UPES
End Semester Examination, December 2024
Course: Fire Engineering IV (Risk Assessment & Planning)   Semester: VII
Program: B Tech- Fire & Safety Engineering   Time   : 03 hrs.
Course Code: HSFS4005   Max. Marks: 100

Instructions: Attempt all the questions.

SECTION A
(5Qx4M=20Marks)

S. No.	Questions	Marks	CO
Q 1	Explain why industrial and hazardous buildings require special safety measures.	4	CO1
Q 2	Differentiate between mercantile and business occupancies in terms of usage and safety requirements.	4	CO3
Q 3	Examine the relationship between panic behaviour and evacuation efficiency in emergencies.	4	CO3
Q 4	Enlist the objectives of fire safety training for residential building occupants.	4	CO1
Q 5	Identify the suitable location for external fire escape ladders in a residential apartment.	4	CO1

SECTION B
(4Qx10M= 40 Marks)

Q 6	Propose fire safety requirements in planning & designing a multi-functional building ensuring compliance according to NBC. **OR** Develop an evacuation plan for a mercantile building with multiple exits and a high daily footfall.	10	CO5
Q 7	Explain with an example, how capital investment in fire safety improves cost-effectiveness in the long term.	10	CO2
Q 8	Evaluate the role of fire insurance in mitigating financial losses in the event of a fire, especially arson.	10	CO4
Q 9	Explain how smokeproof stairs contribute to safe evacuation in high-rise residential buildings.	10	CO1

SECTION-C
(2Qx20M=40 Marks)

Q 10	Design a fire safety system for a mixed-use building considering cost, compliance, and efficiency. **OR** Design a fire safety training module focusing on evacuation drills for large industrial facilities.	20	CO5
Q 11	(a) For a 6-storey building, if the width of staircases is 1.25m, calculate the occupant serving capacity of the stairs. (b) Calculate the minimum area required for refuge of four floors of 500m^2 each. The occupant load is 10m^2/person and the occupant density is 0.3m^2/person.	20	CO4