B.Arch-VI(R)-07-24-3304 Reg. No. | | | | | | | | |

A

B.Arch. Degree VI Semester Regular Examination July 2024

AR 1602 BUILDING MATERIALS AND CONSTRUCTION VI

(*2021 Scheme*)

Time: 4 Hours Maximum Marks: 100

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

I. Write short notes on the following

(a) Application of space frame structure.

(b) Flat grid and Spatial grids.

(c) Pre-stressed concrete.

(d) Freyssinet system.

(e) Advantages of Precast Concrete Products.

(f) Cast-in-situ Construction.

(g) Purpose of temporary structure.

(h) Joinery Techniques of temporary structure.

PART B

(4 × 10 = 40)

II. Sketch the types of space frame connections.

OR

III. Discuss in detail spatial grids.

IV. Define pre-tensioning and post-tensioning in the case of pre-stressed concrete.

OR

V. Explain various types / methods of post-tensioning.

VI. State the advantages and disadvantages of precast concrete members over cast in situ concrete.

OR

VII. State requirements of structural joints and their design considerations for prefabricated elements.

VIII. Discuss the types and functions of temporary structures.

OR

IX. Explain construction and joinery techniques with different materials used for temporary structure.

PART C

(1 × 20 = 20)

X. Draw to a suitable scale, plan elevations of a double-layer spatial grid structure for a structure with a span of 10 m × 20 m. Provide annotations explaining the types and materials used.

OR

XI. Design and detail an exhibition space of 5 m × 10 m with a temporary structure. Mark the necessary parts and draw any two-joinery detail.

***

B.Arch-VI(R)-07.24-3305 Reg. No. | | | | | | | | |

B

B.Arch. Degree VI Semester Regular Examination July 2024

AR 1603 HISTORY OF ARCHITECTURE VI – MODERN AND POST MODERN

(*2021 Scheme*)

(Illustrations in answers carry due marks)

Time: 3 Hours Maximum Marks: 100

PART A

(Answer ***ALL*** questions)

(8 × 5 = 40)

I. Write short notes on the following

(a) Principles of Modernism.

(b) Italian Futurism.

(c) Expressionism.

(d) Architectural style of Frank Owen Gehry.

(e) Impact of Louis Kahn on Indian architecture.

(f) Charles Correa.

(g) Planning of Bhubaneswar.

(h) Laurie Baker.

PART B

(4 × 15 = 60)

II. Analyze the impact of the Bauhaus School on modern architecture and design, emphasizing its interdisciplinary approach and key figures.

OR

III. Examine the architectural philosophy and key works of Louis Sullivan, highlighting his contributions to modern architecture.

IV. Explain the principles and philosophy of structuralism in architecture, providing examples of its application in modern design.

OR

V. Analyze the innovations and ideas introduced by Archigram, focusing on the contributions of Peter Cook and their impact on architectural design.

VI. Discuss the architectural significance of Chandigarh as influenced by Le Corbusier, including its design principles and impact on Indian architecture.

OR

VII. Explain the principles of deconstruction in architecture, discussing its significance and influence on modern design with examples of key works.

VIII. Discuss the contributions of B. V. Doshi to post-independent Indian architecture, focusing on his philosophy, notable projects and influence.

OR

IX. Analyze the architectural philosophy and notable works of Geoffrey Bawa, highlighting his contributions to sustainable and regional architecture.

***

B.Arch-VI(R)-07-24-3306 Reg. No. | | | | | | | | |

B

B.Arch. Degree VI Semester Regular Examination July 2024

AR 1604 THEORY OF STRUCTURES V- STEEL STRUCTURES

(2021 Scheme)

Time: 3 Hours Maximum Marks: 100

PART A
(Answer ***ALL*** questions)

(8 × 5 = 40)

I. Write short notes on:

(a) Sketch and briefly explain any three failure patterns of bolted connection.

(b) Briefly explain the types of welded connection with neat sketches.

(c) Explain block shear failure.

(d) Explain the failure modes of axially loaded columns.

(e) Distinguish between laterally restrained and unrestrained beams.

(f) Briefly explain the elements of gantry girder with a neat sketch.

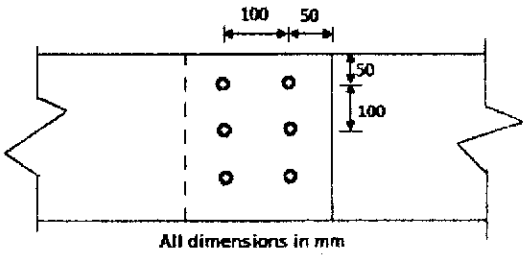
(g) Explain structural framing.

(h) What are the types of industrial floors?

PART B

(4 × 15 = 60)

II. Determine the strength and efficiency of a bolted lap joint shown in figure. The bolts are of 20 mm diameter, grade 4.6. The plates are of 12 mm thick and grade Fe 410.



OR

III. A tie member consisting of an angle section ISA 100 × 75 × 8, designed to transfer a factored axial load of 280 kN, is to be welded to a gusset plate of 10 mm thick, using a 6 mm fillet weld. Design the weld, if the weld is provided on three sides by overlapping the angle on the gusset plate, at a shop. Also sketch the connection showing the weld lengths.

(P.T.O.)

IV. An equal angle section 1m long, of a truss is connected to the gusset plate. It carries ultimate tension of 100 kN. Design the section using 6 mm weld. Assume fy = 250 MPa and fu = 410 MPa.

OR

V. Determine the design load capacity of the column ISHB 300@577 N/m if the length of the column is 3m and its both ends are hinged.

VI. Design a beam laterally supported to carry a load of 10 kN/m for an effective span of 4 m.

OR

VII. Explain the design procedure of a roof truss step by step.

VIII. Draw the layout of an industrial building and explain in detail.

OR

IX. Explain core structure and outrigger braced structures with neat sketch.

***

B.Arch-VI(R)-07.24-3307 Reg. No. | | | | | | | | |

B

B.Arch. Degree VI Semester Regular Examination July 2024

AR 1605 SOCIETY, ARCHITECTURE AND ENVIRONMENT

(2021 Scheme)

(Support your answers with proper illustrations and examples)

Time: 3 Hours Maximum Marks: 100

PART A

(Answer ***ALL*** questions)

(8 × 5 = 40)

I. Write short notes on:

(a) Society and its key characteristics.

(b) Differentiate between a community and a networked society.

(c) Social change and differentiate between traditional, transitional and modern societies.

(d) Social stratification and its relevance to architecture.

(e) Biophilia hypothesis.

(f) Environmental principles considered in architectural design.

(g) The role of parks and playgrounds in a community.

(h) Environmental perception and its impact on the experience of environments.

PART B

(4 × 15 = 60)

II. How do the concepts of family and social groups influence architectural design? Explain with relevant theories.

OR

III. Discuss the relationship between social systems and the built environment. Use examples to illustrate your points.

IV. Analyze the impact of social change on architectural styles throughout history. Provide specific examples.

OR

V. Discuss the role of cultural anthropology in understanding the relationship between society and the built environment.

VI. Discuss the specific challenges and opportunities Kerala's environmental conditions present for architects.

OR

VII. Analyze the traditional settlement patterns of Kerala and explain how they respond to the environment.

VIII. Discuss the social and psychological implications resulting from the planning of new towns. Provide examples of successful or problematic designs.

OR

IX. Analyze the relationship between patterns of activity and space utilization within a neighbourhood.

***

B.Arch-VI(R)-07.24-3308 Reg. No. | | | | | | | | |

C

B.Arch. Degree VI Semester Regular Examination July 2024

AR 1606 BUILDING SERVICES - III FIRE SAFETY, HVAC AND BUILDING AUTOMATION

(*2021 Scheme*)

Time: 3 Hours Maximum Marks: 100

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

I. (a) What is fire and how does fire spread?
(b) What is Combustibility of materials? How can we determine if a material is combustible or non-combustible?
(c) What is the critical thickness of insulation and how does it affect heat transfer?
(d) What are the three main methods of heat transfer? Explain with a diagram.
(e) Write short note on Air Conditioning? What are the main types of air conditioning systems based on their purpose and installation?
(f) What is the main difference between Vapour Compression and Vapour Absorption Systems? Explain with sketches.
(g) What is a Building Automation System (BAS) and what are its benefits?
(h) Explain the components of Building Automation System?

PART B

(4 × 15 = 60)

II. Explain the minimum requirement for firefighting system in a building and how it is classified. (15)

OR

III. (a) Explain the importance of Sprinkler System in a building. (7)
(b) What are the different types of sprinkler systems used in buildings? (8)

IV. An exterior wall of a house may be approximated by 10 cm layer of common brick (k = 0.75 W/m-deg) followed by 4 cm layer of gypsum plaster (k = 0.5 W/m-deg). What thickness of loosely packed rock wool insulation (k = 0.065 W/m-deg) should be added to reduce the heat loss or gain through the wall by 75%? (15)

OR

V. (a) Explain Fourier's Law of Heat Conduction and how do you derive the equation for conduction through a plane wall. (8)
(b) Define Insulation and properties of Insulation. (7)

VI. Explain All Air system with its classifications. Describe its advantages and disadvantages along with its application. (15)

OR

VII. (a) Explain the non-conventional Refrigeration System. (8)
(b) Explain any one Central Air Conditioning System with neat sketch. (7)

VIII. (a) Explain the impact of Building Automation System on Energy Efficiency. (8)
(b) Explain the current trend and innovation in Building Automation System. (7)

OR

IX. What are the design issues related to building automation and its effect on functional efficiency? (15)

***