Hall Ticket Number:

Code No. : 15158 N/O

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (Civil Engg.) V-Semester Main & Backlog Examinations; Jan./Feb.-2024

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 permitted

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Write working stress principle in design of RCC section.	2	1	1	1
2.	Why Limit state design not preferred for design of Water tank?	2	1	1	1
3.	Differentiate between Characteristic load and Characteristic strength.	2	1	2	1
4.	Differentiate between single reinforced and doubly reinforced section.	2	1	2	1
5.	What are the types of reinforcement used to resist shear in beams?	2	1	3	2
6.	Explain the limit state of serviceability requirements for deflection.	2	1	3	2
7.	Differentiate between Long and short column in RCC.	2	1	4	2
8.	Why the load carrying capacity of circular column with helical reinforcement is high?	2	1	4	2
9.	Draw pressure distribution under footings resting on sandy soils.	2	2	5	1
10.	What is the design load on the footing, if ultimate load capacity of column is 1000kN?	2	2	5	2
	Part-B (5 × 8 = 40 Marks)				
11 a)	Differentiate between balanced, under reinforced and over reinforced sections in working stress method of design.	3	2	1	2
b)	A simply supported beam of size 200 x 450 mm overall depth is reinforced with 4 # 12mm diameter bars. Find the safe uniformly distributed load on a span of 3m. Materials are M25 grade concrete and Fe415 grade steel. (Adopt working stress design method).	5	4	1	2
12 a)	Write the Design philosophy of limit state method.	3	2	2	1
b)	Determine the factored moment of resistance of a beam section 200 mm wide and 480 mm effective depth reinforced with 3-16 mm bars in compression at an effective cover of 40 mm and 4-20 mm bars in tension. The materials are M25 grade concrete and Fe 250 reinforcement of grade Fe415.	5	3	2	2

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13. a)	Explain shear resistance of a R.C. beam.	3	2	3	3
b)	A 8m R.C.C beam of 230mm x 550mm overall dimensions is simply supported at ends. At mid span, the bottom reinforcement is 8nos. 20mm bars and top reinforcement is 4 nos. 16mm bars. Check the deflection of the beam. Use M20 concrete and Fe415 steel.	5	2	3	3
14. a)	Differentiate between the one way and two-way slabs	3	3	4	2
b)	Design a R.C. slab for a room having inside dimensions 3.5m x 7.2m. The thickness of the supporting wall is 230mm. The LL on the slab may be taken as 3 kN/m^2 and floor finish as 1kN/m^2. Assume the slab to be simply supported at the ends. Use M20 concrete and Fe415 steel.	5	4	4	2
15. a)	Calculate the minimum eccentricity for a column if unsupported length is 4m and dimension of the column perpendicular to the axis of bending is 500mm.	4	2	5	3
b)	Evaluate the load carrying capacity of a square column of size 230mm with 6#16mm, Fe415 grade of steel used. Concrete grade is M25.	4	4	5	3
16. a)	Derive the stress block parameters of a reinforced concrete section in flexure., as per IS 456-2000.	4	2	2	2
b)	A rectangular beam of size 230 x 400 mm effective depth is reinforced with 2 # 12mm bars in compression and 3# 16mm bars in tension. Find the maximum stresses in concrete and steel for a bending moment of 35 kNm. Materials are M20 grade concrete and Fe415 grade steel. (Adopt working stress design method)	4	3	2	3
17.	Answer any ***two*** of the following:				
a)	Computation of short term and long term deflections.	4	2	2	2
b)	Torsion reinforcement in slabs.	4	3	2	2
c)	Two way shear in footings.	4	3	3	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	32.5%
iii)	Blooms Taxonomy Level – 3 & 4	47.5%

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