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B.Arch. Degree VI Semester Examination April 2020**AR 1602 BUILDING MATERIALS AND CONSTRUCTION V
(2014 Scheme)**

Time : 4 Hours

Maximum Marks : 100

PART A

(8 × 5 = 40)

I. Write short notes on the following:

- (a) Properties of ferro cement
- (b) CBRI and SERC
- (c) Application of Glass
- (d) Thermosetting and thermoplastics
- (e) Acoustic Boards
- (f) Wall panelling
- (g) Importance of shear wall in earthquake resistant structure
- (h) Diagonal Framing

(2 × 10 = 20)

II. Explain the use of plastics in the field of construction, also give a brief description about its advantages and disadvantages.

OR

III. Describe any innovative technique of construction systems developed by Research organizations in India.

IV. Describe wall panelling and false ceiling and the different materials used for it.

OR

V. Explain about earthquake resistant structures, also explain the principles used for its constructions.

PART B

(2 × 20 = 40)

VI. Draw to an appropriate scale detailed plan, section and elevation of wooden wall panelling for walls of a hotel lobby. Assume other necessary details, if required for drawing.

OR

VII. Draw and label the details of fixing concealed lighting and air conditioning fixtures. Assume necessary details required for drawing.

VIII. Draw the details of vertical steel bars in brick masonry for an earthquake resistant structures.

OR

IX. Draw to suitable scale plan and sectional elevation of a room of size 450 cm x 330 cm with 23 cm thick brick wall, height of a room 300 cm, 10 cm thick RCC roof slab, in an earthquake prone area and show reinforcement details of vertical steel bars in masonry provided for earthquake resistance and label parts. Assume the necessary details like position and size of openings.

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B.Arch. Degree VI Semester Examination April 2020

AR 1603 HISTORY OF ARCHITECTURE V
(2014 Scheme)

Time: 3 Hours

Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

- I. Write short notes on the following:
- (a) Contribution of Walter Gropius.
 - (b) Bauhaus- Dessau
 - (c) Neo plasticism.
 - (d) Louis Kahn
 - (e) Neo Classic and New classic architecture
 - (f) Constructivism and Deconstructivism
 - (g) Edwin Lutyens
 - (h) B.V Doshi

PART B
(Explain with neat sketches)

(4 × 15 = 60)

- II. Discuss organic architecture with the philosophies and works of F.L.Wright.
- OR**
- III. "Architecture of the Machine age"- Elaborate the title using the works of Le Corbusier.
- IV. Explain Critical regionalism, its characteristics and illustrate using 2 built examples.
- OR**
- V. Discuss the influence of various art movements for the evolution of various styles within modern architecture.
- VI. Explain Constructivism and Deconstructivism with the help of the works done by Le Corbusier, Peter Eisenman, Frank O Gehry and ZahaHadid.
- OR**
- VII. Explain the works of three Postmodern and three contemporary architects.
- VIII. Describe and compare the characteristics of Lutyen's Delhi and Le Cobusier's Chandigarh.
- OR**
- IX. Describe the contributions of Charles Correa, B.VDoshi and Raj Rewal to the Indian architecture.

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A

B.Arch. Degree VI Semester Examination April 2020

AR 1604 TOWN PLANNING

(2014 Scheme)

(All answers to be supported with relevant sketches)

Time: 3 Hours

Maximum Marks: 100

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

- I. Write short notes on the following:
- Evolution of human settlements.
 - Industrial revolution and its impacts.
 - Central Business District.
 - Agora and Acropolis.
 - Zoning.
 - Urban fringe.
 - Land acquisition act.
 - SEZ.

PART B

(4 × 15 = 60)

- II. Explain Mesopotamian Civilization and town planning in Mesopotamia.
- OR**
- III. Greek civilization was based on philosophies while Roman was strong in engineering. Establish this statement with respect to the Town planning of each civilization.
- IV. Describe various urban environmental problems faced in town planning.
- OR**
- V. Explain the contributions of Sir Ebenezer Howard in the history of Town Planning.
- VI. Define and write the differences between a Master Plan and a Development Plan. Explain the method of preparation of a Master Plan.
- OR**
- VII. Explain Planning Surveys and its necessity. What are the types of Planning Surveys based on collection of Data.
- VIII. What are Urban Development Authorities? Which are the development authorities in Kerala? Explain project implementation process by an Urban Development Authority.
- OR**
- IX. Describe the salient features of Coastal Regulation Zone (CRZ) act.

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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) Explain the principle of convective heat transfer.
 (b) State Fourier law of heat conduction and derive the equation for conduction through plane wall.
 (c) List the similarities and differences between a heat pump and a refrigerator.
 (d) What are the factors affecting human comfort?
 (e) List advantages of split system over window air conditioning system.
 (f) Mention methods used to control noise.
 (g) What are the general requirements of building design in fire protection?
 (h) Describe the classification of fires.

PART B

(4 × 15 = 60)

- II. The wall of a building is a composite consisting of 300 mm layer of common brick ($k = 0.74 \text{ W/mK}$) and 18mm layers of Gypsum plaster ($k = 0.1 \text{ W/mK}$) on both sides of the brick. During a hot day at steady state, the temperature of outside plaster exposed to ambient air is 40°C and the temperature of inside plaster exposed to inside air is 26°C . Find (i) the heat flow rate through the wall per unit area (ii) the temperature of interface of brick and outside plaster. (15)
- OR**
- III. Derive the relation for overall heat transfer coefficient in a composite wall taking both conductive and convective heat transfer modes. (15)
- IV. (a) Derive expression for COP for a refrigerator and a heat pump. (5)
 (b) Explain reversed Carnot cycle using a T S chart and P V chart. (10)
- OR**
- V. (a) List the desirable properties of refrigerants. (7)
 (b) Explain the harmful effects of CFC refrigerants and describe eco friendly refrigerants. (8)
- VI. (a) Define RH, ϕ , WBT and DPT. (8)
 (b) Explain an air conditioning duct system. Discuss the effect of bends in ducts. (7)
- OR**
- VII. (a) Explain the working of chilled water air conditioning system. (5)
 (b) Describe any two air distribution systems with neat sketches. (10)
- VIII. Describe various fire extinguishing techniques. (15)
- OR**
- IX. List the different types of fire sprinklers and compare their advantages and disadvantages. (15)

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AR 1606 STRUCTURAL DESIGN

(2014 Scheme)

(Permitted to use IS-456 and SP-16 chart. Assume the suitable data wherever necessary)

Time: 3 Hours

Maximum Marks: 100

PART A

(Answer ALL questions)

(8 × 5 = 40)

- I. (a) What is the design philosophy of limit state? List the different limit states.
- (b) List various types of shear reinforcements commonly used. Explain with neat sketches.
- (c) What are the advantages and disadvantages of providing clear cover to reinforcement in flexural members.
- (d) Differentiate between one way and two way slab.
- (e) Write a short note on deflection and crack control for RC slab.
- (f) Differentiate between short and long column in RC construction.
- (g) Explain reinforcement requirements of a circular column and a square column..
- (h) Explain the shear considerations applied to the design of footings.

PART B

(4 × 15 = 60)

- II. Design a singly reinforced beam to suit the following data:
Clear span = 3 m, Width of supports = 200 mm, Working Live Load = 6 kN/m, M20 grade concrete, Fe 415 grade HYSD bars.
- OR
- III. Design a reinforced concrete beam of rectangular section using the following data: Effective span = 5 m, width of the beam 250 mm, Overall depth = 500 mm, Service load and live load including self weight = 40 KN/m, Effective cover = 50 mm, M20 grade concrete, Fe 415 HYSD bars. Check the beam for deflection control; and sketch the details of reinforcement.
- IV. A tee beam slab floor of an office comprises of a slab 150 mm thick spanning between ribs spaced 3 m centres. The effective span of the beam is 8 m. Service live load on the floor = 4 KN/m². Using M20 grade concrete and Fe415 HYSD bars, design one of the intermediate tee beam and sketch the details of the reinforcement.
- OR
- V. Design a simply supported RC slab for an office floor having clear dimensions of 4 m by 10 m with 230 mm wall thickness. Adopt M20 grade concrete and Fe 415 grade HYSD bars. Take floor finish = 0.6 KN/m².
- VI. Design a two way slab simply supported on all the four edges for a room 6 m x 4 m clear in size. The superimposed working load is 4 KN/m² with corners held down. Use M20 mix and Fe 415 HYSD bars.

OR

(P.T.O)

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VII. Design the reinforcements in a column of size 400 mm by 600 mm subjected to an axial working load of 2000 kN. The column has an unsupported length of 3m and is braced against side sway in both directions. Adopt M20 concrete and Fe 415 HYSD bars.

VIII. Design the longitudinal reinforcements in a rectangular reinforced concrete column of size 300 mm by 600 mm subjected to a factored load of 1500 kN and a factored moment of 300 kNm with respect to major axis. Adopt M20 grade concrete and Fe 415 HYSD bars.

OR

IX. Design a square spread footing to carry a column load of 1250 kN for a 300 mm x 300 mm column. The bearing capacity of soil is 200 kN/m². Use M20 grade concrete and Fe 415 grade steel.

PART B