Enrolment No._____

SARVAJANIK UNIVERSITY

S-2025 Date: 20-05-25 Time: 09:30 AM to 12:30 PM
Backlog Exam

B. ARCH - 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.

4.IS 456:2000, 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)**	Marks
A	Do as Directed: 1. Define Sewer 2. Define Garbage 3. Define Storm water 4. Average Indian requirement of water demand is _____LPCD 5. _____ traps are used to prevent foul gases entering from public sewer to house drainage system.	5
B	Answer in Short (4 Marks each) 1. Which materials are commonly used for formwork of concrete floors? 2. What is form work? 3. List the Building Construction Step 4. Explain waffle slab with Sketches 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	One pipe system versus two pipe system of drainage. OR	05
A	What is a trap? Enlist type of traps according to their uses and discuss the general requirement of good traps	
B	Write a Short Note on RMC (Ready Mix Concrete Plant) OR Compare pre-tensioning and Post tensioning Methods	5
C	Write a Short Note on Concrete jack arch floor OR Short Note on Filler slab	5
D	Explain in detail (ANY TWO) 1. What is the difference between cast in situ concrete floors and precast concrete floors? Enlist various types of concrete floors and explain Flat Slab in detail.	10

2. Explain Formwork? List the requirements of a good formwork, further explain the purpose of formwork

3. List the types of ground floors. Explain all the construction methods of ground floors with all its components. Enlist the guidelines for erecting ground floor.

Q.3 Answer the following (With Options) 30

A What are manholes? Discuss the components 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 public 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

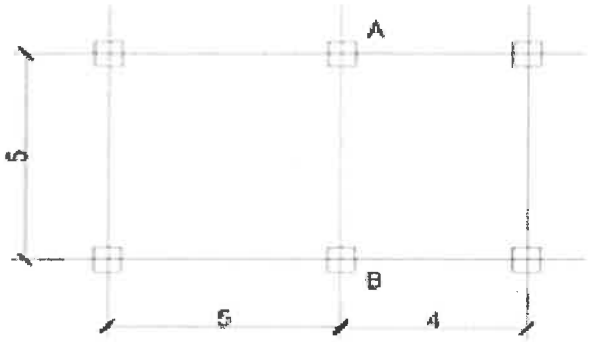

FIG: 4
All dimensions are in Metre

Attempt any Three questions out of four.

Q-5

(A) A singly reinforced rectangular beam of 230 mm width and 400 mm overall depth is reinforced with 3 no.25 mm diameter bars at the bottom. Calculate the sagging moment of resistance. Use the grade of steel, Fe – 250, and the grade of concrete, M-15. 12

(B) Do as directed 8

1.The minimum number of main steel bars provided in R.C.C. rectangular columns is

_____

2. In a singly reinforced beam, if the permissible stress in concrete reaches earlier than that in steel, the beam section is called
   a. under-reinforced section
   b. over reinforced section
   c. economic section
   d. critical section.

3. The spacing of transverse reinforcement of column is decided by the following consideration.
   a. The least lateral dimension of the column
   b. Sixteen times the diameter of the smallest longitudinal reinforcing rods in the column
   c. Forty-eight times the diameter of transverse reinforcement
   d. All the above.

4. An R.C.C. beam not provided with shear reinforcement may develop cracks in its bottom inclined roughly to the horizontal at

a. 25°
b. 35°
c. 45°
d. 55°

Q-6. Design a rectangular, simply supported slab of 3 m X 7 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 3500 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 2100 KN load. The allowable bearing capacity of soil is 210 KN/m^2, Use M20 & Fe -415 grades of materials. Draw your designed section showing reinforcement detailing 20