Dr Antaram N. Sarve
4/5/23 (5)

Roll No. 70

NATIONAL INSTITUTE OF TECHNOLOGY HAMIRPUR

B. Tech (Chemical Engineering) – VIIIth Semester

END-SEMESTER EXAMINATION (May, 2023)

CH-421 Industrial Safety and Hazard Management

Duration: 3 Hrs. **Max. Marks: 50**

Note:

- *Attempt all questions*
- *Wherever necessary, draw neat diagram, assume data if required*
- *Assign proper and correct number for each answer in the answer sheet.*

Sr. No.	Questions	Marks	COs
1.	Explain the different types of portable fire extinguishers in detail with neat sketch.	8M	CO1
2.	Define LFL and UFL. Draw the flammability diagram for Ethylene (C_2H_4). (Use normal graph paper) Given Data: LFL and UFL of C_2H_4 in Air, LFL = 2.7, UFL = 36 LFL and UFL of C_2H_4 in Pure Oxygen, LFL = 3, UFL = 80	8M	CO1
3.	Define HIRA. Make HIRA report for the reaction is carried out between Ketone suspended in Diethylene glycol and 80% solution of Hydrazine hydrate at temperature of 200°C and atmospheric pressure to produce cyclic compound. (Diethylene Glycol LD_{50}–1200mg/kg, KOH LD_{50}– 273mg/kg, Hydrazine Hydrate LD_{50}– 60mg/kg)	8M	CO4
4.	Determine the mixture TLV at 25 °C and 1 atm pressure of a mixture derive from following liquid:	8M	CO2
5.	Seventy five people are tested for skin irritation because of a specific dose of a substance. The responses are recorded on a scale from 0 to 10, with 0 indicating no response and 10 indicating high response. The number of individuals exhibiting a specific response is given in the following table: (i) Determine the mean and Standard deviation (ii) Plot the histogram of the number of individuals affected verses the response (iii) Compute the normal distribution function	8M	CO2

Component	A	B	C
Heptane	6.89677	1264.90	216.54
Toluene	6.95464	1344.8	219.48

Component	Mole percent	Species TLV (ppm)
Heptane	50	400
Toluene	50	20

Response	Number of individuals affected
0	0
1	5
2	10
3	13
4	13
5	11
6	9
7	6
8	3
9	3
10	2

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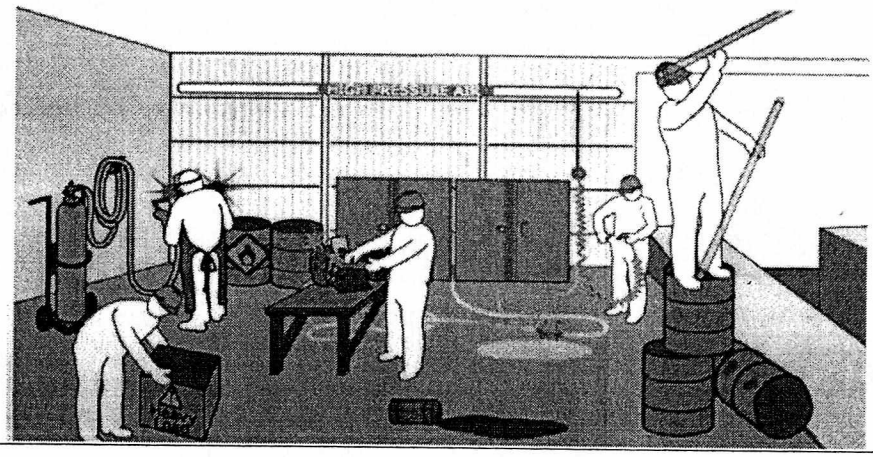
6.	Explain in detail the Bhopal gas disaster.	5M	CO1
7.	Identify the different scenarios of hazards from the given picture and categorise them into the types of hazards. 	5M	CO3 CO4