　　　Reg. No. ☐☐☐☐☐☐☐☐　　　　**A**

B.Arch. Degree V Semester Regular Examination November 2023

AR 1502 BUILDING MATERIALS AND CONSTRUCTION V
(2021 Scheme)

Time: 4 Hours　　　　　　　　　　　　　　　　　　　　　Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I.　　Write short notes on the following:
(a)　Properties of good paints.
(b)　Bituminous and luminous paints.
(c)　Dumb Waiter.
(d)　Capsule lift.
(e)　Strip foundation.
(f)　Coffered slabs.
(g)　Reinforced concrete jacketing.
(h)　Cavity walls.

PART B

(4 × 10 = 40)

II.　　What are special purpose paints? Discuss the uses and applications of special purpose paints.

OR

III.　　What are the defects in painting and suggest methods to avoid those defects?

IV.　　What are the different planning considerations needed for the design of an elevator. Explain with diagram.

OR

V.　　Point out the mechanical safety systems and automatic controls that are adopted in elevator and escalator designs.

VI.　　What are the types of raft foundations? Explain in detail with sketches.

OR

VII.　　What are the different types of pile foundation? Explain the design principles and considerations for pile foundation.

VIII.　　What are non-destructive tests in concrete? Explain its concept and purposes.

OR

IX.　　What are the causes, effects and methods to prevent dampness in buildings?

(P.T.O.)

B.Arch-V(R)-11.23-3091

PART C

(1 × 20 = 20)

X.   Draw to a suitable scale escalator to be installed in a commercial complex to connect two floors. Floor height: 450 cm.

OR

XI.   Draw to a suitable scale the details of a 15 passenger hospital lift to be installed in a six storied building. Drawings required: Plan, Section showing details of Machine Room and Lift pit.

B.Arch. Degree V Semester Regular Examination
November 2023

AR 1503 HISTORY OF ARCHITECTURE V - EARLY MODERN
(*2021 Scheme*)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I.   Write short notes on:
- (a)   Crystal Palace.
- (b)   New materials during Industrial Revolution.
- (c)   Paris Metro Station.
- (d)   C R Mackintosh.
- (e)   Neo classicism in Indian colonial Architecture.
- (f)   Features of Fountainhas.
- (g)   Municipal Corporation Greater Mumbai.
- (h)   British colonial architecture Calcutta.

PART B

(4 × 15 = 60)

II.   Discuss the impact of industrial revolution on Architecture and the importance of Eiffel Tower in the History of Architecture.

OR

III.   Discuss any two visionary movements in the history of town planning.

IV.   Discuss Arts and Craft Movement and the works of William Morris.

OR

V.   Discuss in detail with relevant sketches the architecture of Sagrada Familia.

VI.   Discuss the influence of colonial architecture in the Bom-Jesus Cathedral complex.

OR

VII.   Discuss early colonial architecture in India and the evolution of Indo-Sarcenic architecture with examples.

VIII.   Discuss the architectural features in Victoria Terminus, Mumbai.

OR

IX.   Discuss Lutyens Delhi and the planning considerations for the same.

***

B.Arch. Degree V Semester Regular Examination November 2023

AR 1504 THEORY OF STRUCTURES IV - RCC STRUCTURES
(2021 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer *ALL* questions)

$(8 \times 5 = 40)$

I. (a) List the assumption of the limit state method.

  (b) Distinguish between balanced, over-reinforced and under-reinforced sections in Limit state design. Which of these should be recommended in design?

  (c) What are T and L beams?

  (d) Differentiate between one way slab and two way slab.

  (e) What are the purposes of lateral ties in a column?

  (f) Explain types of footings with figures.

  (g) Write down five essential properties of timber.

  (h) What are the deflection considerations for the design of timber structures?

PART B

$(4 \times 15 = 60)$

II. Design and detail a singly reinforced concrete beam of rectangular section subjected to a uniformly distributed live load of 10 kN/m over the entire span. Clear span is 5 m. The beam is supported on masonry wall, 230 mm thick on both sides. Use M25 grade concrete and Fe 415 grade steel. Also check for shear stress.

OR

III. Design a rectangular beam section to resist a factored bending moment of 575 kNm. The size of the section is limited to 300 mm × 700 mm overall. Use M20 concrete and Fe 415 steel.

IV. Design a one way slab with 3.0 m clear span supported on 230 mm thick walls on all four sides. The edges are simply supported. The live load on the slab is 2.5 kN/m². Use M20 concrete and Fe 415 steel. Draw top plan and bottom plan to show the reinforcement detailing.

OR

V. Design a slab 3 m × 5 m clear in size supported on 300 mm thick walls on all four sides, and corners held down. The live load on slab 3 kN/m². Use M20 concrete and Fe415 steel.

B.Arch-V(R)-11-23-3093

VI.   Design a square column to carry a factored axial load of 1200 kN. Use M20 concrete and Fe415 steel. Draw a longitudinal section and a cross section showing the reinforcement.

OR

VII.   Design a square footing for an axially loaded column of 450 mm × 450 mm size. Load on column is 800 kN. The safe bearing capacity of soil is 200 kN/m^2. Use M20 concrete and Fe415 steel.

VIII.   Design a timber beam of span 10m to carry a UDL of 20 kN/m, including self weight. The allowable bending stress is 10 N/mm^2 and allowable shear stress is 0.7 N/mm^2.

OR

IX.   A flitched beam is made of timber joists 100 mm × 220 mm with a steel plate of size 20 mm × 160 mm placed symmetrically between them and firmly attached to both. Calculate the moment of resistance of the combined section when the maximum bending stress in timber is 8 N/mm^2. Take Es = 20 Ew.

***

B.Arch. Degree V Semester Regular Examination November 2023

AR 1506 BUILDING SERVICES - II ELECTRICAL DESIGN AND ILLUMINATION
(2021 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I.   (a) Differentiate between AC and DC systems.

  (b) Give a short note on emergency power supply system [EPSS].

  (c) Explain the construction and working of switch fuse unit [SFU] with relevant diagram.

  (d) Give a short note on electrical distribution in buildings.

  (e) Give notes on IBMS system.

  (f) What are rising mains? Which are the different types of rising mains used in high rise buildings?

  (g) How the solar radiation harnessed and used in building to produce electricity?

  (h) List the needs for using earthing in electrical installations.

PART B

(4 × 15 = 60)

II.   Explain delta connected system and give the relationship between phase and line current as well as phase and line voltage. Also derive the equation for power in a 3-phase delta connected system.

OR

III. A 3-phase load consists of 3 similar inductive coils, each of resistance 50Ω and inductance 0.3H. The supply is 415 V. Calculate the line current, power factor, true power, reactive power and apparent power.

IV.   What is a substation? State the functions of a substation. Draw the single line diagram of a substation and explain the various components.

OR

V.   With neat sketch explain the working of (i) ELCB (ii) MCCB.

VI.   Explain lighting quantity, lighting quality, energy consumption and lighting uses.

OR

VII. State inverse square law and Lambert's cosine law. Also explain the different types of lighting arrangement with relevant diagrams.

VIII. What is earthing? With neat sketch explain (i) Pipe earthing (ii) Plate earthing.

OR

IX.   What is lightning protection system [LPS]? Also explain the different types of LPS with relevant diagrams.

***

B.Arch. Degree V Semester Regular Examination November 2023

AR 1507 ARCHITECTURAL ACOUSTICS
(2021 Scheme)

Time: 3 Hours   Maximum Marks: 100

PART A
(Answer *ALL* questions)

(8 × 5 = 40)

I.   Write short notes on the following:
- (a) Properties of sound
- (b) Units for measuring sound
- (c) Sound absorption coefficient
- (d) Reverberation
- (e) Effects of noise pollution
- (f) Transmission loss
- (g) Variable absorbers
- (h) Types of sound absorptive materials.

PART B

(4 × 15 = 60)

II.   Explain propagation of sound and the various factors affecting sound propagation in open air.

OR

III.   Explain the relationship between noise and human behavior. List the various sources of noise in an urban city with appropriate sketch.

IV.   Explain the behaviour of sound in enclosures.

OR

V.   List the possible acoustical defects in a class room. Explain the acoustical remedies to be taken to prevent such defects.

VI.   What are the sources of noise in an office building? Explain the methods in which the noise can be controlled.

OR

VII.   Write short notes on: (i) Air borne and structure borne sound (ii) Noise criteria (iii) Transmission loss.

VIII.   What are the acoustical requirements for designing a recording studio? Explain the design requirements in detail with sketches.

OR

IX.   Give an example of a sound absorptive material. Explain the manufacturing, characteristics and mounting/installation process.

***