

--	--	--	--	--	--	--	--

B.Arch. Degree III Semester Examination November 2020

AR 1302 BUILDING MATERIALS AND CONSTRUCTION - II

(2014 Scheme)

(Illustrate the answer with sketches wherever necessary.)

To be supplied with one drawing sheet of approximate A2 size)

Time : 4 Hours

Maximum Marks : 100

PART A

(8 × 5 = 40)

I. Write short notes on:

- Safe Bearing Capacity of soil
- Test of Cement Mortar for adhesiveness
- Requirements of aggregates
- Admixtures of cement concrete
- Advantages of Framed structures
- Shallow foundation and deep foundation
- Factors involved in staircase design
- Dog legged staircase

(2 × 10 = 20)

II. What are the components and their proportion in cement and explain different type of cement and their applications?

OR

III. Explain briefly the concreting process starting from batching till curing.

IV. What are the major functions of a foundation? Discuss briefly on different deep foundations.

OR

V. What are the different types of concrete stairs used in buildings? Explain with sketches.

(2 × 20 = 40)

PART B

VI. Draw to a suitable scale, the plan, section and view of an isolated column footing.

OR

VII. Draw to a suitable scale the wall section showing the details of R.C.C lintel and sunshade.

VIII. Draw to suitable scale, the plan and section of a dog legged concrete staircase of width 120 cm and floor to floor height 300 cm.

OR

IX. Draw to suitable scale, the plan and section of a R.C.C. spiral stair to reach a height of 2.1 m. Outer diameter of the stair is 2 m.

--	--	--	--	--	--	--	--	--	--

B.Arch. Degree III Semester Examination November 2020**AR 1303 HISTORY OF ARCHITECTURE II**
(2014 Scheme)

Time: 3 Hours

Maximum Marks: 100

Instructions: Support the answers with neat sketches**PART A**
(Answer ALL questions)

(8 × 5 = 40)

- I. Write short notes on the following:
- Brihadeshwara Temple
 - Lingaraja Temple
 - Mosque at Ajmer
 - Tomb of Balban
 - Hawa Mahal
 - Teen Darwaza
 - Fatehpur Sikri
 - Mughal gardens

PART B

(4 × 15 = 60)

- II. Explain the complexity of planning of the Kailasanatha temple.
OR
- III. Explain with sketches the Dravidian Architecture.
- IV. Draw a neat sketch of Qutab Complex highlighting the contributions of various rulers and illustrate Qutab Minar in detail.
OR
- V. Illustrate with sketches the contribution of sayyid and Lodhi dynasties in the evolution of Islamic Architecture in India with examples.
- VI. Explain Gujarat provincial style with examples.
OR
- VII. Explain the architectural features of Golgumbaz. Explain the method of intersection of arches with neat sketches.
- VIII. Explain Jami Masjid at Delhi and Moti Masjid at Delhi Fort.
OR
- IX. Explain the contributions of shah Jahan and elaborate the details of Taj Mahal as an example.

--	--	--	--	--	--	--	--

B.Arch. Degree III Semester Examination November 2020

AR 1304 BUILDING CLIMATOLOGY (2014 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART A (Answer *ALL* questions)

(8 × 5 = 40)

- I. Write short note on:
- (a) Sun path diagram
 - (b) Coriolis Force
 - (c) Time lag and Decrement factor
 - (d) Factors which affect the Urban climate
 - (e) Thermal Balance of the Earth
 - (f) Olgyay's Bioclimatic chart
 - (g) Conduction and Convection heat flow
 - (h) Design recommendations for Composite climate

PART B

(4 × 15 = 60)

- II. Explain the role of tilt in earth's axis in Climatology. Explain with a neat sketch the Tilt of earth's axis and its effect on solar radiation.
- OR**
- III. Discuss in detail the Global wind pattern considering the Earth's rotation and influence of thermal forces.
- IV. Explain the general design guidelines that make a built form appropriate to warm humid regions with heavy rainfall.
- OR**
- V. Briefly explain the six major elements of climate and its quantification systems. Discuss how these elements that affects Architecture and human comfort.
- VI. Describe briefly the thermal balance of human body. Briefly explain the various climatic and subjective variables that influence the thermal comfort of a person.
- OR**
- VII. Explain the thermal comfort Indices. Discuss in detail with neat diagram of the following thermal comfort indices used to assess the thermal comfort level.
- (i) Effective Temperature (ET)
 - (ii) Corrected Effective Temperature (CET)
- VIII. Enumerate with illustrations the techniques used in buildings to achieve thermal comfort through passive mechanism in a built environment.
- OR**
- IX. What are the important characteristic features of building in Kerala, designed according to the climatic features? Explain in detail with neat sketches.

B.Arch-III-11.20.1338

Reg. No.

--	--	--	--	--	--	--	--	--	--

A

B.Arch. Degree III Semester Examination November 2020

AR 1305 ARCHITECTURAL GRAPHICS II
(2014 Scheme)

(One A2 drawing sheet is to be supplied)

Time: 4 Hours

Maximum Marks: 100

PART A
(Answer ALL questions)

(4 × 5 = 20)

- I. Write short notes on the following:
- Image resolution.
 - Vector and Raster graphics.
 - Signs and symbols.
 - Corporate design.

PART B

(2 × 40 = 80)

- II. Design a multi-coloured poster in A3 size (29.7 cm × 42 cm) for the theme. 'Save farmers, Save India'.

OR

- III. Create a multi-coloured poster in A3 size (29.7 cm × 42 cm) for the Department of Health to create public awareness against Covid - 19.

- IV. Draw a three point perspective (Aerial view) composition of a city. Render in pencil with light and shade effect.

OR

- V. Draw an interior view of a living room in one point perspective. Render in pencil with light and shade effect.

--	--	--	--	--	--	--	--	--	--

B.Arch. Degree III Semester Examination November 2020

AR 1306 HUMANITIES (2014 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART A (Answer *ALL* questions)

(8 × 5 = 40)

- I. Write short notes on the following:
- Society prior to industrial revolution
 - Functions of family
 - Man, environment and society relationship
 - Features of rural society in India
 - Urban safety
 - Social change
 - Urbanization
 - Slums

PART B

(4 × 15 = 60)

- II. Mention the primary concepts of sociology. Differentiate between association and institution.
- OR**
- III. Relevance of studying sociology for architecture students.
- IV. Describe the unique settlement pattern and architecture of Kerala.
- OR**
- V. Characteristics of Indian villages and its trends of change.
- VI. Discuss about the social problems and social change in Indian context.
- OR**
- VII. Explain in detail about social class and social caste in Indian context.
- VIII. What is social structure? Explain the components and characteristics of social structure.
- OR**
- IX. What are the social problems of slums in India?

--	--	--	--	--	--	--	--

B.Arch. Degree III Semester Examination November 2020

AR 1308 STRUCTURAL ANALYSIS I (2014 Scheme)

Time: 3 Hours

Maximum Marks: 100

PART A (Answer ALL questions)

(8 × 5 = 40)

- I. (a) What are the assumptions made in the theory of simple bending?
- (b) Derive section modulus of rectangular, circular, hollow rectangular and hollow circular sections.
- (c) Explain the terms flitched beam and conjugate beam.
- (d) The Shear stress is not maximum at the neutral axis in case of triangular section. Prove this statement.
- (e) Define elastic curve. Derive the basic differential equation of the elastic curve.
- (f) Using Mohr's theorem, derive expression for slope and deflection of simply supported beam carrying UDL throughout its span.
- (g) Differentiate the structural behaviour of short and long column.
- (h) Write the assumptions in Euler's column theory.

PART B

(4 × 15 = 60)

- II. A simply supported beam of 5 m span carries uniformly distributed load of 10 kN/m and a point load of 20 kN at the centre of the span. If the permissible stress is limited to 150 Mpa, determine the dimensions of rectangular section taking width equal to half the depth of the beam.

OR

- III. A water main 500 mm internal diameter and 20 mm thick is running full. The water main is of cast iron and is supported at two points 10 m apart. Find the maximum stress in the metal. The cast iron and water weigh 72000 N/m³ and 10000 N/m³ respectively.

- IV. A flitched beam consists of a wooden joist 10 cm wide and 20 cm deep strengthened by two steel plates 10 mm thick and 20 cm deep. If the maximum stress in wooden joist is 7 N/mm². Find the corresponding maximum stress attained in steel. Also find the moment of resistance of the composite section. Take Young's Modulus for steel = 2×10^5 N/mm² and for wood = 1×10^4 N/mm².

OR

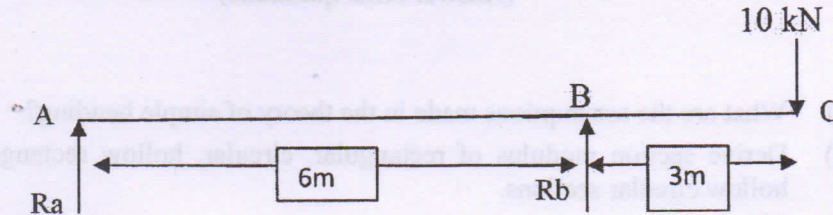
- V. The shear force acting on a section of the beam is 50 kN. The section of the beam is T-shaped with flange 100 mm × 20 mm and web 20 mm × 80 mm. Calculate the shear stress at various sections and draw the shear distribution diagram.

(P.T.O.)

- VI. A beam of length 8 m is simply supported at the ends. It carries a UDL of 40 kN/m for a length of 4 m starting at 1 m from the left end. Determine deflection of beam at mid span and also the position and value of maximum deflection. Given $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 4.3 \times 10^8 \text{ mm}^4$.

OR

- VII. An overhanging beam ABC is loaded as shown in figure. Find the slopes over each support and at the right end. Find also the maximum upward deflection between the supports and the deflection at the right end. Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 5 \times 10^8 \text{ mm}^4$.



- VIII. A hollow cylinder cast iron column is 4 m long with both ends fixed. Determine the minimum diameter of the column if it has to carry a safe load of 250 kN with a factor of safety 5. Take internal diameter as 0.8 external diameter ($a = (1/1600)$ and $\sigma_c = 550 \text{ N/mm}^2$).

OR

- IX. A hollow alloy tube 5 m long with external and internal diameters 40 mm and 25 mm respectively was found to extend 6.4 mm under a tensile load 60 kN. Find the buckling load for the tube when used as a column with both ends pinned. Also find the safe loads for the tube, taking a factor of safety = 4.
