JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION- 2024

B.Tech-VIII Semester (CE)

COURSE CODE(CREDITS): 18B1WCE831(3) MAX. MARKS: 35

COURSE NAME: ADVANCED REINFORCED CONCRETE DESIGN

COURSE INSTRUCTORS: Mr. Kaushal Kumar MAX. TIME: 2 Hrs

Note: (a)All questions are compulsory.
(b)Marks are indicated against each question in square brackets.
(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

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Q1. Design a circular water tank with flexible base of 200,000 liter capacity. Depth of water in the tank is 6 m. Use M25/Fe415 steel. Unit weight of water is 9.8kN/m^3. Draw the reinforcement detailing [7, CO4]

Q2. Design the wall of a circular water tank of 8 m diameter and 5 m height. The tank is fixed at the base and resting on the ground. Sketch the details. Use M30/Fe415 [7, CO4]

Q3. Design a cantilever retaining wall to retain horizontal earthen embankment of height 4m above ground level. The density of the backfill is 18kN/m^3 and angle of internal friction is 30°. Use M30 and Fe415 steel. μ= 0.45 [7, CO4]

Q4. Discuss in detail the stability analysis of retaining walls. How earth pressure in retaining walls is calculated? What is a shear key. Why and when and where it is provided in a retaining wall. [7, CO3]

Q5. Using yield line theory deduce an equation to find the collapse load for orthotropically reinforced restrained rectangular two way slab subjected to udl over its entire area. **[7, CO2]**

Table 1: For Hoop Tension T

0.4	+0.149	+0.134	+0.120	+0.101	+0.082	+0.066	+0.049	+0.029	[illegible]	
0.8	+0.363	+0.239	+0.215	+0.109	+0.160	+0.130	+0.096	+0.063	[illegible]	
1.2	+0.283	+0.271	+0.254	+0.234	+0.209	+0.180	+0.142	+0.099	[illegible]	
1.6	+0.265	+0.268	+0.268	+0.266	+0.250	+0.226	+0.185	+0.138	[illegible]	
2.0	+0.234	+0.251	+0.273	+0.285	+0.285	+0.274	+0.232	+0.175	[illegible]	
3.0	+0.134	+0.203	+0.267	+0.322	+0.357	+0.362	+0.330	+0.262	[illegible]	
4.0	+0.067	+0.164	+0.256	+0.339	+0.403	+0.429	+0.409	+0.344	[illegible]	
5.0	+0.025	+0.137	+0.245	+0.346	+0.428	+0.477	+0.469	+0.398	[illegible]	
6.0	+0.018	+0.119	+0.234	+0.344	+0.441	+0.504	+0.514	+0.443	[illegible]	
8.0	−0.001	+0.104	+0.218	+0.335	+0.443	+0.534	+0.575	+0.530	[illegible]	
10.0	−0.001	+0.098	+0.208	+0.323	+0.437	+0.542	+0.608	+0.589	[illegible]	
12.0	−0.005	+0.097	+0.202	+0.312	+0.429	+0.543	+0.628	+0.635	[illegible]	
14.0	−0.002	+0.098	+0.200	+0.306	+0.420	+0.539	+0.639	+0.666	[illegible]	
16.0	0.000	+0.099	+0.199	+0.304	+0.412	+0.531	+0.641	+0.687	[illegible]	

Note 1: γ= Density of the liquid,
Note 2: Positive sign indicates tension.

Table 2: For bending moment M

0.4	+0.0005	+0.0014	+0.0021	+0.0007	−0.0042	−0.0150	−0.0302	−0.0529	−0.0816	−0.120
0.8	+0.0011	+0.0037	+0.0063	+0.0080	+0.0070	+0.0023	−0.0068	−0.0024	−0.0465	−0.079
1.2	+0.0012	+0.0042	+0.0077	+0.0103	+0.0112	+0.0090	+0.0022	−0.0108	−0.0311	−0.060
1.6	+0.0011	+0.0041	+0.0075	+0.0107	+0.0121	+0.0111	+0.0058	−0.0051	−0.0232	−0.050
2.0	+0.0010	+0.0035	+0.0068	+0.0099	+0.0120	+0.0115	+0.0075	−0.0021	−0.0185	−0.043
3.0	+0.0006	+0.0024	+0.0047	+0.0071	+0.0090	+0.0097	+0.0077	+0.0012	−0.0119	−0.033
4.0	+0.0003	+0.0015	+0.0028	+0.0047	+0.0066	+0.0077	+0.0069	+0.0023	−0.0080	−0.026
5.0	+0.0002	+0.0008	+0.0016	+0.0029	+0.0046	+0.0059	+0.0059	+0.0028	−0.0058	−0.022
6.0	+0.0001	+0.0003	+0.0008	+0.0019	+0.0032	+0.0046	+0.0051	+0.0029	−0.0041	−0.0187
8.0	0.0000	+0.0001	+0.0002	+0.0008	+0.0016	+0.0028	+0.0038	+0.0029	−0.0022	−0.0146
10.0	0.0000	0.0000	+0.0001	+0.0004	+0.0007	+0.0019	+0.0029	+0.0028	−0.0012	−0.0122
12.0	0.0000	+0.0001	+0.0001	+0.0002	+0.0003	+0.0013	+0.0023	+0.0026	−0.0005	−0.0104
14.0	0.0000	0.0000	0.0000	0.0000	+0.0001	+0.0008	+0.0019	+0.0023	−0.0001	−0.0090
16.0	0.0000	0.0000	−0.0001	−0.0002	−0.0001	+0.0004	+0.0013	+0.0019	+0.0001	−0.007

Note 1: γ= Density of the liquid,
Note 2: Positive sign indicates tension on the outside.