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B.Arch. Degree III Semester Examination December 2015**AR 1302 BUILDING MATERIALS AND CONSTRUCTION II**

Time : 4 Hours

Maximum Marks : 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I. Write short notes on the following.

- (a) Physical properties of soil.
- (b) Tests for cement mortar
- (c) Properties of cement.
- (d) Admixtures for cement concrete.
- (e) Framed RCC buildings.
- (f) Design of one way and two ways RCC slab.
- (g) Building rules for the design of staircases.
- (h) Supporting systems for staircases.

II. Explain the methods of improving the bearing capacity of soils. (10)

OR

III. Describe various types of cements used for building construction highlighting its properties and applications. (10)

IV. Explain with sketches various types of shallow foundations used for building constructions. (10)

OR

V. What are the various types of RCC staircases, describing their design aspects? (10)

PART B

VI. Draw to a scale of 1:50 or any appropriate scale, detailed plan and section of an isolated footing for columns of an RCC framed building. Draw up to plinth level only. Assume necessary details required for drawing. (20)

OR

VII. Draw to a scale of 1:50 or any appropriate scale, detailed plan and section of deep pile foundation for RCC columns of an auditorium. Draw up to plinth level only. Assume necessary details required for drawing. (20)

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VIII. Draw to a scale of 1:50 or any appropriate scale, detailed plan and section of a bifurcated RCC staircase for a three storeyed educational building. Floor height 375 cm. Width of the first flight 300cm. Draw up to first floor level only. Assume necessary details required for drawing. (20)

OR

IX. Draw to a scale of 1:50 or any appropriate scale, detailed plan and section of a curved RCC staircase for the double height entrance lobby of a luxury residence. Floor height 330 cm. Draw up to first floor level only. Assume necessary details required for drawing. (20)

PART B

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B. Arch. Degree III Semester Examination December 2015

AR 1303 HISTORY OF ARCHITECTURE II

Time: 3 Hours

Maximum Marks: 100

(Illustrate all answers with neat sketches)

PART A

(Answer ALL questions)

(8 × 5 = 40)

I. Write short notes on the following:

- Lingaraja Temple.
- Sun Temple, Modhera.
- Sketch view of a typical Indian Mosque Complex labelling its essential parts.
- Features of Tuglaq Architecture.
- Provincial style Islamic Architecture of Bengal.
- Hawa Mahal.
- Red Fort, Delhi.
- Akbar's Tomb, Sikandra.

PART B

(4 × 15 = 60)

II. Illustrate with sketches, the architectural character of Khajuraho group of temples quoting Khandariya Mahadeva Temple as an example.

OR

III. Explain the difference seen in the Vijayanagara style and Chola style of architecture with examples.

IV. Illustrate with sketches the contribution of Sayyid and Lodhi dynasties in the evolution of Islamic Architecture in India with examples.

OR

V. Draw a neat sketch of Qutub Complex highlighting the contributions of various rulers and illustrate Qutub Minar in detail.

VI. Describe the salient architectural features of the Gujarat provincial style of Islamic architecture.

OR

VII. Explain the architectural features of Golgumbaz. Explain the method of intersection of arches with neat sketches.

VIII. Give a comparative analysis of the architectural composition and spatial planning of Humayun's Tomb and Taj Mahal.

OR

IX. Explain with sketches the city planning and spatial organisation of Fetehpur Sikri and illustrate architectural features of any building within the complex that portray Akbarian style of architecture.

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AR 1304 BUILDING CLIMATOLOGY

Time: 3 Hours

Maximum Marks: 100

(Illustrate all answers with sketches wherever necessary)

PART A

(Answer ALL questions)

(8 × 5 = 40)

- I. Write short notes on the following:
- (a) Tilt of Earth's axis and its effect on solar radiation.
 - (b) Sun path diagram and its applications.
 - (c) What are the factors causing deviation in Urban climate?
 - (d) Explain driving rain and driving rain index.
 - (e) Sol-air temperature and Solar gain factor.
 - (f) Olgay's Bioclimatic chart.
 - (g) Stack effect in buildings.
 - (h) Briefly explain the factors that reduce the solar heat gain through windows.

PART B

(4 × 15 = 60)

- II. Explain how the following climatic parameters are measured and data represented (i) Air temperature (ii) Humidity (iii) Solar radiation.
- OR**
- III. Explain global wind pattern.
- IV. What is meant by 'micro climate'? Briefly explain the various factors that influence the site climate.
- OR**
- V. Explain the characteristics of any two global climatic zones.
- VI. What is meant by thermal comfort? Briefly explain the various climatic and subjective variables that influence the thermal comfort of a person.
- OR**
- VII. Briefly explain the various thermal comfort indices and its uses in climatic design.
- VIII. What are the passive building design techniques for thermal comfort in a built environment? Explain.
- OR**
- IX. Explain the general design guidelines that make a built form appropriate to warm humid region with heavy rainfall.

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B.Arch. Degree III Semester Examination December 2015

AR 1305 ARCHITECTURAL GRAPHICS – II

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 :

- (a) Describe perspective projection concepts.
- (b) What is the difference between one point perspective and two point perspective?
- (c) Explain vector graphic with example.
- (d) Describe corporate design.

PART B

(2 × 40 = 80)

II. Make a composition of a long bridge across the river. It has twenty light posts on each side. At the bank of river we can see a town (use one point perspective)

OR

- III. (a) What do you mean by perspective drawing?
(b) With suitable sketches explain the process of perspective projection of buildings and landscapes.

IV. Compose a sculpture for shallow relief in the theme of "World peace" using any two colors and white.

OR

V. Design a poster for an event of your choice and explain the salient features incorporated in this design.

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AR 1306 HUMANITIES

Time: 3 Hours

Maximum Marks: 100

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

- I. Write short notes on the following:
- Concept of institution.
 - Benefits of association.
 - Plurality of Indian society.
 - Traditional settlement pattern of Kerala.
 - Social stratification in modern India.
 - Causes of urban crime.
 - Cultural anthropology.
 - Effect of housing on society.

PART B

(4 × 15 = 60)

- II. Outline the transformation of society from pre historic to information times. What was the impact of transformation on architecture during the various phases?

OR

- III. With the help of an example of recent times in India bring out how conflict arises in society. Explain how accommodation can be used as an effective tool to overcome conflict.

- IV. Differentiate the influence of society on an individual in rural and urban areas. How does the traditional settlement pattern change when an area becomes urbanized?

OR

- V. How does the relationship of man to the immediate environment change in rural and urban areas?

- VI. What are the factors of social change? Explain with specific reference to examples from Kerala.

OR

- VII. Enumerate the factors that affect the safety and security of women and children in urban areas. Detail any two of them.

- VIII. How does housing sector influence the social structure? Bring out the relation between social and spatial structure.

OR

- IX. Discuss the social problems of slums with specific reference to India.

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AR 1308 STRUCTURAL ANALYSIS - I

Time : 3 Hours

Maximum Marks : 100

PART A (Answer ALL questions)

(8 × 5 = 40)

- I.
- What are the assumptions made in the theory of simple bending?
 - A cantilever of length 2 metre fails when a load of 2 KN is applied at the free end. If the cross section of the beam is 30 mm × 50 mm, find the stress at failure.
 - The shear stress is not maximum at the neutral axis in case of a triangular section. Prove this statement.
 - What is the maximum shear stress induced in a solid circular shaft of diameter 15 cm when the shaft transmits 150 KW at 180 r.p.m.
 - Find an expression for slope at the supports of a simply supported beam, carrying a point load at the centre.
 - Explain the various methods for determining slope and deflection at a section in a loaded beam.
 - Explain the term 'equivalent length of a column'. Give the ratios of equivalent length and actual length of columns with various end conditions.
 - What is meant by slenderness ratio of a column? Derive an expression for crippling stress in terms of slenderness ratio for a column.

PART B

(4 × 15 = 60)

- II. A rolled steel I Joist consists of top flange 80 mm × 20 mm, web 20 mm × 200 mm and bottom flange 160 mm × 40 mm. This beam is simply supported over a span of 5 metres. Determine the maximum UDL the beam can carry over the whole span if stress due to bending in compression and tension is not to exceed 120 N/mm² and 150 N/mm² respectively.

OR

- III. Prove that the ratio of depth to width of the strongest beam that can be cut from a circular log of diameter d is $\sqrt{2}$. Hence calculate the depth and width of the strongest beam that can be cut of a cylindrical log of wood whose diameter is 300 mm.

- IV. The shear force acting on a section of the beam is 50 KN. The section of the beam is T shaped with flange 100 mm × 20 mm and web 20 mm × 80 mm. Calculate the shear stress at various sections and draw the shear stress distribution diagram.

OR

- V. A solid circular shaft and a hollow circular shaft whose inside diameter is $\frac{3}{4}$ of the outside diameter, are of same material, of equal lengths and are required to transmit a given torque. Compare the weights of these two shafts if the maximum shear stress developed in the two shafts are equal.

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VI. A beam of length 8 m and of uniform rectangular section is simply supported at its ends. It carries a uniformly distributed load of 6 KN/m run over the entire length. Calculate the width and depth of the beam if permissible bending stress is 10 N/mm^2 and central deflection is not to exceed 0.8 cm. $E = 1 \times 10^4 \text{ N/mm}^2$.

OR

VII. A beam of length 6m is simply supported at its end and carries two point loads of 48 KN each at a distance of 1 m and 3 m respectively from the left support. Find

- (i) deflection under each load.
- (ii) maximum deflection
- (iii) the point at which maximum deflection occurs.

Given $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 85 \times 10^6 \text{ mm}^4$.

VIII. A short length of tube, 4 cm internal diameter and 5 cm external diameter, failed in compression at a load of 240 KN. When a 2 metre length of the same tube was tested as a strut with fixed ends, the load at failure was 158 KN. Assume that critical load in Rankine's formula is given by the first test, find the value of the constant 'a' in the same formula. What will be the crippling load of this tube if it is used as a strut 3 m long with one end fixed and the other hinged?

OR

- IX. (a) Derive the expression for crippling load when both ends of the column are hinged.
- (b) A solid round bar 3 m long and 5 cm in diameter is used as a strut with both ends hinged. Determine the crippling load. Take $E = 2 \times 10^5 \text{ N/mm}^2$.
