

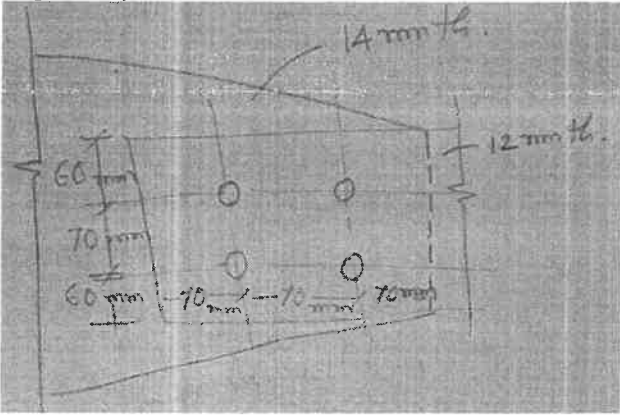
SARVAJANIK UNIVERSITY

S-2025 Date: 02-07-25 Time: 09:30 AM to 12:30 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.

Q.1.		30 Marks
(A)	Answer the following: (Any SIX)	12 Marks
1	Enlist properties of steel.	
2	Sketch the types of steel section commonly used in steel construction.	
3	Enlist the joinery methods used in steel construction.	
4	Steel construction systems are mostly prefabricated system. Why?	
5	Explain Co-Axial cables	
6	Define Lumens	
7	What is MCB?	
8	Explain Earthing.	
(B)	Answer the following (Any THREE)	18 Marks
1	Discuss the advantages and disadvantages of steel construction.	
2	Explain the concept of modular construction with reference to "Container structures" along with its pros and cons.	
3	Explain diagrid structures with example.	
4	Explain steel floor construction with neat and illustrated sketches.	
Q.2.	Answer in Detail	30 Marks
	Design a temporary steel structure for a warehouse of size 15m X 24m. Well-illustrated, neat and clear sketches/drawings (Plans/Sections/Elevations) are expected as an answer of each of the below mentioned point:	
a)	Schematic plan explaining entry, exit, primary zoning and sections-elevations to explain building form	5
b)	Structural grid with location of various structural components in plan (with dimensions) and structural assembly with primary, secondary, tertiary layers	5
c)	Types of components selected for the structure (Specify Approx. size)	5
e)	Covering materials and its fixing details	5
f)	Important connection (Joinery) details	5
g)	Basic electric layout for the space	5
Q.3.		30 Marks
(A)	Answer the following (any TWO)	10 Marks
1	What factors should be taken into consideration while choosing the lighting system for the home	
2	Explain Principle of operation of fuse and criteria for selection of the fuse	
3	Explain the difference between A.C and D.C.	
4	Mention different types of wire and explain 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 Marks
Q.4.		30 Marks
(A)	Do as directed. / Select the correct answer	05 marks
1	The nature of Force Induced in truss members is a) Axial Force b) Transverse plus Axial force c) Transverse Force d) Torsional Force	
2	Select the Limiting 'Width to Thickness' & 'depth to thickness' Ratios for the Flange and Web of the 'I / H' rolled section for Plastic Class-1. a) $b/t_f > 9.4 \epsilon$ & $d/t_w > 84 \epsilon$ b) $b/t_f < 9.4 \epsilon$ & $d/t_w > 84 \epsilon$ c) $b/t_f < 9.4 \epsilon$ & $d/t_w < 84 \epsilon$ d) $b/t_f = 9.4 \epsilon$ & $d/t_w = 84 \epsilon$	
3	Which Section is preferable for column design? a) ISLB b) ISJB c) ISHB d) ISMB	
4	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 .	
5	Which steel section is generally used for steel beams? a) Angle sections b) Hollow Circular section c) I -section d) Flat sections	
(B)	<p>A Single plate tension member of 190 mm X 12 mm is connected to a 14mm thick gusset plate at the ends with 4 -16 mm diameter bolts to transfer tension as shown in Figure. Determine the design tensile strength of the angle section assuming that, the yield & ultimate stress of steel are 250 N/mm² & 410 N/mm² respectively.</p> 	25 marks

	Attempt any Three questions out of this Question Q5 , Q6, Q7 & Q8	
Q5	A column comprising of ISHB 350@ 72.4 Kg/m of length 3.2 m. The lower end of the column is restrained against both rotation and translation, while the upper end is only restrained against translation and free against rotation. Decide the economical spacing 'S' for the column section & find the load-carrying capacity of a column. Assume the column is laced, Take $f_y = 250 \text{ N/mm}^2$	20 marks
Q6	Calculate the Moment of resistance of a laterally restrained beam, ISWB 600@ 145.1 kg/m, if the span of a simply supported beam is 6 m & subjected to 55 KN /m uniformly distributed load including self-weight.	20 marks
Q7	Design a slab-based footing for a column section ISHB 400 @ 77.4 Kg/m, subjected to a factored axial load 1000KN. Take SBC of soil =210 KN/sqm, Grade of concrete =M-15, $f_y = 250 \text{ N/mm}^2$, $E = 2 \times 10^5 \text{ N/mm}^2$.	20 marks
Q8	Sketch and label the following in detail (Any two)	20 marks
	Gusseted-based footing.	
	Beam to column Unstiffened Seat Connection.	

