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## ***B.Arch. Degree VI Semester Supplementary Examination May 2025***

### **AR 1602 BUILDING MATERIALS AND CONSTRUCTION-V (2014 Scheme)**

Time: 4 Hours

Maximum Marks: 100

**Instructions:**

- (i) *Drawing sheets to be supplied*
- (ii) *Assume suitable details and dimensions wherever necessary*
- (iii) *Illustrations in answer carry due mark.*

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

(8 × 5 = 40)

- I. Write short notes on the following:
  - (a) Construction systems developed by CBRI.
  - (b) Properties and applications of ferrocement in building construction.
  - (c) Curtain wall glazing and its application.
  - (d) Thermoplastics and its use in architecture.
  - (e) Materials used in false ceilings.
  - (f) Fixing details for concealed lighting in false ceilings.
  - (g) Diagonal framing.
  - (h) Reinforcement details in R.C. Band for earthquake resistance.

(2 × 10 = 20)

- II. Describe the innovative floor, wall and roofing systems developed through research organizations such as CBRI and SERC.

**OR**

- III. Discuss the preparation, properties and applications of ferrocement in building construction.

- IV. Explain the composition, types and uses of glass in the building industry, including current developments in structural glazing and curtain wall glazing.

**OR**

- V. Discuss the properties and architectural uses of plastics in detail.

#### **PART B**

(2 × 20 = 40)

- VI. An air conditioned studio space of size 4 × 4 m uses false ceiling with Al sections and details. Prepare an appropriate drawing in suitable scale to explain the details.

**OR**

- VII. Draw to a suitable scale the detailed plan, elevation and section of a wall paneling system using timber. Include fixing details and any additional features available in the local market.

- VIII. Draw to a suitable scale the detailed reinforcement and bending details in an R.C. Band for an earthquake-resistant structure.

**OR**

- IX. Draw to a suitable scale the detailed plan and section of a building with vertical steel bars in brick masonry for earthquake resistance. Include necessary reinforcement details.

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***B.Arch. Degree VI Semester Supplementary Examination May 2025*****AR 1603 HISTORY OF ARCHITECTURE-V**  
***(2014 Scheme)***

Time: 3 Hours

Maximum Marks: 100

*(Use illustration wherever required. Illustrations carry due marks.)***PART A**(Answer **ALL** questions)

(8 × 5 = 40)

- I. Write short notes on the following:
- (a) "Form follows Function"
  - (b) Bauhaus School
  - (c) Deconstructivism
  - (d) Geoffrey Bawa's works
  - (e) Plug in City
  - (f) Pompidou Centre
  - (g) Louis Kahn's work in India
  - (h) Asian Games Village by Raj Rewal.

**PART B**

(4 × 15 = 60)

- II. Explain the influence of Taliesin School and Chicago school in modern architecture.

**OR**

- III. Describe the works of Walter Gropius and Mies Vander Rohe.

- IV. Explain the works of Alvar Aalto and explain how does Saynatsalo Town hall display characteristics of Critical Regionalism.

**OR**

- V. What is Expressionism in Architecture? Explain with reference to Expressionist architects' works, especially Erich Mendelsohn.

- VI. What were the thoughts and ideas of Robert Venturi that led to Post Modernism?

**OR**

- VII. Describe the works of Zaha Hadid and Frank Gehry.

- VIII. Explain the works of Le Corbusier in India.

**OR**

- IX. Describe the works of Laurie Baker and B V Doshi.

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***B.Arch. Degree VI Semester Supplementary Examination  
May 2025***

**AR 1604 TOWN PLANNING  
(2014 Scheme)**

Time: 3 Hours

Maximum Marks: 100

**PART A  
(Answer ALL questions)**

(8 × 5 = 40)

- I. (a) Describe the importance of forum in Roman city life.
- (b) Briefly describe industrial cities.
- (c) Write short notes on Ekistics.
- (d) Explain Radiant city.
- (e) Write short notes on Perspective Plan.
- (f) Briefly describe the surveys conducted for plan preparation.
- (g) Write short notes on JNNURM.
- (h) Briefly describe SEZ.

**PART B**

(4 × 15 = 60)

- II. Compare and contrast the town planning principles of ancient Greece and Rome.
- OR**
- III. Explain the town planning during Mesopotamia Civilization.
- IV. Explain garden city movement with the case example of a city.
- OR**
- V. Explain the following terms with neat sketches
  - (i) Central Business District
  - (ii) Suburb
  - (iii) Fringe
  - (iv) Periphery
  - (v) Urban Nodes.
- VI. Describe development plan, objectives and its components in detail.
- OR**
- VII. What is land use in town planning? Explain the following land development techniques with neat sketches
  - (i) Land Pooling.
  - (ii) Transfer of Development Rights (TDR).
- VIII. Explain 74<sup>th</sup> Amendment. What are the functions and powers of District Planning Committee as per Kerala Town and Country Planning Act, 2016?
- OR**
- IX. What is the Coastal Regulation Zone (CRZ)? Explain the classifications of CRZ areas and their restrictions.

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## ***B.Arch. Degree VI Semester Supplementary Examination May 2025***

### **AR 1605 BUILDING SERVICES - III (FIRE PROTECTION AND HVAC) (2014 Scheme)**

Time: 3 Hours

Maximum Marks: 100

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

(8 × 5 = 40)

- I. (a) What are the properties of Insulation?
- (b) Write short note on Fourier law of heat Conduction.
- (c) Write short notes on Refrigerants.
- (d) What is a heat pump?
- (e) Write short notes on Psychometric.
- (f) What is the difference between Dry Bulb Temperature and Wet Bulb Temperature.
- (g) Write short notes on Fire lifts
- (h) Write few points on design consideration for fire exits.

#### **PART B**

(4 × 15 = 60)

- II. What are the principles of Heat Transfer? Explain in detail with examples. (15)

**OR**

- III. A furnace wall consist of 230 mm layer of refractory bricks, 0.8 mm layer of steel plate and a 110 mm layer of insulating bricks, on the furnace side maximum temperature is 1400°C and minimum temperature is 22°C on the outer side of the wall. The head loss from the wall is 350 w/m<sup>2</sup>. There is a thin layer of air between the refractory brick and steel plate. Thermal conductivity for three layers is 1.4, 42 and 0.13 w/m°C respectively. What is the temperature of the outer surface of the plate. (15)

- IV. Differentiate between comfort and industrial air conditioning. (15)

**OR**

- V. Explain in detail Vapour compression system. (15)

- VI. Explain the Air Distribution system, with the help of a diagram. (15)

**OR**

- VII. Differentiate between Central plant and Split Air-conditioning. Explain their advantages and disadvantages. (15)

- VIII. Explain

- (i) Principles of Fire Protection (9)
- (ii) Automatic Sprinklers (6)

**OR**

- IX. Draw a fire safety layout for a 10 storied apartment building; including position and size of fire ducts, placement of fire exits, position of fire lifts. (15)

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***B.Arch. Degree VI Semester Supplementary Examination  
May 2025***

**AR 1604 TOWN PLANNING  
(2014 Scheme)**

Time: 3 Hours

Maximum Marks: 100

**PART A  
(Answer ALL questions)**

(8 × 5 = 40)

- I. (a) Describe the importance of forum in Roman city life.  
 (b) Briefly describe industrial cities.  
 (c) Write short notes on Ekistics.  
 (d) Explain Radiant city.  
 (e) Write short notes on Perspective Plan.  
 (f) Briefly describe the surveys conducted for plan preparation.  
 (g) Write short notes on JNNURM.  
 (h) Briefly describe SEZ.

**PART B**

(4 × 15 = 60)

- II. Compare and contrast the town planning principles of ancient Greece and Rome.  
 OR  
 III. Explain the town planning during Mesopotamia Civilization.  
 IV. Explain garden city movement with the case example of a city.  
 OR  
 V. Explain the following terms with neat sketches  
 (i) Central Business District  
 (ii) Suburb  
 (iii) Fringe  
 (iv) Periphery  
 (v) Urban Nodes.  
 VI. Describe development plan, objectives and its components in detail.  
 OR  
 VII. What is land use in town planning? Explain the following land development techniques with neat sketches  
 (i) Land Pooling.  
 (ii) Transfer of Development Rights (TDR).  
 VIII. Explain 74<sup>th</sup> Amendment. What are the functions and powers of District Planning Committee as per Kerala Town and Country Planning Act, 2016?  
 OR  
 IX. What is the Coastal Regulation Zone (CRZ)? Explain the classifications of CRZ areas and their restrictions.

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## ***B.Arch. Degree VI Semester Supplementary Examination May 2025***

### **AR 1605 BUILDING SERVICES - III (FIRE PROTECTION AND HVAC) (2014 Scheme)**

Time: 3 Hours

Maximum Marks: 100

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

(8 × 5 = 40)

- I. (a) What are the properties of Insulation?
- (b) Write short note on Fourier law of heat Conduction.
- (c) Write short notes on Refrigerants.
- (d) What is a heat pump?
- (e) Write short notes on Psychometric.
- (f) What is the difference between Dry Bulb Temperature and Wet Bulb Temperature.
- (g) Write short notes on Fire lifts
- (h) Write few points on design consideration for fire exits.

#### **PART B**

(4 × 15 = 60)

- II. What are the principles of Heat Transfer? Explain in detail with examples. (15)

**OR**

- III. A furnace wall consist of 230 mm layer of refractory bricks, 0.8 mm layer of steel plate and a 110 mm layer of insulating bricks, on the furnace side maximum temperature is 1400°C and minimum temperature is 22°C on the outer side of the wall. The head loss from the wall is 350 w/m<sup>2</sup>. There is a thin layer of air between the refractory brick and steel plate. Thermal conductivity for three layers is 1.4, 42 and 0.13 w/m°C respectively. What is the temperature of the outer surface of the plate. (15)

- IV. Differentiate between comfort and industrial air conditioning. (15)

**OR**

- V. Explain in detail Vapour compression system. (15)

- VI. Explain the Air Distribution system, with the help of a diagram. (15)

**OR**

- VII. Differentiate between Central plant and Split Air-conditioning. Explain their advantages and disadvantages. (15)

- VIII. Explain

- (i) Principles of Fire Protection (9)
- (ii) Automatic Sprinklers (6)

**OR**

- IX. Draw a fire safety layout for a 10 storied apartment building; including position and size of fire ducts, placement of fire exits, position of fire lifts. (15)

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**B.Arch. Degree VI Semester Supplementary Examination  
May 2025**

**AR 1606 STRUCTURAL DESIGN  
(2014 Scheme)**

Time: 3 Hours

Maximum Marks: 100

*(Codes IS456, SP16 charts, and calculators are permitted)*

**PART A  
(Answer ALL questions)**

(8 × 5 = 40)

- I. (a) List down the assumptions of limit state of collapse.  
(b) Define the design considerations of shear and deflection of beams as per IS456.  
(c) Explain the design procedure of T beam step by step according to IS456.  
(d) Differentiate between one way slab and two way slab.  
(e) Give any two situations where a two way slab is suggested.  
(f) Explain the classification of columns based on slenderness ratio.  
(g) Explain the types of footings with neat sketches.  
(h) Give a note on the structural behaviour of Long columns.

**PART B**

(4 × 15 = 60)

- II. Design a singly reinforced concrete beam having an effective span of 3 m having support width 230 mm carrying 4.5 kN/m live load. Assume M20 grade concrete and Fe415 grade steel.
- OR**
- III. Design a reinforced concrete beam having width 300 mm and overall depth restricted to 650 mm. The effective span of beam is 6 m. Assume the live load as 25 kN/m. Consider M20 grade concrete and Fe415 grade steel.
- IV. For a T beam with flange dimensions 1100 mm wide and 120 mm deep and web dimensions 600 mm deep and 250 mm wide, Find the area of steel required for an ultimate moment of resistance of 380 kNm. Assume M20 grade concrete and Fe415 grade steel.
- OR**
- V. Design an RCC slab for a floor having clear dimensions 4 m × 10 m with 230 mm support walls all around. Assume simply supported condition for the slab. Adopt M25 grade concrete and Fe415 grade steel.

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- VI. Design the reinforcement detailing of a square column of dimension 200 mm subjected to a design axial load of 1000 kN. Adopt M20 grade concrete and Fe415 grade steel.

OR

- VII. Design an RCC slab for an office floor of size 4 m × 5 m with all edges discontinuous and simply supported with corners prevented from lifting, to support a live load of 4.5 kN/m<sup>2</sup>. Adopt M20 grade concrete and Fe415 grade steel.

- VIII. Design the detailing of a rectangular reinforced concrete column of 200 mm × 150 mm subjected to a design load of 1200 kN and a moment of 180 kNm with respect to major axis. Adopt M20 grade concrete and Fe415 grade steel.

OR

- IX. A reinforced concrete square column 500 mm supports an axial design load of 1800 kN. The safe bearing capacity of soil at site is 250 kN/m<sup>2</sup>. Adopting M20 grade concrete and Fe415 grade steel, design a suitable footing for the column and sketch the details of reinforcements.

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