Enrolment No._____

SARVAJANIK UNIVERSITY

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W-2024 Date: 21-11-24 Time: 09:30 am to 12:30 pm
Regular and Backlog Exam

B. ARCH II- SEMESTER– III EXAMINATION

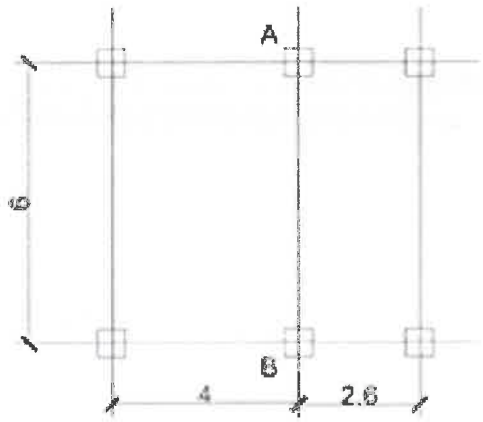
Course Code: BRAR12302 **Total Marks:** 180

Course Name: Building Technology I-Construction, Structure and Services

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4.IS 800:2007, IS 875- part I, part II, part III, and Steel table are allowed to use.
5 Use of a nonprogrammable scientific calculator is allowed.

Q1.	Answer the following (Compulsory)	
A	Do as directed: 1. Average Indian requirement of water demand is _____LPCD 2. Define Grid Iron Pipe Network 3. Define Sewer 4. W.C. having _____type of trap can be hung on the wall 5. Define Sanitation	**5**
B	Answer in Short (4 Marks each) 1. What is form work? 2. Explain dead load for floors 3. Explain waffle slab with Sketches 4. List and explain in brief the four 4 essential phases for construction process. 5. Explain D.P.C. or D.P.M.	**20**
C	Distinguish between one way spanning and two-way spanning for RCC slabs	**10**
Q.2	**Answer the following (With Options)**	
a	What is a trap? Enlist type of traps according to their uses and discuss the general requirement of good traps	**05**
	OR	
a	Define factors that should be considered at the time of selection of any pipe material	
b	Advantages and disadvantages of precast concrete floors OR Compare pre-tensioning and Post tensioning	**5**
c	Write a Short not on Ribbed floor OR Write a Short Note on Concrete jack arch floor	**05**
d	Explain in Detail (ANY TWO) 1. Explain with Sketches and in detail the process of Filler slab with different materials. 2. Explain with sketches and in detail the Types of Flat slab	**10**

	3. Explain Formwork? List the requirements of a good formwork, further explain the purpose of formwork	
Q.3.	**Answer the following (With Options)**	**30**
a	What are septic tanks and where are they used. Discuss with the help of a neat sketch.	
	OR	
a	Draw a toilet layout of 1.5mts x 2.5mts x 2.5mts height in size showing all the plumbing and sanitary fixtures and fittings. (Scale 1:20)	
Q.4.	Design a beam 'AB'; of a school building, given in fig. 4. Use M-20-grade concrete and Fe- 415-grade steel. The live load on a slab is 3 KN / sq.m. Draw your designed section showing reinforcement detailing.  FIG: 4 All dimensions are in Metre	**30**
	Attempt any Three questions out of four. (Q-5, Q-6, Q-7 & Q-8)	
Q-5.		
(A)	A singly reinforced rectangular beam of 230 mm width and 450 mm overall depth is reinforced with 4 no.12 mm diameter bars at the bottom. Calculate the sagging moment of resistance. Use the grade of steel, Fe – 415, and the grade of concrete, M -15.	**12**
(B)	**Do as directed**	**8**
	1. The shear reinforcement in R.C.C. is provided to resist a. vertical shear b. horizontal shear c. diagonal compression d. diagonal tension. 2. The percentage of minimum reinforcement of the gross sectional area in slabs, for Mild steel is a. 0.10% b. 0.12% c. 0.15% d. 0.18%	

	3. The minimum number of main steel bars provided in R.C.C. circular columns is _____ 4. Design of R.C.C. simply supported beams carrying U.D.L. is based on the resultant B.M. at a. supports b. mid span c. every section d. quarter span.	
Q-6.	Design a one way simply supported slab of 3.5m, effective span. If the grade of steel is Fe-415 and that of concrete is M-20. The slab panel is a part of the residential building. Draw your designed section showing reinforcement detailing.	**20**
Q-7.	Design a short RCC column subjected to 2400 KN design load. consider emin =0.05 D Take M 20 & Fe-415 grades of materials. Draw your designed section showing reinforcement detailing	**20**
Q-8.	Design an RCC isolated sloped footing for a 450 mm X 450 mm size column, subjected to 2400 KN load. The allowable bearing capacity of soil is 220 KN/m2, Use M20 & Fe -415 grades of materials. Draw your designed section showing reinforcement detailing	**20**