

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, July 2020

Programme: M. Tech. (Rotating Equipment)	Semester – II
Course Name: Safety and environmental issues in industry	Max. Marks : 100
Course Code: HSFS 7012	Duration : 3 Hrs.
No. of page/s: 02	

SECTION A

S. No.		Marks	CO
Q 1	Write, step by step calculation of Airborne Quantity for liquid release.	5	CO1
Q 2	Safety measures of compressor is very essential during operation and maintenance. List various safety measures for this purpose.	5	CO1
Q 3	Discuss with proper comments: a. “Installation of Inherent Safe strategy during industrial operation is expansive” b. “Safety engineers are enough to prevent industrial accident”	5	CO3
Q 4	Describe all safety strategies while making pipework layout	5	CO2

SECTION B

Q 5	Discuss various types of industrial accidents. Justify how workplace environment is important for safe industrial works? List all the factors associated with industrial accidents?	10	CO5
Q 6	Illustrate all the safety requirements for storage of flammable and combustible liquid in indoor as well as in outdoor.	10	CO3
Q 7	Find out the CEI and HD for given situation: A gas cylinder was stored at ambient temperature (95 ⁰ F). Chlorine vapor was releasing through a leakage. Data: molecular wt. = 35. Absolute pressure = 750 kPa; Diameter of hole = 15 mm; RPG 1 = 3 mg/m ³ ; ERPG 2 = 9 mg/m ³ ; ERPG 3 = 58 mg/m ³ .	10	CO4
Q 8	Brief the characteristics of Fixed-position layout. Describe advantages and limitations of fixed-position layout? Distinguish between product and process layout with suitable examples and diagram. Which layout is safer and how? Discuss the advantages and disadvantages of that particular layout.	10	CO3

SECTION-C

Q 9	Discuss all issues during installation of inherent safe strategy with suitable diagram. Which Inherent safe strategy is most useful for newly designed process industry and how? Compare it with other strategies using suitable examples. How inherent safety index is related to Industrial safety? During calculation, why maximum score of individual factors need to consider?	20	CO3, CO4
Q 10	a. How F&EI related to degree of hazard? Describe any two hazard survey techniques with advantages and Disadvantages. b. Estimate the degree of hazard for given data regarding hazard factor and material factor: General process hazard factor = 15.9, Special process hazard factor = 0 MF ₁ = 15.2 (15%), MF ₂ = 7.9 (35%), MF ₃ = 10.25 (25%) and MF ₄ = 13.6 (remain)	20	CO4, CO5