

The Assam Royal Global University
Royal School of Engineering and Technology
B Tech (Civil Engineering) 8th Semester
Special Supplementary Examination, August 2024
Course Title: Design of Sub-structures
Course Code: CEE022D803

Time: 3 hours

Maximum Marks: 70

Attempt all questions as per instructions given

The figures in the right-hand margin indicate marks

Use of IS Codes IS-456, SP-16 are permitted/Assume missing data, if any, suitably

Section-A

Q. No.	Answer the following in brief (within 50 words)	Marks	CO	BT Level
1(a)	Explain secondary settlement.	2	CO 2	BT 2
1(b)	Explain wash boring method of site exploration.	2	CO 2	BT 2
1(c)	List the differences between Limit state and working state method of design.	2	CO 1	BT 1
1(d)	Explain the overturning stability requirements of retaining wall.	2	CO 2	BT 2
1(e)	Solve to find the nominal shear stress acting on a footing, if the vertical shear force, breadth of critical section and effective depth are 1390kN, 1650mm and 560mm respectively.	2	CO 3	BT 3
1(f)	What is differential settlement?	2	CO 1	BT 1
1(g)	List out the different types of checks used in design of Isolated foundation.	2	CO 1	BT 1
1(h)	What is Safe Bearing Capacity of soil?	2	CO 1	BT 1

Section-B

Q. No.	Answer any two of the following (Within 300 words each)	Marks	CO	BT Level
2 (a)	Analyze and design (Moment check and punching shear check) an isolated footing for a column carrying an unfactored load of 400kN and a uniaxial moment of 60kNm on a soil carrying having a safe bearing capacity of 150kN/m ² . The column dimension is given to be 350mm x 350mm. Use M20 concrete and Fe415 steel.	6	CO 4	BT 4
2 (b)	Analyze and design a rectangular combined footing for two columns 350 x 350 each carrying axial load of 800kN and 350kN. The centre to centre spacing between the column is 4.2m and the safe bearing capacity of supporting soil is 160kN/m ² . Use M20 concrete and Fe415 steel.	6	CO 4	BT 4
2 (c)	Construct design diagram (design, elevation, sections) to illustrate the design of the problem sum in question no 2(b)	6	CO3	BT 3

Q. No.	Answer any two of the following (Within 300 words each)	Marks	CO	BT Level
3 (a)	Explain punching shear failure with help of a diagram.	7	CO 2	BT 2
3 (b)	Analyze and design a pile cap for a four pile group arranged in a square pattern. The safe load capacity of the piles are 200 kN. Diameter of the piles are 400mm. Use M20 concrete and Fe415 steel.	7	CO 4	BT 4
3 (c)	Find the area and depth of foundation of a square column carrying 1200 kN vertical load. The gross bearing capacity of soil is 110 kN/m ² , density is 17.50 kN/m ³ and angle of repose is 29°.	7	CO 1	BT 1

Q. No.	Answer any two of the following (Within 300 words each)	Marks	CO	BT Level
4 (a)	Develop the dimensions of a trapezoidal combined footing for two columns 300 x 300 each carrying axial load of 650kN and 250kN respectively. The center to centre spacing between the column is 4.0m and the safe bearing capacity of the soil is 150kN/m ² . The projection of the footing beyond the heavier column from column outface is to be restricted to 500mm.	7	CO 3	BT 3
4 (b)	Write a short note on Modulus of Subgrade reaction.	7	CO1	BT1
4 (c)	Construct a diagram to illustrate the total active force per unit length of retaining wall when surcharge acts on backfill soil without water table at certain depth. (Assume necessary data)	7	CO 3	BT 3

Q. No.	Answer any two of the following (Within 300 words each)	Marks	CO	BT Level
5 (a)	Explain the importance of ground water table depth in determining of ultimate bearing capacity.	7	CO 2	BT 2
5 (b)	Explain each of the following. i) Skin Friction of pile ii) Cantilever retaining wall iii) Counterfort retaining wall iv) Shear key at base slab of retaining wall.	7	CO 2	BT 2
5 (c)	Find the dimensions suitable for a cantilever retaining wall which is required to support 4.2m high bank of earth above the ground level on the toe side of the wall. Consider the backfill to be level, but subject to a surcharge pressure of 28kN/m ² . Soil is having SBC= 160kN/m ² . Soil have unit weight of 17.5kN/m ³ and angle of shearing resistance of 33°. Angle of wall friction is 26°.	7	CO 1	BT 1

Course Outcomes	Marks Allotted	Percentage
CO1	29	Approx 57%
CO2	27	
CO3	22	Approx 23%
CO4	19	Approx 20%

Roll No:

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The Assam Royal Global University, Guwahati

Royal School of Engineering & Technology

B.Tech. CE Fifth Semester

Special Supplementary Examination, August 2024

Course Title: Constitution of India

Course Code: ILD992A503/POL022C301

Time: 3 Hours

Maximum Marks: 70

Note: Attempt all questions as per instructions given.

The figures in the right-hand margin indicate marks.

Section – A

1. Attempt **all questions**. (Maximum word limit 50) **2 x 8**
- a. What do you understand by constitution?
 - b. Who was the chairman of the Drafting Committee of the Constituent Assembly?
 - c. Mention two qualifications of the President of India.
 - d. What are the three organs of the government?
 - e. Who appoints the governor of a state?
 - f. In which year the 42nd Amendment Act was passed?
 - g. When did Panchayatiraj institutions were constitutionally recognized in India?
 - h. Which part of the Indian Constitution deals with Municipalities?

Section – B

2. Attempt **any one** of the following: **12 x 1**
- a. Discuss the salient features of the Indian constitution.
 - b. Write a note on the Constituent Assembly and its role.
3. Attempt **any two** of the following: **7 x 2**
- a. Write a note on the Directive Principles of State Policies.
 - b. What are the different Fundamental Duties that can be found in the Indian constitution?
 - c. Discuss some major powers of the Prime Minister of India.
4. Attempt **any two** of the following: **7 x 2**
- a. Analyze the powers and functions of a governor in the context of the state government.
 - b. What significant changes did the 42nd Amendment introduce in Indian Constitution?
 - c. Discuss the process of appointment, selection and eligibility criteria of a chief minister.
5. Attempt **any two** of the following: **7 x 2**
- a. Write a note on the functions of the Municipalities.
 - b. Explain the significance of the 73rd Constitutional Amendment Act to the Indian Constitution.
 - c. Discuss the functions of the National Commission for STs.