

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

M.Tech-I Semester CE

COURSE CODE (CREDITS):10M11CE115 (3)

MAX. MARKS: 25

COURSE NAME: Mechanical and Electrical Systems in Building

COURSE INSTRUCTORS: Akash Bhardwaj

MAX. TIME: 1 Hour 30 Min

Note:(a)All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

(C) Scientific calculator allowed.

Q.No	Question	Marks
Q1 (a)	Why is a higher R-value generally considered better for insulation performance?	2
Q1 (b)	Compare the insulation performance of two materials: - Material A: $R = 1.5 \text{ m}^2 \cdot \text{K/W}$ - Material B: $R = 2.8 \text{ m}^2 \cdot \text{K/W}$ Which material should be preferred and why?	3
Q1 (c)	A roof assembly includes multiple layers: roof finish ($R = 0.05$), insulation ($R = 4.0$), and concrete slab ($R = 0.1$). Determine the total R-value and comment on its efficiency for hot climate conditions.	3
Q2 (a)	How does the location of doors and windows affect heat gain and loss, natural lighting and ventilation in a building? Draw suitable figures wherever required.	3
Q2 (b)	Sketch a simple diagram showing the main components of a panel door and label them.	3
Q3 (a)	A residential plot measures $15 \text{ m} \times 30 \text{ m}$. If the permissible FAR is 1.5, calculate the maximum built-up area allowed.	3
Q3 (b)	A school requires fire exits as per planning principles and bye-laws. Explain how this affects the planning of staircases and corridors.	3
Q4 (a)	If a fire breaks out on the 4th floor of a building, explain how fire escapes and equipment should be used for safe evacuation.	3
Q4 (b)	What are the different types of fire extinguishers and their specific uses?	2