CBCS SCHEME

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BCV306D

Third Semester B.E./B.Tech. Degree Examination, June/July 2025

Fire Safety in Buildings

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With neat sketch explain the concept of fire triangle.	06	L2	CO1
	b.	Explain the various principles involved in the fire extinguishing.	08	L2	CO1
	c.	With time-temperature curve briefly explain the various stages of fire.	06	L2	CO1
		OR			
Q.2	a.	Briefly explain the design consideration for fire safety in concrete and steel structures.	10	L2	CO1
	b.	Briefly explain the effect of fire on the following construction materials: i) Concrete ii) Steel iii)Timber iv) Stone	10	L2	CO1
		Module – 2			
Q.3	a.	Briefly explain about various fire suppression systems.	10	L2	CO2
	b.	What is Refuge Area? Mention the rules for Refuge area as per NBC code.	10	L2	CO2
		OR			
Q.4	a.	What are the assumption to be made in the lift design?	10	L2	CO2
	b.	Consider a building with 16 floors having population of 1000. The details of lift are given below; Car capacity = 16 Door closing time = 2.5 sec. Door opening time = 1.5 sec. No. of lifts = 05 Single floor flight time = 5 sec. Single floor transit time = 1 sec. Passenger transfer time = 1.2 sec. Calculate : i) Round trip time (RTT) ii) Average number of stops iii) Time consumed when stopping iv) Up peak Interval v) Up peak handling capacity.	10	L3	CO2
		Module – 3			
Q.5	a.	What is fixture unit? Mention the essential requirements of plumbing fixtures.	10	L2	CO3
	b.	Enumerate the steps involved in the design of water supply distribution system.	10	L2	CO3

OR

Q.6 Find the pipe size required to provide water supply for a 4 storey (G + 4) building with each storey height of 3m. A water tank is supported over the terrace on columns of height 3m. The fixture in each apartment consists of following: (Elevation of highest fixture = 1.95m) — **20 | L4 | CO4**

Room	Type of Fixture	Fixture unit value
Kitchen	Kitchen sink Kitchen tap	02 02
Water closet (W.C) Room	Ablution tap Supply to over head flush tank	01 01
Bath Room	Shower Tap Wash Basin Supply to Geyser	02 02 01 02

Assume loss of head in a 25mm size meter in 4.5m.

Module – 4

Q.7 a. Explain the role of maintenance management in overall building construction activity. — **10 | L2 | CO4**

b. Write short notes on : — **10 | L2 | CO4**
i) Intelligent Buildings
ii) Psychrometric chart

OR

Q.8 a. Following data are available for air conditioned restaurant: — **12 | L3 | CO4**

Outside design condition :
Dry Bulb Temperature = 41.9°C
Wet Bulb Temperature = 27.1°C
Inside design condition :
Temperature = 26°C
Relative Humidity = 50%
Size of Restaurant = 20m × 15m × 4m
No. of Air changes / hour = 2
Opening and closing of door per hour = 3
Use factor = 3
Air ventilation required /person = 0.48m^3/person
Humidity ratio for outside and inside are 16.6 and 11.1 respectively.
Maximum capacity of Restaurant = 100 persons.
Calculate:
i) Total Infiltration in m^3/min.
ii) Ventilation required in m^3/min and
iii) Total load due to outside air.

b. Mention the governing equations with notations for — **05 | L2 | CO4**
i) Sensible Heating and Cooling ii) Heating and Humidification.

c. What is life cycle cost? How it is determined for a building? — **03 | L2 | CO4**

Module – 5

Q.9 a. Enumerate the points to be considered while carrying out diagnosis of building by visual survey. — **10 | L2 | CO5**

b. Explain the procedure for carrying out the following tests. — **10 | L2 | CO5**
i) Pulse velocity method ii) Rebound Hammer test

OR

Q.10 a. Explain the effects of corrosion of steel in concrete. — **10 | L2 | CO5**

b. Write short note on : — **10 | L2 | CO5**
i) Carbonation in concrete ii) RCPT Test.