Enrolment No._____

SARVAJANIK UNIVERSITY

S-2024 Date: 19-04-24 Time: 01:30 PM to 04:30 PM
Backlog Exam

B. ARCH II- SEMESTER– III EXAMINATION

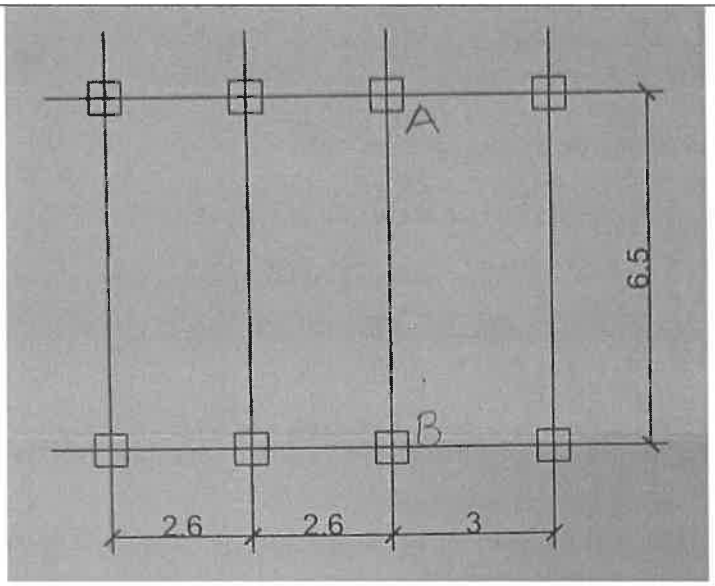
Course Code: BRAR12302 **Total Marks: 180**

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.**

Q1.	**Answer the following (Compulsory)**	
(A)	**Fill in the Blanks:** 1. Average Indian requirement of water demand is _____LPCD 2. _____ traps are used to prevent foul gases entering from public sewer to house drainage system. 3. Full form of R.C.C is _____. 4. Lime, Aggregates and Sand are main components of _____. 5. _____ are Structural properties of concrete.	(05)
(B)	**Do as Directed:** 1. Define Storm water 2. Define Grid Iron Pipe Network 3. Define Sewer 4. Define coarse aggregates. 5. List and explain in brief the four 4 essential phases for construction process. 6. List the pre-construction steps 7. Define floors? 8. Explain dead load for floors 9. Explain waffle slab 10. Explain D.P.C. or D.P.M.	(30)
Q.2	**Answer the following (With Options)**	
A	**Enlists the ground water sources and surface water sources. Explain one in detail.** **OR** **What is a trap? Enlist type of traps according to their uses and discuss the general requirement of good traps.**	(06)
B	**Distinguish between one way spanning and two way spanning RCC slabs** OR **Explain Formwork? List the requirements of a good formwork, further explain the purpose of formwork**	(14)

Q.3.	**Answer the following (With Options)**	
A	**Define factors that should be considered at the time of selection of any pipe material.** **OR** **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)**	(15)
B	**Do as Directed: (ANY FOUR)** **1. Advantages and disadvantages of precast concrete floors** **2. Compare pre-tensioning and Post tensioning** **3. Short Note on Filler slab** **4. Short Note on Types of Flat slab** **5. Short Note on the Waffle slab**	(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.**	**30**
	 FIG: 4 all dimensions are in Metre	
Q-5.	**Attempt any Three questions out of four.**	
(A)	**A singly reinforced rectangular beam of 300 mm width and 550 mm overall depth is reinforced with 3 no.16 mm diameter bars at the bottom. Calculate the sagging moment of resistance. Use the grade of steel, Fe – 500, and the grade of concrete, M -20.**	**12**
(B)	**Do as directed**	**8**
	1. **The function of transverse reinforcements provided at right angles to the main reinforcement is to** **A. distribute the load.** **B. resist the temperature stresses.** **C. resist the shrinkage stress.** **D. all the above.** 2. **An R.C.C. roof slab is designed as a two-way slab if _____.** 3. **Lateral reinforcement in R.C.C. columns is provided to prevent the longitudinal reinforcement from _____** 4. **Shear carrying capacity of vertical stirrups is_____**	

Q-6.	Design a rectangular, simply supported slab of 3.6 m 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 office building. Draw your designed section showing reinforcement detailing.	20
Q-7.	Design a short RCC column subjected to 2000 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 400 mm X 400 mm size column, subjected to 2000 KN load. The allowable bearing capacity of soil is 210 KN/m2, Use M20 & Fe -415 grades of materials. Draw your designed section showing reinforcement detailing	20