B.Arch-III(R/S)-11-25-4374 Reg. No. | | | | | | | | |

C

B.Arch. Degree III Semester Regular/Supplementary Examination November 2025

AR 1302 BUILDING MATERIALS AND CONSTRUCTION-III

(2021 Scheme)

Time: 4 Hours Maximum Marks: 100

Instructions:
i. One drawing sheet to be supplied.
ii. Assume suitable details and dimensions wherever necessary.
iii. Illustrations in answer carry due mark.
iv. Credit will be given for following standard architectural drafting and detailing conventions.

PART A

(Answer **ALL** questions)

(8 × 5 = 40)

I. Write short notes on the following

(a) Physical properties of soil.
(b) Grades of concrete and their applications.
(c) Properties and uses of reinforcement bars.
(d) Applications of titanium
(e) Design principles of stairs
(f) Factors affecting flooring material selection.
(g) Types of footing
(h) Types of formwork

PART B

(4 × 10 = 40)

II. Explain the classification of soils based on their physical properties and discuss the factors affecting the bearing capacity of soils.

OR

III. Discuss in detail the physical and chemical properties of cement. Explain the various tests conducted on cement to determine its quality.

IV. Discuss the properties, utilities and selection considerations of mild steel as building material in architecture.

OR

V. Explain the physical, chemical and structural properties of aluminium and its selection criteria in construction.

VI. What are the different types of stairs based on geometry? Illustrate and explain in detail.

OR

VII. Discuss the concept of spanning in floor construction and describe traditional flooring methods, their selection criteria and materials.

(P.T.O.)

VIII. With neat sketches, define the parts of an RCC framed structure. What are the advantages of framed structures?

OR

IX. What do you mean by deep foundation? Explain in detail the different types of deep foundations.

PART C

$(1 \times 20 = 20)$

X. Draw to a suitable scale the plan, section and details of a straight RCC staircase with a mid-landing, spanning a height of 3 meters to a reasonable scale. Assume any other necessary dimensions.

OR

XI. Draw to suitable scale the plan and section of an RCC well foundation. Mark all the specifications. Assume any other data required.

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C

B.Arch. Degree III Semester Regular/Supplementary Examination November 2025

AR 1303 HISTORY OF ARCHITECTURE III:
INDIAN ARCHITECTURE-ANCIENT TO MEDIEVAL PERIOD
(2021 Scheme)

Time: 3 Hours Maximum Marks: 100

PART A
(Answer **ALL** questions)

(8 × 5 = 40)

I. Write short notes on:

(a) Impact of the Bhakti movement on temple architecture.
(b) Vastu Purusha Mandala
(c) Solanki School of Temple Architecture (Maru- Gurjara Style).
(d) Lad Khan and Durga temples at Aihole, (Early Chalukyan).
(e) Aryan Migration Theory.
(f) Jinalaya with sketches of different parts.
(g) Vedic village.
(h) Brihadeeswara temple

PART B

(4 × 15 = 60)

II. Explain in detail the evolution of Buddhism with its different religious building typologies (using sketches) and also explain the contributions of Emperor Ashoka the Great towards the spread of Buddhism and Buddhist architecture.

OR

III. Discuss the major differences between Jain and Buddhist architecture in terms of structure, symbolism and religious significance. (ex. Stupas, Monasteries, temples, parts of Temple) Justify with sketches if needed.

IV. Explain the different Ancient Town Planning Classifications as described in Manasara Silpa Shastra using sketches. (Mention All the eight Planning Classifications)

OR

V. Explain in detail how the early Vedic period differed from later Vedic period (Political, Religious, Economical) (sketches as needed).

VI. Explain the salient features of the Dravidian style of temple architecture with emphasis on its spatial organization and symbolic meaning.(Include a labeled section and elevation sketch showing Vimana, Mandapa and Gopuram.)

OR

VII. Compare and contrast the Nagara, Vesara and Dravida styles of temple architecture in terms of plan, elevation, spatial organization, constructional techniques and regional characteristics.

(P.T.O.)

VIII. Describe in detail the salient architectural features of the Nagara (Indo-Aryan) style and its regional sub-schools — Odisha, Khajuraho and Solanki. (Include sketches of Rekha Deul, Pidha Deul, and Khakhara Deul forms.

OR

IX. Explain the Kalinga style of temple architecture with the help of notable temple examples. (Sketches should be clear and precise)

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A

B.Arch. Degree III Semester Regular/Supplementary Examination November 2025

AR 1304 THEORY OF STRUCTURES II - STRUCTURAL ANALYSIS

(*2021 Scheme*)

Time: 3 Hours Maximum Marks: 100

PART A

(Answer ***ALL*** questions)

(8 × 5 = 40)

I. (a) Explain the theory of pure bending.

(b) Define section modulus. Write the expression for section modulus for hollow rectangular and hollow circular sections.

(c) Write short notes on the concept of twisting of beams. What are the assumptions made in the theory of pure torsion?

(d) Write short notes on any five forms of truss with neat sketches.

(e) Define determinate and indeterminate beams.

(f) State and explain Moment-area theorems.

(g) What are the assumptions and limitations of Euler's theory?

(h) Derive the Euler's equation for a column hinged at both ends.

PART B

(4 × 15 = 60)

II. A square beam 25 mm × 25 mm in section and 5 m long is supported at the ends. The beam fails when a point load of 550 N is applied at the center of the beam. What 'uniformly distributed load' will break a cantilever beam of the same material 50 mm wide, 80 mm deep and 5 m long? (15)

OR

III. The average shear stress at a section of a simply supported beam having cross-section of 100 mm × 300 mm is 1.75 N/mm^2. Determine the (15)

(i) maximum shear force in the section

(ii) maximum shear stress in the section

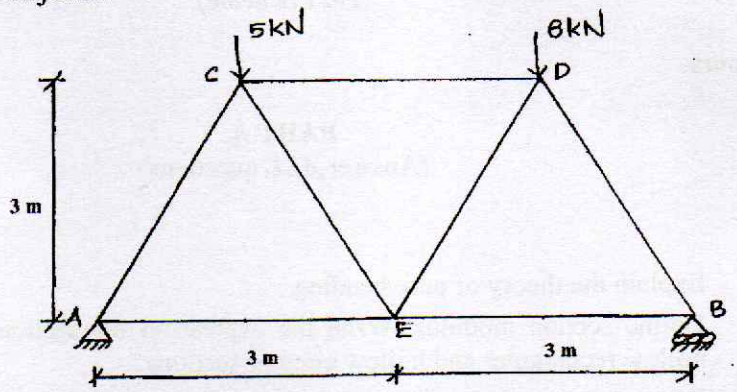
(iii) shear stress at a point on a section located 60 mm above the neutral axis.

(P.T.O.)

IV. A hollow shaft is to transmit 500 kW power at 100 rpm. If the shear stress is not to exceed 60 MPa and the internal diameter is 0.5 times the external diameter, find the diameters of the shaft. (15)

OR

V. Find the forces in the members AE, AC, CD, BD, BE, CE and DE using method of joints. (15)



VI. A beam AB of span 12 m is simply supported at both ends A and B. The beam carries two concentrated loads of 150 kN at C and 100 kN at D. The points C and D are located at a distance of 3 m and 6 m respectively from the support A. Determine the slopes at A and B. Also determine the deflection at C and D. Given: $I = 18 \times 10^8$ mm^4, $E = 200$ kN/mm^2. (15)

OR

VII. A cantilever beam AB of span 10 m carries two concentrated loads of 25 kN and 50 kN at a distance of 2 m and 5 m respectively from the support A. Determine the slope and deflection under each concentrated load. (15)

VIII. A steel tube 8 m long, 6 cm internal diameter and 5 mm thick is used as a column. Find the collapsing load if (15)

(i) both ends are fixed

(ii) one end is fixed and the other end is free.

Take $E = 2 \times 10^5$ MPa.

OR

IX. (a) Derive the Euler's expression for a column with both ends fixed. (5)

(b) A bar of diameter 100 mm and length 12 m is used as a column with both ends pinned. Determine the buckling load for the column. Take $E = 2.1 \times 10^5$ N/mm^2. (10)

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A

B.Arch. Degree III Semester Regular/Supplementary Examination November 2025

AR 1306 CLIMATE AND ARCHITECTURE

(2021 Scheme)

(Illustrate the answers with sketches wherever necessary)

Time: 3 Hours Maximum Marks: 100

PART A

(Answer *ALL* questions)

(8 × 5 = 40)

I. Write short notes on

(a) Landscape elements on Climate and Architecture.

(b) Green House Effect.

(c) Tropical Monsoon Climate.

(d) Azimuth and Altitude angle of Sun.

(e) Body Heat Production and loss.

(f) Time Lag and decrement factor.

(g) Visual Cones.

(h) Types of reflection.

PART B

(4 × 15 = 60)

II. What is meant by Sun Path Diagram? With Illustration explain the azimuth and altitude of Sun on forenoon (any time between 10 am - 11.30 am) or Kollam (8.9° N and 76.61° E, OR Thiruvananthapuram (8.5° N, 76.9° E) during Summer Solstice using Sun Path Diagram.

OR

III. What is meant by Micro Climate? What causes Urban Heat Island?

IV. What are the various Climatic zones of the world? Explain in detail about Warm Humid equatorial climate and Hot Dry desert climate.

OR

V. What are the strategies that can be adopted to design a building in a hot humid climate?

VI. Explain in detail the six factors influencing thermal comfort.

OR

VII. Explain in detail the key aspects of Passive Solar Build Design.

VIII. What are the parameters for shading device design in Buildings? Explain with illustrations the various shading devices used in buildings.

OR

IX. How has Kerala's vernacular architecture handled climatic elements like solar radiation, relative humidity, air temperature, driving rain, wind and glare? Explain in detail with illustrations.

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C

B.Arch. Degree III Semester Regular/Supplementary Examination November 2025

AR 1307 SURVEYING AND LEVELLING
(*2021 Scheme*)

Time: 3 Hours Maximum Marks: 100

PART A
(Answer **ALL** questions)

(8 × 5 = 40)

I. Write short notes on the following
(a) Reciprocal ranging.
(b) Sources of errors in chaining.
(c) Instruments used for plane table surveying.
(d) Temporary adjustments of a theodolite.
(e) Characteristics of contour.
(f) Measuring level difference using dumpy level with neat sketches.
(g) Theomat.
(h) Precautions to be taken while using a total station.

PART B

(4 × 15 = 60)

II. (a) Explain the procedure for setting out the plan on site.
(b) What are the fundamental principles of surveying?

OR

III. Explain the chaining on even and uneven sloping ground.

IV. Explain the measurement of horizontal angle by repetition method using theodolite.

OR

V. Explain three point problem using mechanical method.

VI. Explain cross sectional levelling and reciprocal levelling with neat sketches.

OR

VII. The following readings were successively taken with an instrument in leveling work 0.865, 2.105, 1.025, 1.580, 1.865, 2.230, 2.835, 2.355, 1.760 m. The position of the instrument was changed after 2nd, 5th and 7th readings. Draw out the form of a level book and enter the above readings properly. Assume the Reduced Level of the first point as 560.500 m. Calculate the Reduced Level of all points using rise and fall method and apply usual checks.

VIII. Explain the modulation and types of EDM.

OR

IX. Define:
(i) Total Station
(ii) Aerial Photography
(iii) GPS

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