

# Nirma University

## Institute of Technology

Semester End Examination (IR), December - 2022

B. Tech. in All Programmes, Semester-VII

2CHOE26 Introduction to Fire and Safety Engineering

Roll  
No.

Supervisor's initial  
with date

**Time: 3 Hours**

**Max. Marks: 100**

- Instructions:
1. Attempt all questions.
  2. Figures to right indicate full marks.
  3. Assume necessary data where needed.
  4. Draw neat sketches wherever necessary.
  5. Use separate answer book for each section.

### Section I

- Q.1** "Globally, fire safety standards focus on preventing the initiation of fire by establishing performance-based norms which, if adhered to, will improve the fire safety of materials and products. The declining trends in fire deaths illustrate the effectiveness of fire safety standards." Support this statement with arguments. (10) CO2  
BL5

- Q.2 Answer the followings:** (15) CO1

- A.** As an engineer, explain the chemical chain reaction takes place in fire. 7 BL5
- B.** By analysis of fire accidents, what are the common causes of death found in the fire? 8 BL4

**OR**

- Q.2 Answer the followings:** (15) CO1

- A.** Elaborate on the interested parties in fire safety. 7 BL6
- B.** One of the fundamental questions addressed by risk-benefit analysis is "How safe is safe enough?" Give your opinion in the context of fire. 8 BL5

- Q.3 Answer the followings:** (25) CO2

- A.** Distinguish the following extinguishers on the basis of their construction, working, advantages, limitations, etc. 15 BL3
- Modular automatic extinguishers  
Water mist extinguishers  
Dry chemical powder extinguishers
- B.** "Detectors may be classified on the basis of fire effects they detect" Agree or not? Justify your answer. 10 BL3

## Section II

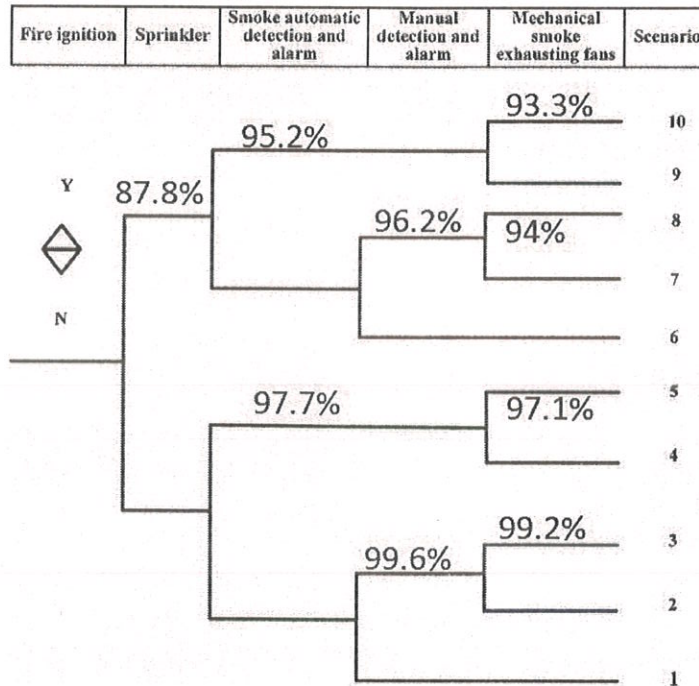
- Q.4** "A medium-velocity water spray system, high-velocity water spray systems or automatic sprinklers can replace each other." (15) C02  
 Agree or not? Justify your answer with the purpose of use in BL5  
 residential premises.

- Q.5 Answer the followings:** (15) C04

- A.** Fire engulfed the third and fourth floors of Takshashila Centre in Surat, Gujarat. At least 20 people died in the incident. Create a fault tree analysis for it with suitable assumptions. 10 BL3

OR

- A.** In a plant, a fire protection system is installed. The components' successful operation ratio is shown in the figure. Calculate the possibility of each scenario. 10 BL3



- B.** Before accepting the fire insurance proposal prepared by the insurance company, which points, will you analyze to sure suitability for your company? 05 BL3

- Q.6 Answer the followings:** (20)

- A.** As an investigator, explain the significance of burn patterns, smoke patterns, charred timber, etc., indicating the path of fire growth. 15 C03  
 BL3
- B.** How is the 'size' of a fire estimated? How can HRR be used to assess the stage of a fire? 05 C01  
 BL3

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