CBCS SCHEME

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BCV714C

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Design and Execution of Pile Foundations

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain in detail the criterias for selection of piles.	10	L2	CO1
	b.	A concrete pile 45 cm in diameter and 15 m long is driven into a homogeneous mass of clay soil of medium consistency. The water table is at the ground surface. The unit cohesion of the soil under undrained conditions is 50 kN/m^2 and the adhesion factor $\alpha = 0.75$. Compute ultimate load capacity and allowable load with FOS = 2.5.	10	L3	CO1
		OR			
Q.2	a.	Define allowable load, safe load, factor of safety, cutoff level, pile capacity, soil profile.	6	L1	CO1
	b.	Explain step by step procedure of construction of bored cast insitu piles. Also mention requirements of bentonite power and bentonite suspension used for piling work.	14	L2	CO1
		Module – 2			
Q.3	a.	Explain the steps involved in the installation of precast driven piles.	10	L2	CO2
	b.	Explain vertical and lateral capacity.	4	L2	CO2
	c.	Write the formula for analysis of vertical capacity of piles in cohesive soil and cohesion less soil for precast piles in preheated holes.	6	L1	CO2
		OR			
Q.4	a.	Brief on different load tests conducted on piles as per IS2911 (Part A).	10	L2	CO2
	b.	Describe on materials, equipments and construction procedure of under-reamed piles.	10	L2	CO2

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		Module – 3			
Q.5	**a.**	A group of 9 plies with 3 piles in a row was driven into a soft clay extending from ground level to a great depth. The diameter and length of the piles were 30 cm and 10 m respectively. The unconfined compression strength of clay is 70 kN/m^2. If the piles were placed 90 cm centre to centre, compute the allowable load on the pile group on the basis of shear failure criterion for a FOS of 2.5. Take α =- 1.	**10**	**L3**	**CO3**
	b.	Explain general requirement for testing of piles.	**10**	**L2**	**CO3**
		OR			
Q.6	**a.**	Write short notes on pile integrity test, equipments required to conduct PIT, factors affecting the test results.	**10**	**L2**	**CO3**
	b.	Explain : i. Interpretation of test results in identification of defects in pile ii. Limitations of pile integrity test.	**10**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Explain in detail the quality control measures adopted during the construction of BCIS piles.	**10**	**L2**	**CO4**
	b.	List the checklists used for each and every step in the construction of BCIS piles.	**10**	**L2**	**CO4**
		OR			
Q.8	**a.**	Explain the manufacturing procedure of span piles. Also list the characteristics to be inspected.	**10**	**L2**	**CO4**
	b.	Discuss on the modes of failure on helical piles. Also mention applications where helical piles are most suitable.	**10**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Enumerate the challenges in the construction of bored and driven piles.	**10**	**L2**	**CO5**
	b.	List the typical components included in BOQ for BCIS and DCIS piles.	**10**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain the step-by-step procedure for designing a single pile subjected to axial load using PLAXIS 2D.	**10**	**L2**	**CO5**
	b.	Describe in detail the items that should be included in the BOQ for precast driven piles and under-reamed piles.	**10**	**L2**	**CO5**

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