


<b>Name:</b>	
<b>Enrolment No:</b>	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, January , 2022**

**Course: Principles of Chemical Process Safety**  
**Program: M. Tech. (Chemical Engineering)**

**Semester: I**  
**Time: 3 hours.**  
**Max. Marks: 100**

**Course Code: CHPD7011**

**Instructions : Attempt all the questions**

**SECTION-A**

S. No.	Question	Marks	CO
Q1	What do you mean by hazard identification?	4	CO1
Q2	Describe in short layer of protection analysis	4	CO2
Q3	Define risk assessment	4	CO3
Q4	What do you mean by reliefs? Discuss in short	4	CO3
Q5	Discuss in details material safety data sheet	4	CO1

**SECTION-B**

Q6	Discuss in details fires and explosions	10	CO5
Q7	Discuss in details toxic release and dispersion model	10	CO4
Q8	Describe and discuss “event tree analysis” and “fault tree analysis”	10	CO5
Q9	Discuss in details how toxicants are eliminated from biological organisms	10	CO3

**SECTION-C**

Q10	Discuss in details the function of OSHA process management system. Discuss quantitative risk assessment	20	CO4
Q11	<p>Please evaluate what you think from the following case-study:</p> <p>A worker was sent to collect samples from a process plant at midnight, as there was a recent process upset. For a representative sample, flushing of the sampling line was carried out before taking the actual sample. The worker drained the flushing liquid into an open bucket which would then be disposed into a waste pit. When the worker failed to locate the hatch on the pit cover for proper disposal of the liquid, he decided to open the pit cover. While moving the pit cover, the worker knocked over the bucket. Contents from the bucket splashed onto his arms, neck and lower half of his face. The worker suffered from chemical burns as a result of the accident.</p> <p>What are the possible causes and contributing factors? What are recommendations and the learning points?</p>	20	CO5