom?
Option A:	50 mm
Option B:	40 mm
Option C:	25 mm
Option D:	60 mm
Q24.	The critical section of finding maximum bending moment for footing is located
Option A:	At the face of the column
Option B:	At the Edge of the footing
Option C:	At a distance of (d)from the face of the column
Option D:	At a perimeter section at distance of (d/2) from the face of the column
Q25.	A trapezoidal combined footing for two axially loaded columns, is provided when
Option A:	Length of footing is not restricted.
Option B:	When the heavily loaded column is near the property line.
Option C:	When two columns lie very far from each other.
Option D:	When the bearing capacity of soil is more.

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Answer Keys:

Question	**Correct Option** (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	B
Q2.	B
Q3.	C
Q4	D
Q5	C
Q6	A
Q7	C
Q8.	B
Q9.	B
Q10.	A
Q11.	B
Q12.	D
Q13.	A
Q14.	C
Q15.	A
Q16.	D
Q17.	B
Q18.	B

Q19.	B
Q20.	D
Q21.	B
Q22.	B
Q23.	A
Q24.	A
Q25.	B