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***B.Arch. Degree III Semester Regular/Supplementary Examination
November 2021***

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

Time: 4 Hours

Maximum Marks: 100

PART A
(Answer ALL questions)

(8 × 5 = 40)

- I. Write short notes on:
- Classification and behaviour of soil
 - Admixtures and reinforcement
 - One-way and two-way slab
 - Types of staircases
 - Detailing for staircases
 - Concrete walls and partitions
 - Tests for concrete
 - Methods of improving soil bearing capacity

(2 × 10 = 20)

- II. What are the different varieties of cement? What are the various tests for cement?

OR

- III. Briefly explain the concreting process. How is the surface of concrete finished?

- IV. With a diagram, define the parts of an RCC framed structure. Explain the role of walls and partitions within this structure.

OR

- V. Diagrammatically explain inclined slab, continuous and cantilever support conditions in staircases.

PART B

(2 × 20 = 40)

- VI. Draw the plan, section and reinforcement detail through the wall section of a casement window, having a concrete lintel and sunshade. The window is doubly-shuttered, 1500 mm wide and 1500 mm tall. Assume all necessary dimensions, and compose the sheet in 1:10 scale.

OR

- VII. Draw the plan and section of a pile foundation with single bulb for an RCC column. Assume all necessary dimensions, and compose the sheet in an appropriate scale.

- VIII. Draw the plan, section and reinforcement detail through a dog-legged staircase. The total height of the stairwell is 6000 mm, and the first landing acts as a mezzanine level. Assume all necessary dimensions, and compose the sheet in 1:20 scale.

OR

- IX. Draw the plan, section and railing detail through a straight staircase spanning a height of 3000 mm. The staircase has two intermediate landings, and the second intermediate landing acts as a mezzanine level. Assume all necessary dimensions, and compose the sheet in 1:10 scale.

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**B.Arch. Degree III Semester Regular/Supplementary Examination
November 2021**

**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:
- Lingaraja temple, Kanchipuram
 - Features of Orissan temples
 - Building types in Islamic architecture with examples
 - Architecture features of Imperial style
 - Teen Darwaza
 - Charminar
 - Humayun's Tomb
 - Tomb of Rabi Durrani.

PART B

(4 × 15 = 60)

- II. Explain the chola style of temple architecture with reference to the Brihadeswara temple at Tanjore.
- OR**
- III. Explain the architectural features of Khajuraho group of temples quoting Kandariya Mahadeva temple as an example.
- IV. Illustrate Qutub complex with neat sketches and describe architectural features of Qutub Minar in detail.
- OR**
- V. Illustrate with sketches, the architectural characteristics introduced by the Khilji dynasty and their contributions.
- VI. Explain the architectural features of Golgumbaz. Explain the method of intersection of arches with neat sketches.
- OR**
- VII. Give a comparative analysis of architectural composition and characteristics of Atala Masjid, Jaunpur and Jami Masjid, Jaunpur.
- VIII. Explain the city planning and spatial organization of Fatehpur Sikri and illustrate the architectural features of any building within the complex that portray Akbarian style of Architecture.
- OR**
- IX. Explain with sketches the spatial organization of Agra fort. Describe the contributions of Shah Jahan within the complex.

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***B.Arch. Degree III Semester Regular/Supplementary Examination
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AR 1304 BUILDING CLIMATOLOGY

(2014 Scheme)

Time: 3 Hours

Maximum Marks: 100

(All answers to be supported with relevant sketches)

PART A

(Answer ALL questions)

(8 × 5 = 40)

- I. Write short notes on the following:
- Importance of Climate in Architecture
 - Tilt of Earth's Axis and its Rotation
 - Factors which affect the Site climate
 - Subjective Variables that affect the thermal preferences of people
 - Effective Temperature (ET) and Corrected Effective Temperature (CET)
 - Body's Heat Production
 - Periodic heat flow
 - Stack effect in buildings.

PART B

(4 × 15 = 60)

- II. How does Earth's atmosphere maintain heat balance? Draw and explain the passage of radiation through the atmosphere and show how the earth's surface releases heat.

OR

- III. What are the causes of Global Wind patterns? Explain the major wind patterns and How does the Coriolis Effect affect this, globally?

- IV. Differentiate between Climate and Weather. Explain briefly the elements that shape the climate. Specify the units and the tool with which they are measured.

OR

- V. How does climate affect in house types in Kerala? What are the techniques used in Kerala Vernacular Architecture to prevent direct sunlight entering the rooms.

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

OR

- VII. What are the challenges in finding a scale for thermal comfort? Mention four indices that scale comfort. Also explain the use of Bioclimatic chart in building design.

- VIII. What is the difference between active and passive design techniques? What are passive design strategies for building? Explain in detail with neat sketches.

OR

- IX. Explain how the Form and Planning, Material selection, Ventilation and Air flow varies with change in different climatic region. Explain in detail the features of buildings in Hot - Dry desert climate with neat sketches.

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***B.Arch. Degree III Semester Regular/Supplementary Examination
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**AR 1305 ARCHITECTURAL GRAPHICS II
(2014 Scheme)**

Time: 4 Hours

Maximum Marks: 100

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

**PART A
(Answer ALL questions)**

(4 × 5 = 20)

- I. Write short notes on the following :
- Sciography.
 - Symbols and signage
 - Concept of Layers.
 - RGB and CMYK colour modes.

PART B

(2 × 40 = 80)

- II. Design a multi-coloured poster in A3 size (11 x 16 inch) for the campaign against 'Body shaming'.
- OR**
- III. Design a multi- coloured poster in A3 size (11 × 16 inch) for the campaign "**HealthyYouth for Healthy India**" organized by Ministry of Health, Government of India.
- IV. Draw a one point perspective bird's eye view of a city. Render in pencil with proper light and shade effect.
- OR**
- V. Draw a 3 point perspective ariel view composition of a city. Render in pencil with proper light and shade effect.

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***B.Arch. Degree III Semester Regular/Supplementary Examination
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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:
- Society prior to industrial revolution
 - Competition and conflict
 - Plurality of Indian society
 - Criteria for classifying an area as urban
 - Disaster and its mitigation
 - Causes of urban crime
 - Urban spatial structure
 - Culture

PART B

(4 × 15 = 60)

- II. Differentiate between Societies which existed prior to and after industrial revolution. How can this concept be extended to post Globalization?
OR
- III. Describe the concept of family and community in architecture. How could you relate it to architecture?
- IV. Characteristics of rural society and how it is different from urban centers.
OR
- V. 'Man, environment and society are interrelated to each other'-Discuss.
- VI. What is social change? What are the changes taking place in our society?
OR
- VII. How does settlement pattern aid urban crime? Give examples from recent incidents?
- VIII. What are slums? Describe the socio-economical and physical problems associated with slums.
OR
- IX. What is social structure? Explain the components and characteristics of social structure.

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**B.Arch. Degree III Semester Regular/Supplementary Examination
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**AR 1308 STRUCTURAL ANALYSIS - I
(2014 Scheme)**

Time: 3 Hours

Maximum Marks: 100

**PART A
(Answer ALL questions)**

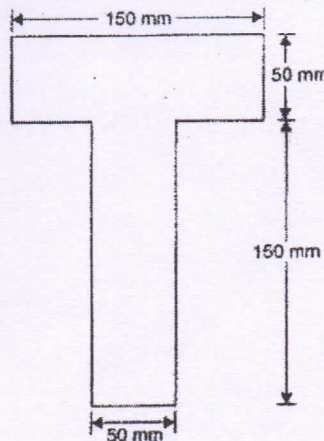
(8 × 5 = 40)

- I. (a) Explain the theory of simple bending. What are the assumptions made in the theory of simple bending?
- (b) What do you mean by section modulus? Find an expression for the section modulus for rectangular, circular and hollow circular section.
- (c) What is a composite beam? Explain in detail about bending in composite beam.
- (d) Prove that the maximum shear stress in a circular beam of a section is $4/3$ times the average shear stress.
- (e) Find the expression for slope at the supports of a simply supported beam, carrying a point load at centre.
- (f) What is Macaulay's method? Where is it used?
- (g) Explain the assumptions made in the Eulers column theory. How far are the assumptions valid in practice.
- (h) Explain how the failure of a short and of a long column will take place?

PART B

(4 × 15 = 60)

- II. A beam is of T section as shown in figure. The beam is simply supported over a span of 4 m and carries a uniformly distributed load of 1.7 kN/m run over the entire span. Determine the maximum tensile and maximum compressive stress.



OR

- III. A flitched beam consists of a wooden joist 150 mm wide and 300 mm deep strengthened by a steel plate 12 mm thick and 300 mm deep on either side of the joist. If the maximum stress in the wooden plate is 7 N/mm^2 , find the corresponding maximum shear stress attained in steel. Find the moment of resistance of the composite section. Take E for steel = $2 \times 10^5 \text{ N/mm}^2$ and for wood = $1 \times 10^4 \text{ N/mm}^2$.

(P.T.O.)

- IV. The shear force acting on a section of a beam is 100 kN. The section of the beam is of T shaped of dimensions 200 mm \times 250 mm \times 50mm. The flange thickness and web thickness are 50 mm. Find the shear stress at the neutral axis and the junction of the web and the flange.

OR

- V. A Beam of I section is having a overall depth as 500 mm and overall width as 190 mm. The thickness of the flange is 25 mm and the thickness of web is 15 mm. The moment of inertia about neutral axis is $6.45 \times 10^8 \text{ mm}^4$. If the section carries a shear force of 40 KN, Calculate the maximum shear stress. Also sketch the shear stress distribution across the cross section.

- VI. A simply supported beam of length 8 m length has 2 concentrated loads of 32 kN and 24 kN at 1 m and 4 m respectively from left support. Find the deflection under each load and the maximum deflection. Take $E = 200 \text{ GPa}$ and $I = 180 \times 10^8 \text{ mm}^4$.

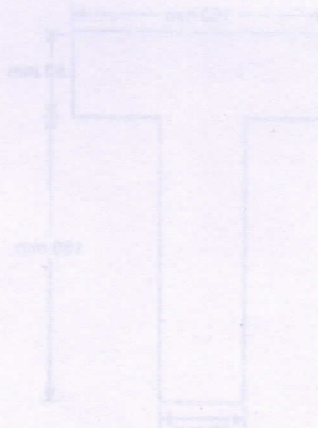
OR

- VII. A beam of length 6 m is simply supported at its ends and carries 2 point loads of 48 KN and at a distance of 1m and 3 m respectively from the left support. Find (i) The deflection under each load (ii) find the slope at the ends. Take $E = 200 \text{ GPa}$ and $I = 180 \times 10^8 \text{ mm}^4$.

- VIII. Derive the expression for the Euler's crippling load for a column with one end fixed and the other end is free. A solid round bar is 4 m long and 6 cm in diameter is used as a strut. Find the crippling load with (a) both ends hinged (b) one end is fixed and other end free.

OR

- IX. Determine the crippling load for an I section $30 \times 15 \times 2 \text{ cm}$ and 5 m long which is used as a column with both ends fixed. Take $E = 2 \times 10^5 \text{ N/mm}^2$. Also derive an expression for crippling load with both ends hinged.



OR

A Rigid beam consists of a wooden joist 150 mm wide and 300 mm deep strengthened by a steel plate 12 mm thick and 300 mm deep on either side of the joist. If the maximum stress in the wooden joist is 7 N/mm^2 , find the corresponding maximum shear stress in steel. Find the moment of resistance of the composite section. Take E for steel = $2 \times 10^5 \text{ N/mm}^2$ and for wood = $1 \times 10^4 \text{ N/mm}^2$.