Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Program Name: M. Tech (Petroleum Engineering) **Semester: 3rd**
Course Name: HSE challenges in petroleum operations **Time:** 03 hrs.
Course Code: HSFS8012 **Max. Marks:** 100
No. of Pages: 2

Instructions: 1) There is internal choice in section B & C **2)** In section C attempt either Q11 or Q12.

SECTION A (20 marks)

S. No.		Marks	CO
Q 1	List any eight important parameters to assess quality of produced wastewater?	**4**	**CO1**
Q 2	Define confined Space with examples?	**4**	**CO2**
Q 3	Expand the following abbreviations: PPE, LTIF, NORM, JHSC	**4**	**CO3**
Q 4	Elaborate the working principle of heat detector systems used in petroleum industry?	**4**	**CO4**
Q 5	Give suitable procedures for onshore well abandonment?	**4**	**CO2**
	SECTION B (40 marks)		
Q 6	Explain the technical issues which resulted in a) Piper alpha incident of 1988 and b) Deepwater Gulf of Mexico oil spill, 2010?	**10**	**CO2**
Q 7	a) Define HAZOP analysis? b) Explain advantages and disadvantages of HAZOP analysis with suitable examples in Oil & Gas Industry?	**4+6**	**CO3**
Q 8	State the difference between LC50 and LD50? Discuss the bioassay test Procedure for measuring the toxicity of drilling fluid and the reason for inconsistency of results.	**10**	**CO4**
Q 9	Elaborate any five principal environmental concerns that are important in your opinion related to the petroleum industry? Justify your recommendations? OR Discuss the impact of noise pollution in exploration and production?	**10**	**CO4**

SECTION-C (40 marks)			
Q 10	With respect to petroleum industry explain the following acts of Parliament (a) Oil Mines Regulation, 1984 (b) Hazardous Waste (Management & Handling) Rules – 1989 (c) Petroleum and Natural Gas Rules 2008 (safety in Offshore Operations) (d) Environment (Protection) Act, 1986 (e) Environmental Impact Assessment Notification, 2006	**20**	**CO1**
Q 11	a) A water treatment plant is to handle 600,000 bbl/d. Suppose that a coagulation/flocculation time of 30 min and a sedimentation time of 2 hr are required. Assuming three sets of tanks, each 60 ft long are to be used, the coagulation/flocculation tanks are 10 ft deep, and the sedimentation tanks are 15 ft deep, calculate the required widths. If the throughput per filter box is 0.05 bpm/ft^2 and if 12 units will be used, calculate the required filtration area per unit. b) A small "bug farm" is operated for bioremediation of produced sludge. Permit restrictions limit oil and grease in the soil to 10%. The bug farm contains 9.4 acres, and the measured oil and grease content is 4.1%. From a cleanup operation of a spill, 9470 yd^3 of oily sludge is produced. The oil and grease content of the sludge is 16.2%. The density of the sludge is 78 lb/ft^3, while the soil density in the 1ft-thick zone of incorporation is 91 lb/ft^3. Costs to move the sludge off-lease are large, so it is necessary to incorporate as much as possible within the facility. How much can be incorporated within permit limits?	**20** **20**	**CO4**
(OR)			
Q12	Discuss in detail remedial measures of offshore oil spill.	**20**	**CO5**