



SARVAJANIK UNIVERSITY

Enrolment No. _____

S-2026 Date: 05-08-26 Time: 09:30 AM to 12:30 AM
Interim Backlog Exam

B.ARCH - SEMESTER- IV EXAMINATION

Course Code: BRAR12402

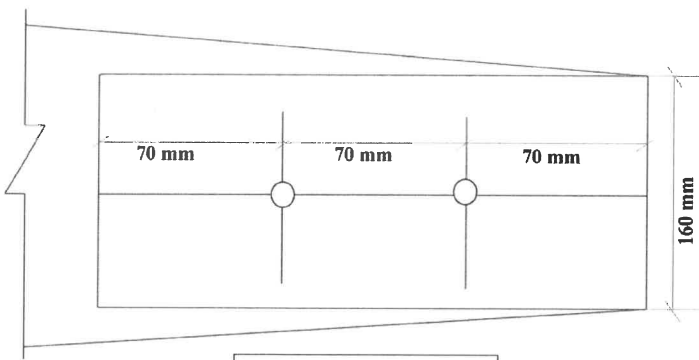
Total Marks: 180

Course Name: Building Technology II- Construction, 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.		
(A)	Explain the Terms: (Any SIX)	(12)
1	Steel Frame Construction	
2	Bracing	
3	Riveting	
4	Steel Girder	
5	Switch	
6	Ethernet cable	
7	Voltage	
8	Parallel Circuit	
(B)	Answer the following (Any THREE)	(18)
1	Enlist and sketch typical cross sections of steel components used as structural columns and beams.	
2	Explain the difference between steel truss and steel space frame with neat and illustrated diagram	
3	List all the types of steel used in building exteriors. Explain the Application of any one of them for architecture purposes structural purposes or functional purposes.	
4	Write Short note on "Container structures"	
Q.2.	Answer in Detail	(30)
	Explain steel roof construction with example. Take reference of any project that you have studied in detail. Elaborate upon following points:	
a)	Explain what is a typical steel roof construction, its advantages and challenges involved in the construction	5
b)	Schematic drawings of the project that you have taken for reference explaining functional layout	5
c)	Structural grid with location of various structural components in plan (with dimensions) and structural assembly with primary, secondary, tertiary layers	5
d)	Enlist the components/members used for the structure	5
e)	Covering materials and its fixing details	5
f)	Important connection (Joinery) details	5
Q.3.		
(A)	Answer the following (any TWO)	(10)
1.	What factors should be taken into consideration in selecting the types of lighting and light fixtures for a living room and bedroom.	
2.	Define type of circuit and explain which circuit is used in residences.	
3	Explain classification of cables based on: -Number Of Conductors in the Cable -Installation And Laying of the Cable	

(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)
Q.4.		
(A)	Do as directed. / Select the correct answer	(05)
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	The Rise of the Pitched roof truss is governed by, (a) Dead Load (b) Live Load (c) Wind Load (d) d) Earthquake load	
3	The pitch of tacking rivets, when double angles are connected back-to-back and acting as tension members should not be more than. (a) 500 mm (b) 600 mm (c) 1000 mm (d) 1100 mm	
4	Which Section is preferable for column design? (a) ISLB (b) ISJB (c) ISHB (d) ISMB	
5	For the columns of unsupported length L, with one end restrained in translation and rotation and the other end restrained in rotation but free to translate, the effective length will be, (a) 0.65L (b) 0.8 L (c) 1.2L (d) 1.5L	
4(B)	A Single plate tension member of 160 mm X 10 mm is connected to a 12 mm thick gusset plate at the ends with 2-12 mm diameter bolts to transfer tension as shown in Figure. Determine the design tensile strength of the plate; assuming that, the yield & ultimate stress of steel are 250 N/mm ² & 410 N/mm ² respectively.	(25)
	 All Dimensions are in mm	
	Attempt any three questions out of the following four: Q5, Q6, Q7, and Q8.	(60)

Q5	The ISHB 350 @ 71.2 Kg/m is used as a short column having a 3.6 m length, with one end restrained in translation and rotation and the other end restrained in rotation but free to translate. Calculate an axial load-carrying capacity. Take $f_y = 250 \text{ N/mm}^2$, $E = 2 \times 10^5 \text{ N/mm}^2$	
Q:6	Calculate the moment of resistance of a laterally restrained ISMB 600 @ 122.6 kg/m; simply supported beam, span 5.8 m, with UDL = 90 kN/m (including self-weight).	
Q:7	Design a slab-based footing for a column section ISHB 350 @ 72.4 Kg/m, subjected to a factored axial load 1500 KN. Take Bearing Capacity of soil = 210 KN/sqm, Grade of concrete = M-20, $f_y = 250 \text{ N/mm}^2$, $E = 2 \times 10^5 \text{ N/mm}^2$.	
Q:8	Sketch and label the following in detail.	
1)	Gusseted-based footing.	
2)	Beam-to-Beam Framed Connection	

