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***B.Arch. Degree V Semester Special Supplementary Examination  
October 2024***

**AR 1502 BUILDING MATERIALS AND CONSTRUCTION - IV  
(2014 Scheme)**

Time: 4 Hours

Maximum Marks: 100

**PART A**

(8 × 5 = 40)

- I. Write short notes on the following
- (a) Application of paint in new wood surfaces.
  - (b) Fire retardant paints.
  - (c) Mosaic tiles.
  - (d) Properties of Galvanized iron sheets.
  - (e) North light trusses.
  - (f) Corrugated aluminium sheets.
  - (g) Queen post truss.
  - (h) Dumb waiter.

**PART B**

(2 × 10 = 20)

- II. Write the uses and properties of plastic emulsions paints and cement based paints. Mention the defects in painting.
- OR**
- III. Discuss the type of floor finish you will recommend in the following cases. State the properties and advantages of the same
- (i) Toilet
  - (ii) Car parking area.
- IV. List the properties and advantages of polycarbonate, acrylic and bituminous sheets.
- OR**
- V. Define an elevator and list its types. What are the planning considerations of elevators for physically challenged?

**PART C**

(2 × 20 = 40)

- VI. Sketch the plan of a queen post truss with 9.1 m span and 5.4 m height. Illustrate the connection details between the queen posts and tie beams. Draw the elevation of a queen post truss with 12.1 m span and 6 m height.
- OR**
- VII. Draw to a suitable scale of steel angular truss roof with fixing details for an effective span of 6.5 m and name its different parts. Draw the detailed drawing of any two connections.
- VIII. Explain with a schematic section the different components of an elevator. Design and draw the plan, section and details of a 10 passenger elevator for a commercial building with a floor to floor height of 4.2 meters.
- OR**
- IX. Draw the plan, section and details of a 35 degree escalator to connect three floors in a department store, with a floor height of 5.0 meters.

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**AR 1503 HISTORY OF ARCHITECTURE-IV  
(2014 Scheme)**

Time: 3 Hours

Maximum Marks: 100

**PART A  
(Answer ALL questions)**

(8 × 5 = 40)

- I. Write short notes on the following:
- Bom Jesus Cathedral, Goa.
  - Goan-Portuguese villas.
  - Contributions of Edwin Lutyens.
  - Rashtrapathi Bhavan, New Delhi.
  - Impact of industrial revolution in architecture.
  - Use of modern building materials in Crystal Palace.
  - Eiffel Tower.
  - Art and crafts movement.

**PART B**

(4 × 15 = 60)

- II. Discuss how did the Portuguese blend their European design principles with local traditions and what are the lasting influences seen in religious and residential architecture in Goa?

**OR**

- III. Explain the evolution and characteristics of Portuguese Colonial Architecture. Discuss the architectural features of fontainhas.

- IV. Examine the characteristics of Indo-Saracenic architecture, with an example of significant building constructed in this style during British rule in India, highlighting how it blended elements of Indian, Islamic and European styles.

**OR**

- V. Discuss the key characteristics of British colonial architecture in India, using Edwin Lutyens' design and planning of New Delhi as an example.

- VI. Discuss the causes and consequences of the Industrial Revolution and explain how it influenced the architectural styles with an example.

**OR**

- VII. Discuss the technological advancements, the rise of new materials and their impact on the design and construction of buildings during the 19<sup>th</sup> century by providing specific examples of industrial architecture.

- VIII. Examine the architectural contributions of Joseph Paxton and Antonio Gaudi, highlighting their significant works and their influence on architectural design.

**OR**

- IX. Discuss the architectural philosophies of Victor Horta and Louis Sullivan, emphasizing their notable works.

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**AR 1505 BUILDING SERVICES II – ELECTRICAL DESIGN AND ILLUMINATION  
(2014 Scheme)**

Time: 3 Hours

Maximum Marks: 100

**PART A  
(Answer ALL questions)**

(8 × 5 = 40)

- I. (a) Differentiate between single-phase and three-phase systems.
- (b) What is the necessity of an Emergency Power Supply System?
- (c) Explain the working of MCB.
- (d) What are the classification of voltages in the electrical system?
- (e) Explain the terms
  - (i) Luminous Intensity.
  - (ii) Colour Rendering Index.
- (f) Discuss IBMS systems.
- (g) What are the key components of a lightning protection system?
- (h) What is the necessity of earthing?

**PART B**

(4 × 15 = 60)

- II. Derive the relationship between line voltage and phase voltage in a star-connected system.
- OR**
- III. Three resistances 40 Ω each are delta connected to a 400 V, 3 φ system. Determine the
    - (i) phase currents.
    - (ii) line currents.
    - (iii) total power consumed by the load.
  - IV. What is a substation? Draw the layout of a substation and briefly explain.
- OR**
- V. Explain the construction and working principle of a transformer with a neat diagram.
  - VI. Design an illumination scheme for a drawing hall with seating capacity of 70 with estimation.
- OR**
- VII. What are the different types of luminaries used in commercial buildings?
  - VIII. Discuss the various types of Earthing used for safety with neat diagrams.
- OR**
- IX. Discuss the safety regulation in domestic, commercial and high rise buildings.

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***B.Arch. Degree V Semester Special Supplementary Examination  
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**AR 1506 ARCHITECTURAL DETAILING  
(2014 Scheme)**

Time: 4 Hours

Maximum Marks: 100

- (i) Drawing sheets will be provided.  
(ii) Assume further data, if found necessary.

**PART A  
(Answer ALL questions)**

(8 × 5 = 40)

- I. Write short notes on:
- Landscaping Plan checklist.
  - Site plan and grading plan.
  - Elements in a foundation plan.
  - Reflected ceiling plan and roof plan.
  - Centre line drawing.
  - Types of detailing drawings for interiors.
  - Rainwater harvesting in a residence.
  - Sewage treatment plant details.

**PART B**

(3 × 20 = 60)

- II. Draw the Centre line plan in scale of 1:50 of the residence in figure 1 with proper labels and details.
- OR**
- III. Draw a basic foundation plan of Random Rubble Masonry for the residence in figure 1, including proper detailing in a 1:50 scale.
- IV. Prepare an electrical layout for the residence in figure 1 including fixing details of electrical fixtures.
- OR**
- V. Prepare a schedule of doors, windows and ventilator details for the residence in figure 1 including the plan with proper annotations in scale 1:50.
- VI. Draw a neatly drafted detailed plumbing section of the bathroom from figure 1 showing the detailed plumbing layout.
- OR**
- VII. Draw a neatly drafted detailed plumbing layout of the residence in figure 1 as a plan including all the details required.

(P.T.O.)

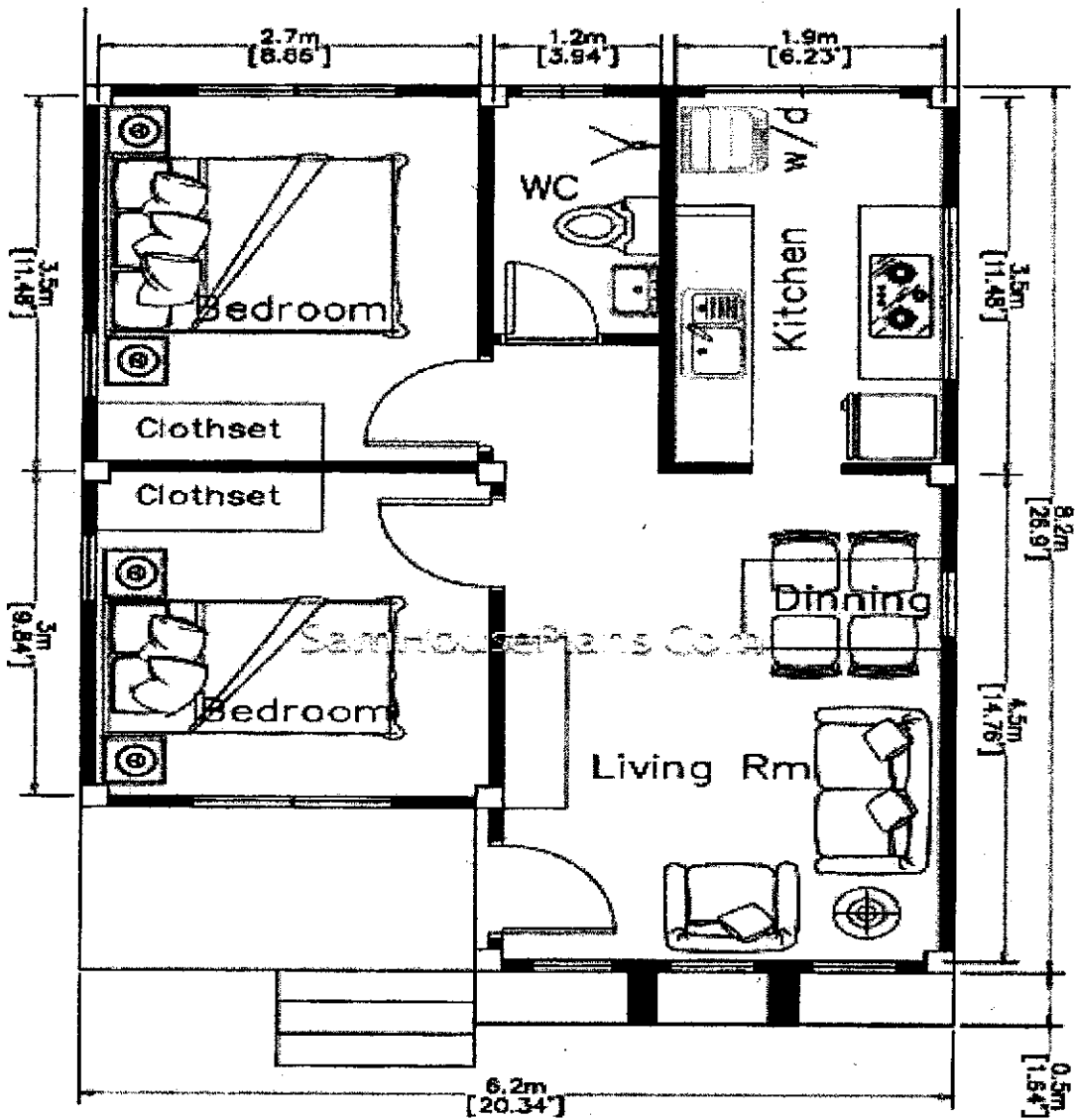


Figure 1

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October 2024***

**AR 1507 STRUCTURAL ANALYSIS-III  
(2014 Scheme)**

Time: 3 Hours

Maximum Marks: 100

**PART A  
(Answer ALL questions)**

(8 × 5 = 40)

- I. (a) A three – hinged arch of span  $l$  and rise  $h$  carries uniformly distributed loads of  $w$  per unit run over the whole span. Show that the horizontal thrust at each support is  $wl^2/8h$ .
- (b) A symmetrical three hinged semi-circular arch carries a point load of 100 kN at the crown hinge. The radius of the arch is 4 m. Find the horizontal thrust at the supports.
- (c) What are the advantages of arches over beams?
- (d) Discuss the effect of settlement of supports on internal forces in structures.
- (e) Discuss the difference between guide pulley support and saddle support used for passing the cable of a suspension bridge on a supporting tower.
- (f) A cable carrying a load of 10 kN/m run of horizontal span, is stretched between supports 100 m apart. The supports are at the same level and the central dip is 8 m. Find the maximum and the minimum tension in the cable.
- (g) Explain the force method of analysis of continuous beams.
- (h) Write the steps in Stiffness matrix.

**PART B**

(3 × 20 = 60)

- II. A three hinged circular arch has a span of 20 m between hinged supports at the same level and rise of 4 m to its centre where there is a hinge. It carries a udl of 30 kN/m over the left half of the span. Calculate the bending moment at the left quarter span and maximum bending moment on right half of the span.

**OR**

- III. A three hinged parabolic arch hinged at supports and at the crown have a span of 24 m and a central rise of 4 m. It carries a concentrated load of 75 kN at 18 m from the left support and uniformly distributed load of 45 kN/m over the left half of the span. Determine bending moment, normal thrust and radial shear at a section 6 m from the left support.

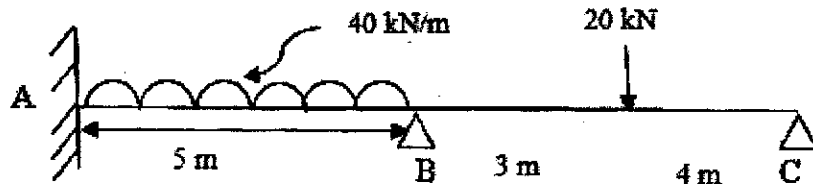
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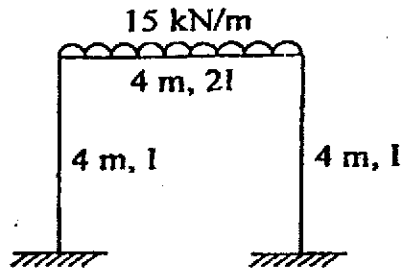
- IV. A cable of span 80 m (horizontal) has its ends at heights 7 m and 12 m above the lowest point of the cable. It carries a uniformly distributed load of 10 kN/m over the horizontal span. Determine the support reaction and maximum tension in the cable.

OR

- V. Analyse the beam using force method of analysis. Draw its shear force and bending moment diagram.

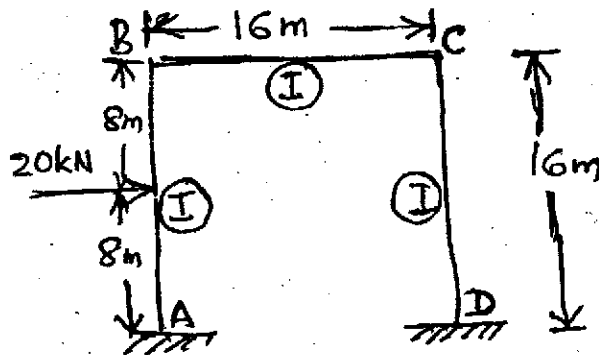


- VI. Using displacement method of analysis, analyse the frame shown in figure and draw the bending moment diagram.



OR

- VII. Analyse the frame shown in figure using displacement method of analysis.



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