Program: BE Civil Engineering

Curriculum Scheme: Revised 2016

Examination: Fourth Year Semester VII

Course Code: CE-C702 and Course Name: Theory of Reinforced Concrete Structures

Time: 1hour Max. Marks: 50

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

For the numerical answers, **choose the closest option.**

Q1.	If bending moment due to applied loading exceeds the balanced moment capacity of the beam, which of the following section shall be designed?
Option A:	Singly Reinforced
Option B:	Over-Reinforced
Option C:	Doubly Reinforced
Option D:	Balanced
Q2.	How much percentage increase in the permissible load of column is allowed for a column reinforced with helical reinforcement satisfying the IS Code check as per WSM?
Option A:	5%
Option B:	10%
Option C:	3%
Option D:	30%
Q3.	In WSM, if effect of torsional moment (T) is to be considered in the design, then it shall be added to which of the following?
Option A:	Only in shear force
Option B:	Only in Bending Moment
Option C:	Both in shear force and bending moment
Option D:	Only in dead load.
Q4.	What is moment of resistance for the **over-reinforced section** having b = 230 mm, d = 450 mm, d' = 40, Asc = 603.19 sq.mm and Ast = 942 sq.mm and depth of NA = 148.62 mm? Take M 20 and Fe 415. **Choose closest answer. Use WSM.**
Option A:	71.94 kN m
Option B:	131.54 kN m
Option C:	33.87 kN m
Option D:	22.07 kN m

Q5.	In WSM what is minimum reinforcement required for a beam having 230 mm width and 500 mm effective depth? Use Fe 500
Option A:	315.24 sq. mm
Option B:	138.57 sq. mm
Option C:	578.89 sq. mm
Option D:	195.5 sq. mm
Q6.	Partial safety factor for steel and concrete in LSM is,
Option A:	1.3 and 1.5
Option B:	1.15 and 1.5
Option C:	1.5 and 1.15
Option D:	1.0 and 1.3
Q7.	In Limit state method of design, compressive strength of concrete in the structure shall be assumed as,
Option A:	2/3 times the characteristic strength.
Option B:	1/2 times the characteristic strength.
Option C:	1/4 times the characteristic strength.
Option D:	1/3 times the characteristic strength.
Q8.	Which one of the following statements is **wrong**
Option A:	WSM is based on Elastic Theory
Option B:	LSM is based on actual stress-strain curves of steel and concrete.
Option C:	Exact margin of safety is known in WSM method.
Option D:	WSM gives thicker sections so less economical.
Q9.	A reinforced concrete rectangular beam having 300mm width and 500mm effective depth is subjected to an ultimate shear force of 90kN. What will be the nominal shear stress for this beam section? (**use LSM**)
Option A:	0.9N/sq. mm
Option B:	0.6N/sq. mm
Option C:	0.5N/sq. mm
Option D:	1.35N/sq. mm
Q10.	As per LSM, Characteristic strength fy of stirrups or bent up bars shall not be taken greater than
Option A:	250N/sq. mm
Option B:	500N/sq. mm
Option C:	415N/sq. mm
Option D:	300N/sq. mm
Q11.	The maximum shear stress in a rectangular beam is how many times that of average shear stress?
Option A:	1.15
Option B:	1.25
Option C:	1.75

Option D:	1.5
Q12.	In LSM, maximum spacing of vertical stirrups permitted is
Option A:	d or 300mm
Option B:	0.5d 0r 200mm
Option C:	0.75d or 300mm
Option D:	3d or 300mm
Q13.	A reinforced concrete beam having 300 mm width and 450mm depth is subjected to an ultimate shear force of 40kN and an ultimate torsional moment of 30kNm. What will be the equivalent shear in the beam section? Use LSM
Option A:	40kN
Option B:	200kN
Option C:	150kN
Option D:	100kN
Q14.	What is the factored moment of resistance for a beam with b = 230 mm, d = 450 mm, Asc = 804.25 sqmm, Ast = 1963.5 sqmm d' =67.5 mm? Take M 20 and Fe 415. Take *fsc* = 342 MPa. **Use LSM. Consider appropriate rounding for MR.**
Option A:	234 kN m
Option B:	435 kN m
Option C:	137 kN m
Option D:	318 kN m
Q15.	If a flanged beam with 1000 mm width of flange and 500 mm effective depth is reinforced with 1256.64 sq.mm area, where neutral axis for the flanged beam will lie, if thickness of slab is 120 mm? Take M 20 and Fe 415. **Use LSM**
Option A:	In Web
Option B:	In Flange
Option C:	At the junction of Web and Flange
Option D:	Below the web
Q16.	A beam having 230 mm as width, 350 mm as effective depth and 942 sq.mm as the area of reinforcement, what is the type of the section if M 20 and Fe 415 are used? **Use LSM**.
Option A:	under-reinforced section
Option B:	over reinforced section
Option C:	balanced section
Option D:	doubly reinforced section
Q17.	In case of two way slab, the limiting deflection of the slab is
Option A:	Dependent on both long and short span
Option B:	Primarily a function of the long span
Option C:	Independent of long or short span
Option D:	Primarily a function of the short span

Q18.	For two way slabs of shorter span up to 3.5m and loading class up to 3KN/sq.m, the span to overall depth ratio for continuous slabs, provided with Mild steel bars is
Option A:	20
Option B:	26
Option C:	40
Option D:	32
Q19.	The limits of percentage p of the longitudinal reinforcement in a column is given by
Option A:	0.15 % to 2 %
Option B:	0.8 % to 4 %
Option C:	0.8 % to 6 %
Option D:	0.8 % to 8 %
Q20.	The maximum eccentricity to be considered in a R.C. column of length subject to a minimum of 20 mm l is
Option A:	(L/400)+(lateral dimension/30)
Option B:	(L/500)+(lateral dimension/30)
Option C:	(L/500)+(lateral dimension/25)
Option D:	(L/400)+(lateral dimension/25)
Q21.	Minimum diameter of longitudinal bar in columns is
Option A:	12mm
Option B:	8mm
Option C:	10mm
Option D:	16mm
Q22.	In the case of pedestals nominal longitudinal reinforcement shall not be less than
Option A:	0.18% of the cross sectional area
Option B:	0.20% of the cross sectional area
Option C:	0.15% of the cross sectional area
Option D:	0.10% of the cross sectional area
Q23.	In designing rectangular combined footing, what should be adopted as the design value?
Option A:	Stress distribution
Option B:	Compression index
Option C:	Maximum bending moment
Option D:	Safe bearing pressure
Q24.	According to IS 456-2000, the minimum cover required for reinforcements in footings shall be
Option A:	25mm
Option B:	40mm

Option C:	20mm
Option D:	50mm
Q25.	Critical section for punching shear in isolated footings is taken at the periphery surrounding the column
Option A:	at a distance d/3from the face of column
Option B:	at a distance d/2 from the face of the column
Option C:	at a distance d from the face of the column
Option D:	at a distance d/4 from the face of the column

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

Q16.	B
Q17.	D
Q18.	C
Q19.	C
Q20.	B
Q21.	A
Q22.	C
Q23.	C
Q24.	D
Q25.	B