BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BARCH **SEMESTER : III[RD]**
BRANCH: ARCHITECTURE **SESSION : MO/2025**

SUBJECT: AR202 BUILDING CONSTRUCTION & CODES

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Differentiate between shallow and deep foundations based on specific parameters. With the help of neat sketches, explain the following types of foundations: (i) Raft Foundation, and (ii) Composite Pile Foundation.	[5]	CO1 & CO2	Understand
Q.1(b)	Sketch and explain: i) Combined Footing, ii) Cantilever Strap Footing, iii) Grillage Foundation, iv) End bearing Piles and Friction Piles.	[5]	CO1 & CO2	Understand
Q.2(a)	Explain "Formwork" and list the essential qualities of good formwork. With the help of neat sketches (plan and elevation), illustrate the details of timber formwork for any one of the following: (i) Circular RCC Column, or (ii) Square RCC Column.	[5]	CO2	Understand
Q.2(b)	Explain the significance of Shoring, Scaffolding, and Underpinning in the construction industry. Support your explanation with neat, labeled sketches.	[5]	CO1 & CO2	Understand & Analyse
Q.3(a)	Classify Tall building structures. Explain the application area of the following in the construction industry: i) Aerogel, & ii) Thermoplastic Panels.	[5]	CO3	Understand
Q.3(b)	Explain the properties and application areas of the following: i) High Performance Concrete, ii) Light Transmitting Concrete.	[5]	CO3	Understand
Q.4(a)	Prepare a neat sketch of a "1 BHK Residential Unit Plan and Section" showing the minimum standards as prescribed by the National Building Code (NBC) of India. The drawing should clearly indicate: i) Minimum dimensions, areas, and heights of all spaces as per NBC standards. ii) Components of the residence including living room, bedroom, kitchen, toilet/bathroom, and circulation spaces. iii) A staircase, a ramp (for plinth access), and a parapet wall, shown in the sectional view with all minimum dimensions and heights properly labeled. iv) Legible annotations for floor levels, plinth height, headroom, riser and tread sizes, ramp slope, and parapet height.	[5]	CO4	Understand, Analyse & Apply
Q.4(b)	Explain the following: i) Master Plan, ii) Land use Plan. A six-storey building is proposed on a 120 m × 60 m plot with a ground coverage of 55% (Option 1). Alternatively, a three-story building can be constructed on the same plot with a ground coverage of 40% (Option 2). Calculate the ratio of FARs between Option 1 and Option 2.	[5]	CO4	Understand, Analyse & Apply

PTO

Q.5(a)	In a mixed-use development on a 1.5-hectare (15,000 sqm) site with an FAR of 2.5, the ratio of residential to commercial floor area is 4:3. The minimum parking requirement (in ECS) per 100 sqm of residential and commercial floor area is 0.8 and 1.5, respectively. Assuming full FAR utilization, calculate the total parking (in ECS) required for the project.	[5]	CO4	Analyse & Apply
Q.5(b)	Explain the following: i) Refuge Area, ii) Fire Resistance Rating, iii) Compartmentation, iv) Travel Distance, v) Escape Route.	[5]	CO1 & CO4	Understand

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