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Code No. : 15144 S N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. (Civil Engg.) V-Semester Supplementary Examinations, June-2023

Reinforced Concrete Design

Time: 3 hours

Max. Marks: 60

*Note: Answer all questions from Part-A and any FIVE from Part-B
 IS-456-2000 code book allowed*

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	What are the assumptions made in working stress method?	2	1	1	1
2.	Define the terms a) Working Stress b) Limit State	2	1	1	1
3.	Define characteristic strength and characteristic load.	2	1	2	2
4.	Differentiate between the working stress method and limit state design.	2	1	2	2
5.	Sketch the flexural, shear and torsional cracks in a beam.	2	1	3	1
6.	List the factors that will affect the short term deflections of RCC members.	2	1	3	1
7.	Differentiate between one way slab and two way slab.	2	2	4	2
8.	Define yield line and write any three properties of yield lines.	2	2	4	2
9.	What is the difference between short and long columns?	2	3	5	1
10.	Explain one way shear and two way shear in RCC footing.	2	3	5	1
Part-B (5 × 8 = 40 Marks)					
11. a)	Explain under reinforced, balanced and over reinforced section.	4	1	1	2
b)	Using working stress method determine the safe UDL that can be placed on a beam of 230 mm x 600 mm effective dimensions, simply supported over an effective span of 6 m, and reinforced with 4 bars of 20 mm diameter on the tension side. Use M-20 concrete, Fe-415 steel.	4	2	1	3
12. a)	Mention the assumptions in the design of RCC section as per LSD.	3	2	2	2
b)	Design a rectangular beam for an effective span of 5m. The super imposed load is 80 kN/m and size of the beam is limited to 40 cm x 80 cm overall. Use M20 grade concrete and Fe415 grade steel. Adopt limit state method.	5	3	2	3

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13. a)	Define equivalent shear and equivalent torque.	4	2	3	1
b)	Design the reinforcement in a beam of 250 x 500 mm subjected to a factored bending moment of 120 kN-m, a factored twisting moment of 18 kN-m and a factored shear of 100 kN. Adopt M-25 grade concrete and Fe 415 steel and use limit state method.	4	4	3	3
14. a)	Draw yield line pattern for a rectangular slab fixed at all edges.	4	3	4	2
b)	Design a simply supported roof slab for a 8.5m x 4.0 m clear in size if the super imposed load is 5 kN/m ² . Use M20 grade concrete and Fe415 grade steel. Adopt limit state method.	4	4	4	3
15. a)	A short circular RCC column carries a working load of 750 kN axially. Design the column if it is provided with helical reinforcement. Use M20 grade concrete and Fe 415 grade steel. Use limit state method. Draw neat sketches showing reinforcement details.	4	3	5	2
b)	What are the IS specifications required for the design of isolated footings?	4	2	5	3
16. a)	What are the basic properties of concrete and steel materials?	4	2	1	2
b)	Explain the necessity of doubly reinforced beam.	4	3	2	2
17.	Answer any <i>two</i> of the following:				
a)	Explain typical failure modes in torsion.	4	2	3	2
b)	What are the various methods for analysis of slabs?	4	3	4	2
c)	What is the minimum and maximum percentage of steel in Columns as per IS code.	4	4	5	2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	33.75%
iii)	Blooms Taxonomy Level – 3 & 4	46.25%
