B.Arch. Degree III Semester Supplementary Examination
November 2025

AR 1302 BUILDING MATERIALS AND CONSTRUCTION - II
(2014 Scheme)

Instructions:
(i)   One drawing sheet to be supplied.
(ii)   Assume suitable details and dimensions wherever necessary.
(iii) Illustrations in answer carry due mark.
(iv) Credit will be given for following standard architectural drafting and detailing conventions.

Time: 4 Hours   Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I.   Write short notes on the following:
(a)   Safe bearing capacity of soil.
(b)   Admixtures used in concrete.
(c)   Difference between shallow and deep foundations.
(d)   Staircase components – tread, riser, nosing and landing.
(e)   Handrails and balusters in staircase design.
(f)   Types of formworks.
(g)   Slump test.
(h)   Bulking of sand.

(2 × 10 = 20)

II.   What is cement mortar? Write about the proportion and use of cement mortar for brickwork and plastering.

OR

III.   Explain the procedure of determining Safe Bearing Capacity of soil using the Plate Load Test. Mention its advantages and limitations.

IV.   What is a one-way slab? How is it different from a two-way slab? Use a simple diagram to support your answer.

OR

V.   Describe the different types of concrete staircases based on geometry with simple labeled sketches.

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PART B

(2 × 20 = 40)

VI. Draw the plan and cross-section of an RCC combined footing for two columns placed 3 m apart. Show main reinforcement, distribution steel and dimensions. Assume any other necessary dimensions.

OR

VII. Draw the plan and section of an RCC one-way slab resting on beams. Show main and distribution reinforcement, slab thickness and beam position. Assume any other necessary dimensions.

VIII. Draw the plan and elevation of a quarter-turn RCC staircase for a floor-to-floor height of 3m to a reasonable scale. Assume any other necessary dimensions. Indicate number of steps, riser height, tread width and landing size.

OR

IX. Draw the plan and section of an open spiral RCC staircase for a floor-to-floor height of 3 m to a reasonable scale. Assume any other necessary dimensions. Indicate number of steps, riser height, tread width and landing size.

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AR 1303 HISTORY OF ARCHITECTURE- II
(2014 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I.   Write short notes on the following:
   (a)   Features of Orissan temples
   (b)   Kandariya Mahadeva Temple, Khajuraho
   (c)   Architectural features of Imperial style
   (d)   Architecture of the slave dynasty
   (e)   Stepped wells of Ahmedabad
   (f)   Gol Gumbaz
   (g)   Early Mughal style of architecture
   (h)   Tomb of Rabi Durrani

PART B

(4 × 15 = 60)

II.   Describe the main features of the Chola and Vijayanagara styles of Dravidian architecture.

OR

III.   Explain the characteristics of Indo-Aryan temple architecture with reference to Lingaraja, Konark and Modhera temples.

IV.   Explain the development of Islamic architecture in Delhi under the Slave and Khilji dynasty.

OR

V.   Illustrate and describe the architectural marvels of the Tughlaq dynasty with reference to Khirki Masjid, Tughlaqabad and Firoz Shah Kotla.

VI.   Describe the provincial style of Islamic architecture in Jaunpur and Bengal.

OR

VII.   Examine the main features of Deccan architecture, focusing on the Charminar at Hyderabad, Jami Masjid and Gol Gumbaz at Bijapur.

VIII.   Explain the architectural features and planning principles of Fatehpur Sikri, describing its major buildings and their spatial arrangement.

OR

IX.   Discuss the architectural contributions of Shah Jahan to the Mughal style with reference to the cities of Agra and Delhi.

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AR 1304 BUILDING CLIMATOLOGY
(2014 Scheme)

Time: 3 Hours

Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I.   Write short notes on the following (Illustrate all answers with sketches).

(a)   Understanding climate is important in architecture

(b)   Trade winds

(c)   Illustrate Azimuth angle, altitude and zenith

(d)   Driving rain

(e)   Effective Temperature

(f)   Human body – heat production mechanism

(g)   Passive cooling

(h)   Stack effect and its importance.

PART B

(4 × 15 = 60)

II.   Provide a detailed explanation of the global wind patterns. Discuss how air currents vary among the trade winds, westerlies and polar winds.

OR

III.   Describe the Earth's thermal balance and the processes involved in atmospheric heat transfer.

IV.   Enumerate the major climatic zones of around the world. Compare and illustrate the features between composite/monsoon climate and tropical upland climate.

OR

V.   What are the key elements of climate? Explain how these elements are quantified and how they are applied in the architectural design process.

VI.   What are thermal comfort indices? Explain ET CET monograms Bioclimatic Chart in detail.

OR

VII.   What do you mean by comfort zone? Explain in detail the body's heat exchange and how the human body adjusts to different climatic conditions.

VIII. Describe and explain the key design considerations for constructing shelters in a tropical climate, using Kerala's climate as a case study.

OR

IX.   Identify and explain five passive and five active design strategies used to achieve thermal comfort in tropical housing.

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AR 1305 ARCHITECTURAL GRAPHICS-II
(2014 Scheme)

(One A2 drawing sheet is to be supplied. Illustrate all answers with neat sketches)

Time: 4 Hours   Maximum Marks: 100

PART A
(Answer *ALL* questions)

(4× 5 = 20)

I.   Write short notes on the following:
- (a) Vector Graphics and Raster Images
- (b) Sciography
- (c) Symbols and signage
- (d) RGB and CMYK colour modes.

PART B

(2 × 40 = 80)

II.   Create a drawing and illustrate an urban cityscape using a two-point perspective. Demonstrate your proficiency in producing high-quality renderings.

OR

III.   Design a distinctive logo for a company specializing in the production of food items. Explain the concept of design in words. Draw the design in a 15 cm ×15cm square grid.

IV.   Create an interior of a living room using one-point perspective. Utilize pencil to render the drawing, incorporating light and shade effects.

OR

V.   Create a vibrant, multi-colored poster measuring approximately 20 × 30 cm that showcases the theme "Save Farmers, Save India".

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AR 1306 HUMANITIES
(2014 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I.   Write short notes on the following
- (a) Association and its characteristics.
- (b) Relevance of the study of sociology for architects.
- (c) The concept of Village Community.
- (d) The interrelationship between Man, Environment and Society.
- (e) Urban safety and security.
- (f) Modernization as a form of social change.
- (g) Urban Spatial Structure.
- (h) Social aspects of housing.

PART B

(4 × 15 = 60)

II.   Define Community. Explain the various elements that constitute a community and how the concept of community can be related to the design of housing or public spaces.

OR

III.   Discuss the primary concept of Groups. Explain the relevance of studying these concepts for architects, particularly in the design of various functional buildings.

IV.   Discuss the concept of unity and diversity in India and its reflection in the country's architectural history and built environment.

OR

V.   Elaborate on the complex relationship between Society, Architecture and Settlement Pattern of Kerala. Discuss how social customs and environment have shaped the built form in the region.

VI.   What is Social Stratification? Explain the concepts of Class and Caste as forms of social stratification. How do these concepts influence the architecture and spatial organization of human settlements?

OR

VII.   Define Urbanism and Urbanization. Discuss the disasters that affect urban areas and the architectural and planning strategies for their mitigation.

VIII.   Define Culture. Discuss the significant ways in which culture and architecture are interrelated. Give examples.

OR

IX.   What are Slums? Describe the major socio-economical and physical problems associated with slums and suggest a role for architects in addressing them.

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AR 1308 STRUCTURAL ANALYSIS-I
(2014 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer ALL questions)

(8 × 5 = 40)

I. (a) Write short note on theory of pure bending with assumptions.

(b) Derive the expression for total moment of resistance of flitched beams.

(c) Derive an expression for the shear stress at any point in a circular section of a beam, which is subjected to a shear force F.

(d) Define strength of shaft and torsional rigidity. Prove that the torsional rigidity is the torque required to produce a twist of one radian in a unit length of shaft.

(e) Find an expression for the slope and deflection at the supports of a simply supported beam, carrying a point load at the centre.

(f) What is the use of conjugate beam method over other methods?

(g) What are the assumptions made in the Euler's column theory?

(h) Define effective length and slenderness ratio of columns with formulae.

PART B

(4 × 15 = 60)

II. A beam is simply supported and carries a uniformly distributed load of 50 kN/m run over the whole span. The section of the beam is rectangular having depth as 600 mm. If the maximum stress in the material of the beam is $130 N/mm^2$ and moment of inertia of the section is $8 \times 10^8 mm^4$, find the span of the beam.

OR

III. A Flitched beam consists of a wooden joist 10 cm wide and 20 cm deep strengthened by two steel plates 10 mm thick and 20 cm deep on each side. If the maximum stress in the wooden joist is $7 N/mm^2$, find the corresponding maximum stress attained in steel. Find also the moment of resistance of the composite section. Take Young's modulus for steel is $2 \times 10^5 N/mm^2$ and for wood is $1 \times 10^4 N/mm^2$.

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IV.   An I-section has the following dimensions:
Flanges : 150 mm × 20 mm
Web   : 30 mm × 10 mm
The maximum shear stress developed in the beam is 16.8 N/mm^2. Find the shear force to which the beam is subjected.

OR

V.   A solid steel shaft has to transmit 80 kW at 300 rpm. Taking allowable shear stress as 80 N/mm^2, find suitable diameter for the shaft, if the maximum torque transmitted at each revolution exceeds the mean by 30%.

VI.   An overhanging beam ABC is loaded as shown below. Determine the deflection of the beam at point C. Take E = 2 × 10^5 N/mm^2 and I = 5 × 10^8 mm^4.
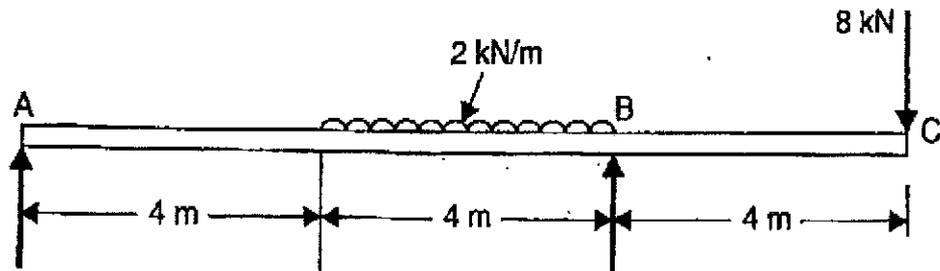
OR

VII.   A simply supported beam of length 8 m carries a uniformly distributed load of 1 kN/m run over the entire length. The beam is rigidly propped at the centre. Determine:
     (i)   reaction at the prop
     (ii)   reactions at the supports
     (iii)   net B.M at the centre
     (iv)   positions of points of contraflexures.

VIII.   A simply supported beam of length 5 metre is subjected to a UDL of 40 kN/m over the whole span and deflects 20 mm at the centre. Determine the crippling loads when this beam is used as a column with the conditions,
     (i)   one end fixed and other end hinged
     (ii)   both the ends pin jointed.

OR

IX.   A hollow cast iron column 300 mm outside diameter and 250 mm inside diameter, 9 m long has both ends fixed. It is subjected to an axial compressive load. Taking a factor of safety as 6,

$\sigma_c = 560 \, N/mm^2$, $a = \dfrac{1}{1600}$, determine the safe Rankine load.

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