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

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, 2020

Course: HSE Management — **Semester: VIII**
Program: B. Tech AP Upstream — **Time 03 hrs.**
Course Code: ENVO 401 — **Max. Marks: 100**

Instructions: Please read all instruction carefully

SECTION A

S. No.	MCQ/TF type questions	**Marks**	**CO**
Q 1	Which among these is an example of secondary air pollutant a) CO b) NO2 c) SPM d) Acid rain	**5**	**CO1**
Q 2	A hazard is any agent that can cause harm or damage to humans, property, or the environment. a) True b) False	**5**	**CO1**
Q 3	OISD 105 tells about permit to work system in Oil and Gas installation. a) True b) False	**5**	**CO1**
Q 4	MORT stands for a) Management overweight risk trend b) Management oversight and risk tree c) none of the above	**5**	**CO1**
Q 5	PEL value of H2S is a) 1ppm b) 5 ppm c) 2ppm d) 10ppm	**5**	**CO1**
Q 6	The most efficient air pollution control technique is a) Cyclone b) Venturi scrubber c) ESP d) All of the above	**5**	**CO1**
SECTION B (Short answers of one or two sentences)			
Q 7	Recognizing auditing as a powerful tool for managing and communicating HSE performance, organizations around the world are developing audit programs. What are the objectives of HSE Policy and HSE Audits?	**10**	**CO2**
Q 8	The plant has been down for extensive maintenance and repair. You are in charge of bringing the plant up and on-line. There is considerable pressure from the sales department to deliver product. At about 4 A.M. a problem develops. A slip plate or blind has accidentally been left in one of the process lines. An experienced maintenance person suggests that she can remove the slip plate without depressurizing the line. She said that she routinely performed this operation years ago. Since you are in charge, what would you do?	**10**	**CO3**

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 OR A fire has occurred at a workplace and a worker has been badly injured (a) Outline the process for investigating the accident (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.	**10**	**CO2**
Q 10	Discuss salient features on Air/ Water and Solid waste pollution and their remedial and mitigation measures and techniques.	**10**	**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.	**10**	**CO2**
SECTION-C(Case studies)			
Q 12	Title: Fire incident in Effluent treatment plant (ETP) at one of the Indian Refinery Location: Inlet sump of ETP Loss/ Outcome: One death and burn injuries to 5 persons BRIEF OF INCIDENT A fire incident took place in the inlet sump of the effluent treatment plant of a Refinery during a modification job. Six nos. of personnel suffered burn injuries during the incident and one of the victim succumbed to his injury six days later. OBSERVATIONS/ SHORTCOMINGS • Volatile Organic Compound (VOC) recovery system was under implementation at ETP. Half cylindrical arched roofs with side covers were placed over the top of the inlet sump (IS) to create a confined VOC chamber. Earlier, one spent caustic branch line (8" dia) to the ETP inlet sump was found obstructing the placement of the support structures for the VOC system. As this line was not in regular use, it was cut and removed as a temporary measure to facilitate installation of the VOC cover and structures. • Subsequently after completion of the VOC system project jobs, on the day of the incident, restoration of the earlier cut out line of the spent caustic line back to the VOC chamber sump was taken up for execution. Pre fabrication of the line section was done outside and was brought to site for fitting. • The subject job necessitated cutting of existing spent caustic line elbow, surface preparation, fit-up and welding of a flange on the existing spent caustic line to fix the fabricated line section. • The elbow cutting job was done using gas cutter just outside the covered VOC chamber. Gas testing was done prior to this job and LEL was found 'Nil'. During this operation, influent sump remained blocked by the side cover of the VOC collection chamber. • Hot permit was not taken for the above noted jobs near VOC chamber. Instead it was done under a composite hot permit issued for various projects related hot jobs for piping erection, fit-up, cutting etc. at ETP plant area.	**20**	**CO4**

	• Before welding of the pre-fabricated pipe spool flange (8" dia) to the cut out face of spent caustic line, it was decided to check the position of the line spool. Therefore, VOC cover was opened and spool was lifted manually to adjust & mark its position. Metal pipe and wooden blocks were used to lift and rest the line section. • Three persons were adjusting the new spool section at the edge of inlet sump, while three persons including one welder were working at the other end of the spool section for alignment of the piece with the cut out face of the spent caustic line. Provided for information purpose only. This information should be evaluated to determine if it is applicable in your operations, to avoid recurrence of such incidents. • While this activity was going on, a sudden flash fire broke out at site, which also engulfed the IS VOC sump. • Firefighting team responded promptly with two fire tenders and fire was extinguished within 8 minutes by applying foam. • Six personnel involved in the job at site suffered burn injury during the fire incident. One person subsequently succumbed to his injuries after 6 days. MBC replacement job carried out on the Maintenance Vessel. Loss/ Outcome: Fire took place on Maintenance Vessel and the incident resulted in four fatalities. BRIEF OF INCIDENT A fire incident had occurred on Maintenance Vessel. 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.		