Enrolment No._____

SARVAJANIK UNIVERSITY

S-2024 Date: 15-07-24 Time: 01:30 PM to 04:30 PM
Remedial Exam

B.ARCH - SEMESTER– IV EXAMINATION

Course Code: BRAR12402 **Total Marks: 180**

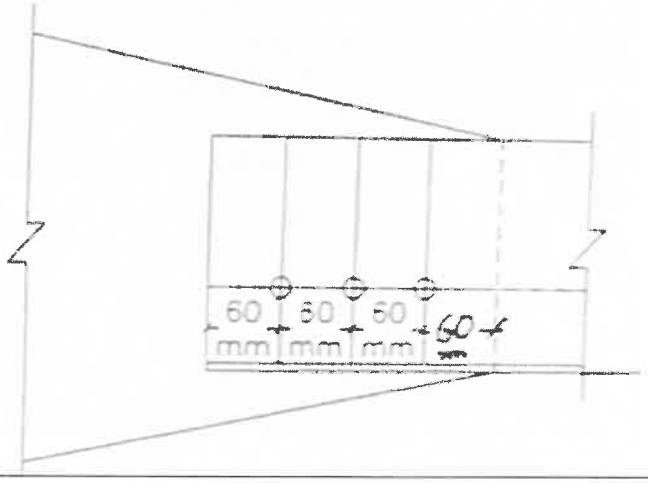
Course Name: Building Technology II- Const., Structure & Services

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Draw a sketch wherever necessary.**
5. **Assume suitable data whenever necessary & specifically mention it.**
6. **IS 800:2007, IS 875- part I, part II, part III, and Steel table are allowed to use.**
7. **Use of a nonprogrammable scientific calculator is allowed.**

		Marks
Q.1.	**Answer the following: (ANY SIX)**	**12**
1	Enlist the types of connections in steel construction	
2	Mention the type of cable shown in the image. 	
3	Define Alternate current	
4	Mention the accessories shown in the Image. 	
5	Which kind current flow in Residence Circuit?	
6	The number of modules in Taipie 101 is _____ and In Taipei 101, use of _____ in the superstructure minimised the building weight which reduced the cost of foundation.	
7	What is a "Belt Truss?" Sketch and explain	
8	The material used as the skin of Bird's Nest Center is_____	
Q.2		
(A)	**Answer the following (Any TWO)**	**20**
1	Explain Key Features of Tinman house with schematic diagrams	
2	Discuss how steel structures can be impacted by environment	
3	Draw schematic plan of Taipei 101 with location of major structural component and explain "super column"	
4	Demonstrate the use of 40'x 8'x6' size container as a functional space. Discuss the design aspects to be taken care of while using containers as a functional space	
(B)	**Answer in Detail**	**30**
	Design a steel structure enclosing an event space covering 45 mt X 60 mt area. Your answer should consist of following points:	
a)	Schematic plan explaining entry, exit, primary zoning (Segregation of	3

	display space and circulation) and location of services for exhibition space	
b)	Sketch of structure visualized to cover the area	3
c)	Types of components selected for the structure (Specify Approx. size)	5
d)	Structural Assembly of the components	5
e)	Location of various structural components in plan (Structural plan at various level explaining various layers, with dimensions	5
f)	Important connection (Joinery) details	10
Q.3.		
(A)	**Answer the following (ANY TWO)**	**08**
1	What are the considerations for choosing the lighting system for a given space.	
2	What should be consider when you buy a electric bulb	
3	What is the difference between wires and cables ?	
4	Mention different types of wire and expalin any three in detail.	
(B)	Draw electrical layout for the plan given in the attached sheet showing 1.SB, light points(wall and ceiling both),fan points and equipments points 2. Electric schedule Note: attach the given plan with answer book	**20**
4 (A)	**Do as directed. / Select the correct answer**	**05**
1	Which type of steel structure is composed of elements that work together to resist applied loads? a) Truss b) Arch c) Beam d) Column	
2	What is the purpose of lateral bracing in a steel structure? a) To support gravity loads b) To provide access between floors c) To resist wind and seismic forces d) To enhance thermal insulation	
3	The Gusseted-based footing is adopted, when ... (a) The column is subjected to heavy loading. (b) The column is subjected to lighter loading. (c) The column is subjected to an Axial loading. (d) The column is subjected to axial plus bending moment	
4	The Rise of the Pitched roof truss is governed by, a) Dead Load b) Live Load c) Wind Load d) Earthquake load	
5	Which type of connection allows relative rotational movement between connected members? a) Pinned connection b) Welded connection c) Bolted connection d) Rigid connection	

4(B)	A single unequal angle ISA 150X75X 10 mm is connected to a 12 mm thick gusset plate by a longer leg with 14 mm diameter bolts to transfer tension as shown in Figure. Determine the tensile strength of the angle section if, the yield & ultimate stress of steel are 250 N/mm^2 & 410 N/mm^2 respectively.  	25
Q5	**Attempt any Three questions out of these four Questions**	**60**
1)	A column comprising ISHB 350 @ 72.4 Kg/m is of a length of 3.5 m. The Column is fixed at both ends. Find the load-carrying capacity of a column. Assume the column is laced, Take fy = 250 N/mm^2	
2)	Calculate the Moment of resistance of a laterally restrained beam, ISLB 550@ 86.3 kg/m, if the span of a simply supported beam is 5 m & subjected to 75 KN/m uniformly distributed load including self-weight.	
3)	Design a slab-based footing for a column section ISHB 350 @ 67.4 Kg/m, subjected to an axial load of 2000 KN. Take SBC of soil =230 KN/sqm, Grade of concrete =M20, fy = 415 N/mm2, E = 2 X 10^5 N/mm^2.	
4)	Sketch and label the following in detail. a) Beam to Beam-to-column stiffened Seat Connection b) Gusseted-based footing.	

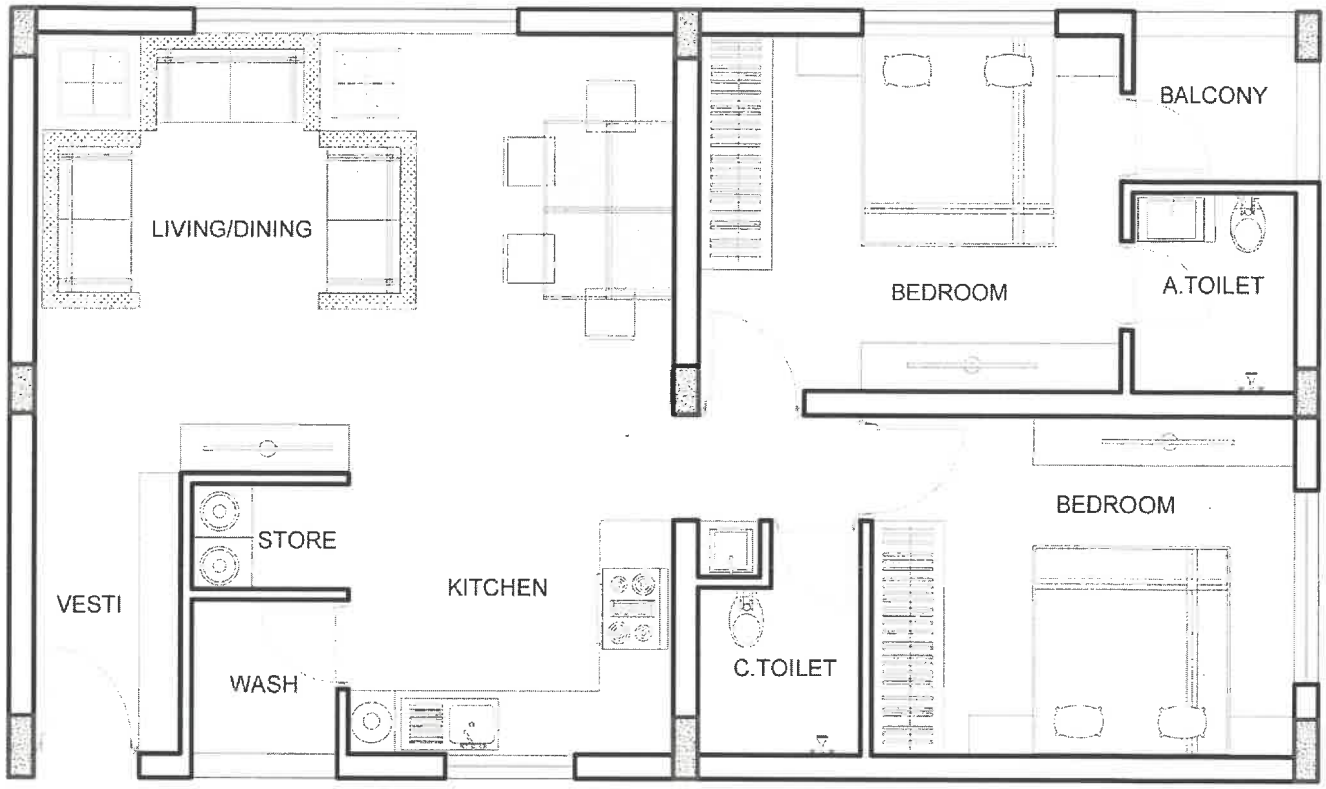

LIVING/DINING
BALCONY
BEDROOM
A.TOILET
BEDROOM
STORE
KITCHEN
VESTI
WASH
C.TOILET

FIG: 3B