

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, December 2020

Course: Hazard Identification and Computer Aided Risk Analysis	Semester: VII
Program: B. Tech. FSE	Time 03 hrs.
Course Code: HSFS 4002	Max. Marks: 100

SECTION A

Each Question carries 5 Marks

S. No.	Question	CO
Q 1	Write the suitability of below mentioned method: a. FMEA b. What if Analysis c. HIRA	CO1
Q2	Write short note on: a. i-SAFE Index b. Environmental Stability Conditions	CO1
Q3	List prerequisites, data source and team of Preliminary Hazard Analysis.	CO2
Q4	List all loss control credit factors along with calculation steps.	CO2
Q5	Write step by step procedure of Event Tree Analysis.	CO1
Q6	Describe various strategies of Inherent Safety along with examples.	CO2

SECTION B

Each question carries 10 marks

Q 7	What is CEI? Explain uses of CEI. Write complete procedures for calculation of CEI.	CO3
Q 8	With the help of any practical scenario prove that, “failure probability values using minimum cut sets method is greater than the values of actual fault tree method”.	CO4
Q 9	Describe PROBIT methods for effect modelling and brief various technique available to find out probability using PROBIT values.	CO4
Q 10	Briefly discuss below mentioned points: 1. History of HAZOP with the help of two examples of accidents 2. Objectives of HAZOP 3. Procedure of HAZOP	CO4

	4. Advantages of HAZOP over other risk assessment tools.	
Q 11	Calculate the degree of hazard for given data: General process hazard factor = 17.2, Special process hazard factor = 4.8 MF ₁ = 4.8 (20%), MF ₂ = 7.9 (35%), MF ₃ = 10.25 (45%) and MF ₄ = 12.6 (remain)	CO3
Section C		
Each Question carries 20 Marks.		
Q12	A 2- inch nozzle fails on the bottom of the spherical vessel (capacity = 1.134×10^6 kg) allowing liquid chlorine to escape. Calculate: leakage size, CEI and HD for given Information: Pressure inside the cylinder = 332 kPa gauge, height of liquid = 600 cm, Density = 1458 kg/m ³ , Liquid releasing time = 0.25 hr, ambient air temperature = 34 °C, normal boiling point temperature = 241 K, Storage temperature = 41 °F, ERPG-1 = 3 mg/m ³ , ERPG-2 = 9 mg/m ³ , ERPG-3 = 58 mg/m ³ , Strength of Airborne Chlorine = 66.3 Kg/s, wind speed = 4.8 m/s.	CO5