

SARVAJANIK UNIVERSITY

S-2026 Date: 06-05-26 Time: 09:30 AM to 12:30 PM

Regular / Backlog Exam

5

B. Architecture III - SEMESTER- VI EXAMINATION

Course Code: BRAR 12602

Total Marks: 180

Course Name: Building Technology IV (Advanced Construction, Structure & Services)

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Draw Illustrations, Sketches, Labelled Diagrams where ever applicable

Q1.	Answer the following (Compulsory) Attempt Any 16 (16 x 2)	
	As Directed -- State True or False / Fill in The Blanks	32 Marks
1	Velocity Of Sound in Bricks is 4300 meter Per Second (True/ False)	2 Marks
2	Plastic is a Good Acoustic Material (True/ False)	2 Marks
3	Sound Waves are Longitudinal in Nature (True/ False)	2 Marks
4	Concave Surfaces Help to Focus Sound (True/ False)	2 Marks
5	Hyperbolic Paraboloid shell structure is double curvature. (True/ False)	2 Marks
6	One Type Of Space Frame Structure is Lamella Dome. (True/ False)	2 Marks
7	Masts are not carrying tensions in Tensile Structure. (True/ False)	2 Marks
8	Continuity andAre Critical in shell structure Design. (True/ False)	
9	 Structure is Good For Static Load	2 Marks
10	Suspension cable structure can span more than cable stayed structure. (True / False)	2 Marks
11	Double layer two way grid is more stiff then double layer three way grid . (True/ False)	2 Marks
12	Double cable structure are used to decrease fluttering due to wind . (True / False)	2 Marks
13	High Pressure laminate used for building facades is a Derived Artificial material. (True / False)	2 Marks
14	GFRC Stands For Glass Reinforced	2 Marks
15	Castellated Structure is a Type Of Tensile Structure (True/ False)	2 Marks
16	R Value of R.C.C Wall should be minimum 4 Hours (True/ False)	2 Marks
17	Full Form Of NBC Is National By Laws and Code (True/ False)	2 Marks
18	GDCR is a Document which has Building By Laws for Site Provisions for Fire Safety also. (True/ False)	2 Marks
19	Float Glass and Wired Glass can be used for Curtain Wall (True/ False)	2 Marks
20	Light Weight Concrete Can be Used as Sound Insulating Material (True/ False)	2 Marks

Q.2	Explain In Brief With Sketches (20 + 20)	40 Marks
Q2 A	Explain following terms along with load transfer and sketches (Any two) 1. Cable Stayed Roof structure. (10 Marks) 2. Plate girder along with stiffeners . (10 Marks) 3. double layer two way space frame. (10 Marks)	20 Marks
Q2 B	Explain any one existing space frame structure explaining plan , section along with dimensions, load transfer , cross section & size of structural member, connection details etc.	20 Marks
Q.3.	Explain any THREE questions out of the Following (16 x 3 = 48)	48 Marks
i)	List the Classification of Shell Structures By Materials (4 Marks). Explain the Advantages and Disadvantages of the materials (4 Marks) Select any one material and Explain the Folded Plate Shell with it's Principal Of Component (8 Marks).	16Marks
ii)	List all the Types of Shell Form by their Curvature in Tabular or Schematic Form. (8 Marks) . Define the Doubly Curved Developable Shell. (4 Marks) with help of Labelled Sketches Explain the Doubly Curved Developable Shell (4 Marks) .	16 Marks
iii)	a) Write Down the Advantages Of Different Types Of Shell Structures (8 Marks) b) Explain Metal Roof decking with a neat sketch. Write down its Properties and Uses. Write only its types and draw sketches of it. (8 Marks)	16 Marks
iv)	What Are the Characteristics Of Cross Laminated Timber and Glue Laminated Timber.(8 Marks) Draw Neat Sketches to Explain (8 Marks)	16 Marks
	ATTEMPT ANY THREE OUT OF FOUR (20 x 3 = 60)	60 Marks
Q4) I)	Consider that You have to Design Acoustics for an Auditorium -	20 Marks
a)	Name all the Types Of Sound Insulating Materials and Explain their Application.	5 Marks
b)	What are the advantages Of Sound Insulating Material.	5 Marks
c)	Describe In Detail the Various Sound Insulating Materials.	10 Marks
Q4 II)	Consider a Small Room for 20 People of size 10m X 12mt X 4mt ht For Teaching Purposes.	20 Marks
a)	List all the Acoustical Considerations For the Same	5 Marks
b)	Draw the Plan With Dimensions	5 Marks
c)	Explain the Critical Distance in Context Of Volume Of Room and Reverberation Time in Detail.	10 Marks
Q4 III)	Consider An Atrium Of Area Of 64m X 50m X 100 M. With Help Of Illustrations And Labelled Diagram Design A Service Core With Following Features For Fire Safety	20 Marks
a)	A Layout Of Escape Route Of The Atrium Along With Position Of Sprinkler System, Smoke Detectors, Alarm System, Main Door And Openings For Windows / Ventilation System.	5 Marks

b)	Explain Why it is Important to have a service core for Fire Safety. Show Position Of Pressurized Staircase Cabin, Fire Lifts, Ducts For Services, Fire Door, Ventilation System.	5 Marks
c)	Which Material Should be used for Construction Of The Service Core For Fire Safety. Sketch The Width Of The Staircase And It's Landing, Height As Per NBC For Fire Safety.	10 Marks
Q4 IV)	A Thirteen Storied Building has a Basement Parking and 12 Floors and Terrace Area. • 1st Floor is Administration and Community Space • 2nd to 4th Floor are Game Zone and Food Court. • 5th to 7th is a Mall • 8 to 10th Floor are Office Spaces.	20 Marks
a)	Which Type Of Fire Fighting System will you provide Dry or Wet Riser. Give Reason.	5 Marks
b)	Design (draw and label diagram) Compartmentation For the Building.	5 Marks
c)	Draw The Provisions Of Both Active And Passive Fire Fighting System For The Same Through Plan And Elevation / Section Along With The Service Core. Label Diagram and Write Dimensions / Areas where ever applicable.	10 Marks