B.Arch-III(R/S)-11-23-3080 Reg. No. | | | | | | | | | B

B.Arch. Degree III Semester Regular/Supplementary Examination November 2023

AR 1302 BUILDING MATERIALS AND CONSTRUCTION - III

(*2021 Scheme*)

Time: 4 Hours Maximum Marks: 100

Instructions: *i. Illustrate answers with sketches wherever necessary.*
ii. Candidates will be supplied with one drawing sheet of approximate A2 size.

PART A

(Answer **ALL** questions)

$(8 \times 5 = 40)$

I. Write short notes on the following:

(a) Classification of soil.
(b) Test for cement mortar for adhesiveness.
(c) Enlist the utilities of stainless steel.
(d) Mild steel and reinforcement bar.
(e) Types of stone stair.
(f) Differentiate between terrazzo flooring and mosaic flooring.
(g) RCC columns and beams.
(h) Functions of foundation.

PART B

$(4 \times 10 = 40)$

II. Define bearing capacity of soil. Explain the methods for determining it.

OR

III. Explain the steps in concreting process in detail.

IV. Write about the form based classification of aluminium products and selection criteria.

OR

V. Brief about any ten market forms of steel with sketches.

VI. Write about the general design considerations for a stair. Discuss the types of stairs based on structural system.

OR

VII. Explain the various systems used for timber floors in ground floor and upper floor conditions.

VIII. Differentiate between methods of Shallow footing and Deep footing.

OR

IX. Explain the principles and components of framed structures. Detail out RCC Slabs.

(P.T.O.)

PART C

$(1 \times 20 = 20)$

X. Draw to suitable scale the plan, section and reinforcement details of a dog legged RCC stair to connect two levels in a residential building. Floor to floor height is 315cm. Mark all the specifications. Assume any other data required.

OR

XI. Draw to suitable scale plan, section, and isometric view of different types of shallow foundations with neat labels. Assume any other data required.

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B.Arch-III(R/S)-11-23-3081 Reg. No. | | | | | | | | |

A

B.Arch. Degree III Semester Regular/Supplementary Examination November 2023

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 the following:

(a) Brief on Vedic Culture.

(b) Hinayana and Mahayana Buddhism.

(c) Rock cut architecture in Ajanta and Ellora.

(d) Rani Gumpha, Udayagiri.

(e) Elements of Temple Architecture.

(f) Lingaraja Temple, Bhuvaneswar.

(g) Virupaksha Temple, Pattadakal.

(h) Evolution and form of Gopuram.

PART B

(4 × 15 = 60)

II. Explain the debates and theories on origin of Early Hinduism related to Vedic Civilization.

OR

III. Explain in detail on Vedic Village, its planning techniques and construction methods.

IV. Elaborate the importance of material and construction technique in Jain Temple Architecture.

OR

V. Brief on Building typologies of Buddhist Architecture with suitable examples.

VI. Explain the Temple Architecture of Northern India with salient features and examples.

OR

VII. Brief on early Chalukyan temple Architecture found in Central India with example.

VIII. Describe the history of Temple Architecture in Southern India with the help of Temple Town.

OR

IX. Elaborate on temples constructed during Cholas period with suitable examples and sketches.

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B.Arch-III(R/S)-11-23-3082 Reg. No. | | | | | | | | |

B

B.Arch. Degree III Semester Regular/Supplementary Examination November 2023

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. Write short notes on the following.

(a) Theory of simple bending with assumptions.

(b) Difference of procedure in finding out the bending stress in (i) symmetrical section (ii) an unsymmetrical section.

(c) Define torsion, torsional rigidity and polar moment of inertia.

(d) Describe the methods which are employed for finding out the forces in a frame.

(e) Mohr's theorems.

(f) Macaulay's method and its uses.

(g) Failures of long columns and short columns.

(h) Equivalent length and its uses.

PART B

(4 × 15 = 60)

II. A rectangular beam, simply supported over a span of 4 m, is carrying a UDL of 50 kN/m. Find the dimensions of the beam, if depth of the beam section is 2.5 times its width. Take maximum bending stress in the beam section as 60 MPa.

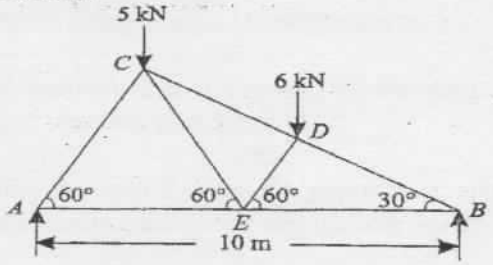
OR

III. A composite beam consists of a wooden joist 15 cm wide and 25 cm deep strengthened by two steel plates 15 mm thick and 25 cm deep on each side. If the maximum stress in the wooden joist is 8 N/mm^2, find the corresponding maximum stress attained in steel. Find also the moment of resistance of the composite section. Take Young's modulus for steel = 2×10^5 N/mm^2 and for wood = 1×10^4 N/mm^2.

IV. A solid steel shaft has to transmit 60 kW at 200 rpm. Taking allowable shear stress as 80 N/mm^2, find suitable diameter for the shaft, if the maximum torque transmitted at each revolution exceeds the mean by 30%.

OR

V. A truss of span 10 meters is loaded as shown below. Find the forces in all the members of the truss.



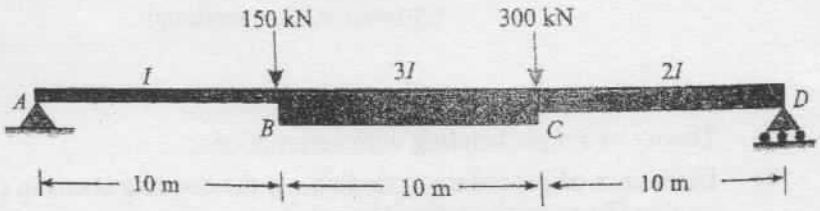
(P.T.O.)

B.Arch-III(R/S)-11-23-3082

VI. A cantilever of length 2a is carrying a load of W at the free end, and another load of W at its centre. Determine, by moment area method, the slope and deflection of the cantilever at the free end.

OR

VII. A beam ABCD is simply supported at its ends A and D over a span of 30 m. It is made up of 3 portions AB, BC and CD each 10 m in length. The moment of inertia of section over each of these individual portions is uniform and the I values for them are I, 3I and 2I respectively, where $I = 20 \times 10^9$ mm^4. The beam carries a point load of 150 kN at B and another load of 300 kN at C as shown below.



VIII. A T-section 150 mm × 120 mm × 20 mm is used as a strut of 4 m long with hinges at its both ends. Calculate the crippling load, if Young's modulus for the material be 200 GPa.

OR

IX. An alloy tube 60 mm diameter and 2.8 m length is used as a strut with both ends hinged. If the tube is subjected to an eccentric load equal to 60% of the Euler's crippling load, find the value of eccentricity. Take yield strength as 320 MPa and modulus of elasticity as 210 GPa.

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B.Arch-III(R/S)-11-23-3083 Reg. No. | | | | | | | | |

C

B.Arch. Degree III Semester Regular/Supplementary Examination November 2023

AR 1306 CLIMATE AND ARCHITECTURE

(*2021 Scheme*)

Time: 3 Hours Maximum Marks: 100

(*Illustrate answers with sketches wherever necessary*)

PART A

(Answer **ALL** questions)

(8 × 5 = 40)

I. Write short notes on the following:

(a) Importance of climatic study in architecture.

(b) Coriolis force.

(c) AH and RH.

(d) Sun Path Diagram.

(e) Bioclimatic chart.

(f) The importance of understanding the value of heat transmittance and heat resistance.

(g) Glare and reflection.

(h) Radiation spectrum and importance of visual spectrum.

PART B

(4 × 15 = 60)

II. Explain the tilt of earth's axis, its importance and relevance as global climatic factor. Also explain winter solstice and summer solstice in detail.

OR

III. Explain Global wind pattern in detail. Explain what differences happen to air current in Trade wind, westerlies and polar winds.

IV. Which are the major climatic zones around the world? Explain the special features of Hot-Dry Maritime desert climate in detail.

OR

V. Explain the elements of climate. Also explain the methods of quantification and application of same in design process.

VI. What are thermal comfort indices? Explain ET CET monograms Bioclimatic Chart in detail.

OR

VII. Enumerate the design considerations to be taken while designing shelter for tropical climate, citing Kerala climate as example.

VIII. Explain natural ventilation in and around the building. Explain active and passive system of ventilation in detail.

OR

IX. What are shading devices? Explain the importance, application, types and fundamental calculation concept for any shading device.

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B.Arch-III(R/S)-11.23-3084 Reg. No. | | | | | | | | |

B

B.Arch. Degree III Semester Regular/Supplementary Examination November 2023

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) Errors in chaining.
(b) Factors to be considered while selecting survey station.
(c) Advantages and disadvantages of plane table surveying.
(d) Measurement of horizontal angle in theodolite traversing.
(e) (i) Reduced level (ii) Line of collimation (iii) Bench marks.
(f) Uses of a contour map.
(g) Differences between dumpy level and auto level.
(h) Basic principles of total station.

PART B

(4 × 15 = 60)

II. Write down the procedure of field work for chain surveying.

OR

III. The following offsets are taken from a survey line to a curved boundary line:

Distance (m)	0	5	10	15	20	30	40	60	80
Offset (m)	2.50	3.80	4.60	5.20	6.10	4.70	5.80	3.90	2.20

Find the area between the survey line, the curved boundary line, and the first and the last offsets by: (i) Trapezoidal Rule (ii) Simpson's Rule.

IV. Describe in detail the various methods of plane tabling.

OR

V. Explain the steps involved in the temporary adjustment of a theodolites.

VI. The following consecutive readings were taken with a levelling instrument at intervals of 20 m: 2.375, 1.730, 0.615, 3.450, 2.835, 2.070, 1.835, 0.985, 0.435, 1.630, 2.255 and 3.630 m. The instrument was shifted after the fourth and eighth readings. The last reading was taken on a BM of RL 110.200 m. Find the RLs of all the points.

OR

VII. Elaborate on the different methods of contouring.

VIII. Explain the role of EDM in surveying. Also describe the types of EDM instruments.

OR

IX. Write the important operations, advantages and disadvantages of a total station.

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