1304N022

Candidate's Seat No :_____

B.Sc. (F&S) Sem.-6 Examination

Fire Safety, Risk Assessment & Management

April 2022

Time : 2-00 Hours] **[Max. Marks : 50**

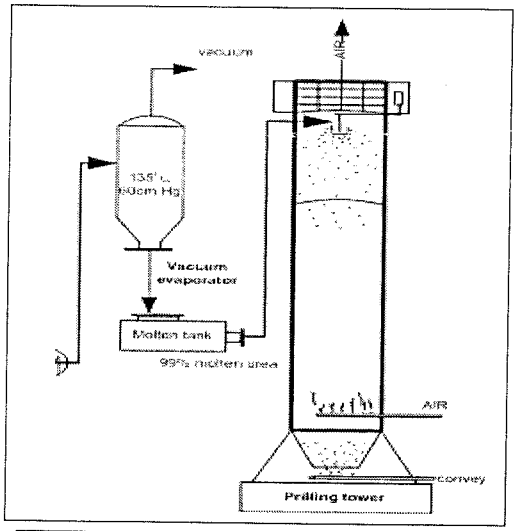
Instruction: All questions in section-I carry equal marks.
Attempt any three questions in section-1.
Question in section-II is compulsory.

Section-I

Question-1

A. What should be the management structure and responsibilities to manage the fire risk efficiently? 7

B. 7



From 80% to 99% molten urea is produced in Vacuum Evaporator which works at 60 cm Hg pressure and 135^0 C. Thereafter molten urea is sent to top of the Prilling Tower and allowed to falls from a rotating sieve bucket running with high rpm. These small droplets of molten urea are then converted into solid prills when come in contact with cooled air coming through natural draft from bottom of the prilling tower. Carryout HAZOP study and record finding in the given table when:

a. Less air flow from bottom of the prilling tower
b. Less vacuum in Vacuum Evaporator

Deviation	Causes	Consequences	Actions Taken	P	S	RL	Remarks

Q-2

A. Explain how a SMART decision of the management can change the complete scenario of fire damage. State important functions of risk management. 7

B. Name various types of hazard identification techniques generally used in a chemical industry. Draw FTA diagram for the fault "Fire explosion at oil fired heater". 7

Question-3

A. Carryout the Risk Assessment of the plant area shown in the figure of Q1B with identifying at ieast 5 nos. of high potentiai hazards. Record in the given tabie: 7

Activity	Hazards	Probability	Severity	Risk Level	Evaluation	Remarks

B. What are the key aspects to provide safe means of escape and means of firefighting at construction sites? 7

Q-4

A. Give overview of "Qualitative Fire Risk Assessment". Describe briefly the various ways to perform systematic Qualitative Fire Risk Assessment. 7

B. What is Risk Assessment and why it is so important? Who is authorized to conduct it and when? 7

P.T.O

N 22-2

Question-5	A. Ammonia gas is released from storage tank where following control equipment / devices are provided with a given probability: a. Online monitor : 90% chances of success to run b. Water curtain : 30% chances of failure c. Fire team response : 80% chances of reaching in time Construct an ETA to find out various probabilities of outcomes.	7
	B. Describe 5 step method to carry out a risk assessment.	7
Question-6	A. Explain the various techniques of reducing "Quantitative Fire Risk Assessment". What can be done if business risk still exists?	7
	B. What is Risk Matrix? Prepare a Risk Matrix diagram where the degree of risk is based on the level of the probability of occurrence and the severity of the consequences.	7
Q-7	A. What is the difference between Risk Assessment and Risk Management? Explain characteristics of risk management.	7
	B. Describe various hazards under some main subject.	7
Q-8	A. What are the major fire barriers between a fire source and fatality? Explain briefly.	7
	B. Explain the role of a senior manager and general public in fire safety risk management system?	7

Section-II

Question-9	MCQTick marks the correct option: 1. A risk control technique where severity of the event occurrence is reduced, is called: a. Elimination b. Prevention c. Mitigation d. Control of consequences 2. The consequences of fire scenarios can be assessed by using ..... under conditions that are specific to each fire scenarios. a. Risk Assessment b. Time Dependent Modelling c. Matrix Table d. All the above 3. Fire protection measures like, door self-closers, sprinklers and fire-resistant compartments are necessary to control ..... and to reduce its consequential risk. a. Fire Ignition b. Fire Growth c. Smoke spread d. Evacuation 4. A risk presentation technique which is constructed by calculating the risk for thousands of evenly spaced points on a map of the region surrounding the facility and then connecting all the points that have the same frequency of fatality is called: a. Graphical technique	8

N 22-3

b. Risk contouring
c. Contours of constant risk
d. All the above

5. 'Interruption to your supply chain' is an example of .....:
   a. Employee risk
   b. Operational risk
   c. Compliance risk
   d. Environmental risk
6. ..... assists in identifying failures with in a system, process or program and the information gathered helps to determine the best course of corrective actions:
   a. Risk Assessment
   b. HAZOP
   c. Safety audit
   d. SWIFT
7. A risk control technique where budget is allocated to cover the expected level of loss is called:
   a. Elimination
   b. Prevention
   c. Transferred
   d. Absorbed
8. The technique used to consider ways in which the basic components of a system can fail to perform their design intent is called .....:
   a. FTA
   b. ETA
   c. FMEA
   d. HAZOP