CBCS SCHEME

USN | | | | | | | | | | |

18ARC33

Third Semester B.Arch. Degree Examination, June/July 2025
Climatology

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 Explain how weather data is recorded by a weather station, supported with sketches. **(20 Marks)**

OR

2 Define thermal comfort. Discuss various thermal comfort indices with relevant parameters and applications in architectural design. **(20 Marks)**

Module-2

3 Illustrate and explain the sun path diagram and its components. Also, explain the method of computing solar altitude and azimuth for a given date and time. **(20 Marks)**

OR

4 Write short note on:
a. Modes of heat transfer in buildings.
b. Concept and significance of SOL-Air temperature
c. Solar Heat Gain Factor (SHGF) and its role
d. Over heated and underheated period. **(20 Marks)**

Module-3

5 Calculate the U-value of a composite wall using the given material properties.
- Brick – 0.20 m thick – 0.72 k, w/m-k Thermal conductivity
- Insulation – 0.05 m thick – 0.025 (k, w/m-k) Thermal conductivity
- Plaster (inside) – 0.015 thick – 0.22 (k, w/m-k) Thermal conductivity
- Outside surface resistance – 0.04 m^2.k/w
- Inside surface resistance – 0.12 m^2.k/w **(20 Marks)**

OR

6 a. Differentiate between steady state and periodic heat flow. **(10 Marks)**
b. Define and differentiate thermal conductivity, resistivity, diffusivity and thermal capacity. Explain how they influence thermal performance of building materials. **(10 Marks)**

Module-4

7 Design and explain shading devices suitable for buildings in composite climates. Illustrate orientation-based strategies to minimize solar heat gain and optimize thermal comfort. **(20 Marks)**

OR

8 Explain the principles and function of natural ventilation in buildings. Discuss how stack effect influence air movement. **(20 Marks)**

Module-5

9 Explain the concept of daylight factor and its components. Discuss how north light and day lighting device contribute to lighting in buildings. **(20 Marks)**

OR

10 Explain the key design strategies for buildings in a hot dry climate. Discuss the role of form, orientation materials, openings in enhancing thermal comfort. **(20 Marks)**

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