VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD
Accredited by NAAC with A++ Grade
B.E. (Civil Engg.) VI-Semester Main & Backlog Examinations, May/June-2023
Design of Concrete Structures(PE-I)

Time: **3 hours**   Max. Marks: **60**

Note : *Answer all question from **PART-A** and **THREE** questions from **PART-B***
Design charts and table for water tank & Bridge decks
IS 456-2000 are permitted

Part-A (10 × 2 = 20 Marks)

Q. No	Stem of the Question	M	L	CO	PO
1	Define combined footing and list different types of combined footing.	2	1	1	1
2	List the forces acting on the retaining wall.	2	1	1	1
3	Explain under what circumstances combined footing is provided.	2	1	2	1
4	State the three factors that must be considered while designing a RCC tank.	2	1	2	1
5	Sketch the reinforcement details that should be provided in a water tank.	2	1	2	1
6	Discuss the design of circular tanks resting on ground with flexible base.	2	1	3	1
7	Distinguish between T beam bridge and Simply supported slab bridge	2	1	4	1
8	Sketch the dispersion length on RCC bridge.	2	1	3	1
9	List the types of loads on the bridge as per IRC code.	2	1	4	1
10	Sketch the cross section of two lane T beam bridge.	2	1	5	1

Part-B (40 Marks)

11	Design a reinforced concrete combined rectangular slab footing for two columns located at 4.5 m apart. The overall sizes of the columns are 400 mm x 400 mm and 600 mm x 600 mm and they transferring 600 KN and 800 KN respectively. The centre of the lighter column is 0.4 m from the property line. The safe bearing capacity of the soil is 150KN/m². Use M20 concrete and Fe 415 steel.	13	2	1	2
	(or)				
12	Design a counterfort retaining wall if the height of wall above the ground level is 5.5 m, SBC of soil =180 KN/m2, angle of friction $\Phi = 30°$ and unit weight of back fill = 18 KN/m³. Keep spacing of counterforts as 3m. Coefficient of friction between soil and concrete µ=0.5. Adopt M20 grade concrete and Fe 415 steel.	13	2	2	2

13	Design a circular water tank with flexible base resting on the ground to store 50,000 liters of water. The depth of tank may be kept 4 m. Use M 25 concrete and Fe-415 steel.	13	4	3	2
	(or)				
14	Design a water tank of size 3 m x 8 m x 3 m placed on the ground for the following data: Type of soil: submerged sandy soil with γ_s 16 KN/m3, $\Phi = 30°$. Water table can rise up to ground level. Use M25 grade of concrete and Fe 415 steel, unit weight of water=9.8Kn/m^3 ;Live load on roof slab = 2 KN/m^2	13	3	3	2
15	Design a solid slab bridge (for flexure only) for IRC. Class AA - wheeled loading for the following data: Effective span of the bridge = 5.8m Clear width of roadway = 6.80 m Average thickness of wearing coat = 80 mm Grade of Concrete = M20 Grade of Steel = Fe415 Width of the kerb = 600 mm	14	4	4	2
	(or)				
16	Design and detail the interior slab of T-beam bridge with the following data: Spacing of longitudinal main girders =3.0 m; Spacing of cross girders =3.75 m ; Thickness of wearing coat =80 mm ; Live load = Class AA, wheeled vehicle; Grade of concrete =M30 ; grade of steel = Fe415.	14	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	39%
iii)	Blooms Taxonomy Level – 3 & 4	41%

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