Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, 2021

Course: HSE Management **Semester: VIII**
Program: B. Tech AP Upstream **Time 03 hrs.**
Course Code: HSFS 4001 **Max. Marks: 100**

Instructions: Please read all instruction carefully

SECTION A

S. No.	MCQ/TF type questions	**CO**
Q 1	Differentiate between coagulation and flocculation method in brief?	**CO1**
Q 2	Discuss the various stages in Oil spill management in brief? Which among these stages has the best efficacy?	**CO1**
Q 3	Prove the statement "PPE comes as the last resort"?	**CO1**
Q 4	State the Ground color band, First color band & Second color band for Ethylene glycol & Naptha?	**CO2**
Q 5	Factory" means any premises including the precincts thereof— a) whereon 50 or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on with the aid of power, or is ordinarily so carried on, or (b) whereon 30 or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on i) Give your assertion towards the above mentioned statement?	**CO2**
Q 6	State various physical, chemical & biological hazards in and oil drilling industry?	**CO1**

SECTION B (Short answers of one or two sentences)

Q 7	State and explain with suitable examples all the PSM 14 points and their benefits?	**CO2**
Q 8	A fire has occurred at a workplace and a worker has been badly injured (a) Outline the process for investigating the accident	**CO3**

	(b) Outline why the investigation report needs to be submitted to senior management. (c) In addition to senior managers, identify who may need to know the outcome of the investigation. OR Discuss salient features on Air/ Water and Solid waste pollution and their remedial and mitigation measures and techniques.	
Q 9	Personnel protective Equipment commonly referred to as PPE is the equipment worn to minimize exposure to variety of Hazards. Discuss the various types of PPE used in Industrial operation as per OSHA?	**CO2**
Q 10	Discuss the various safety and health issues pertaining the Hydrocarbon industry?(Take example of any three of the major processes deployed in the Crude oil Distillation)	**CO3**
Q 11	An explosion has occurred in your plant and an employee has been killed. An investigation shows that the accident was the fault of the dead employee, who manually charged the wrong ingredient to a reactor vessel. What is the appropriate response from the following groups? a. The other employees who work in the process area affected. **b.** The other employees elsewhere in the plant site. c. Middle management. **d.** Upper management. e. The president of the company. **f.** The union.	**CO5**
SECTION-C(Case studies)		
Q 12	The Bhopal, India, accident, on December 3, 1984, has received considerably more attention than the Flixborough accident. This is due to the more than 2000 civilian casualties that resulted. The Bhopal plant is in the state of Madhya Pradesh in central India. The plant was partially owned by Union Carbide and partially owned locally. The nearest civilian inhabitants were 1.5 miles away when the plant was constructed. Because the plant was the dominant source of employment in the area, a shantytown eventually grew around the immediate area. The plant pesticides. An intermediate compound in this process is methyl isocyanate (MIC). MIC is an extremely dangerous compound. It is reactive, toxic, volatile, and flammable. The maximum exposure concentration of MIC for workers over an 8-hour period is 0.02 ppm (parts per million). Individuals exposed to concentrations of MIC vapors above 21 ppm experience severe irritation of the nose and throat. Death at large concentrations of vapor is due to respiratory distress. MIC demonstrates a number of dangerous physical properties. Its boiling point at atmosphericconditionsis39.1°C,and it has a vapor pressure of 348 mm Hg at 20°C.Thevapor isabout twice as heavy as air, ensuring that the vapors will stay close to the ground once released. MIC reacts exothermically with water. Although the reaction rate is slow,with inadequate coolingthe temperature will increase and the MIC will boil. MIC storage tanks are typically refrigerated to prevent this problem. The unit using the MIC was not operating because of a local labor dispute. Somehow a storage tank containing a large amount of MIC became contaminated with water or some other substance. A chemical reaction heated the MIC to a temperature past its boiling point. The MIC vapors traveled through a pressure relief system and into a scrubber and flare system installed	**CO4**

	to consume the MICin the event of a release. Unfortunately,the scrubber and flare systems were not operating, for a variety of reasons. An estimated 25 tons of toxic MIC vapor was released. The toxic cloud spread to the adjacent town,killing over 2000 civiliansand injuring an estimated 20,000 more. No plant workers were injured or killed. No plant equipment was damaged i) Discuss the safety precaution to be taken which can prevent the accident from happening ii) Also discuss the root cause identified by you in the above disaster.	