Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, December 2021

Course: Hazard Identification and Computer Aided Risk Analysis **Semester: V**
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 short note on: a. i-SAFE Index b. Environmental Stability Conditions	**CO1**
Q 2	List prerequisites, data source and team of Preliminary Hazard Analysis.	**CO2**
Q 3	List all loss control credit factors along with calculation steps.	**CO2**
Q 4	Write step by step procedure of Event Tree Analysis.	**CO1**
Q 5	Describe various strategies of Inherent Safety along with examples.	**CO2**

SECTION B

Each question carries 10 marks

Q 6	What is CEI? Explain uses of CEI. Write complete procedures for calculation of CEI.	**CO3**
Q 7	With the help of any practical scenario proof that, "failure probability values using minimum cut sets method is greater than the values of actual fault tree method".	**CO4**
Q 8	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 4. Advantages of HAZOP over other risk assessment tools.	**CO4**
Q 9	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.

Q 10	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**
Q 11	Describe PROBIT methods for effect modelling and brief various technique available to find out probability using PROBIT values.	**CO4**