Name: **Enrolment No:**	UPES

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

Program Name: B.Tech (GSE) **Semester:** VIII
Course Name: Safety, Health & Environment Management **Time:** 03 hrs.
Course Code: ENVO 401 **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**	**CO3**
Q 2	Define confined Space with examples?	**4**	**CO4**
Q 3	Expand the following abbreviations: PPE, LTIF, NORM, JHSC	**4**	**CO5**
Q 4	What is 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	What were the technical issues with the accident a) Piper alpha incident of 1988 and b) Deepwater Gulf of Mexico oil spill, 2010?	**10**	**CO4**
Q 7	a) What is HAZOP analysis? b) Explain advantages and disadvantages of HAZOP analysis with suitable examples in Oil & Gas Industry?	**4+6**	**CO3**
Q 8	Enumerate the recommended procedures for entry into a confined space?	**10**	**CO1**
Q 9	What are the 5 (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**

<table>
<tr><th colspan="4">SECTION-C (40 marks)</th></tr>
<tr><td>Q 10</td><td>a) A group of wells produce a great deal of water that is ultimately discharged into a nearby estuary. Total flow into the estuary is restricted to a rate of 320 gpm with no more than 10 ppm oil and grease. An oil spill results in 50 bbl of oil being released out of the lease. Cleanup efforts recover 30 bbl of oil, with 20 bbl contained in a wastewater pond. Further reclamation will be costly and difficult. One alternative is to regulate the release of the oil with the water stream into the estuary. If oil flow can be controlled with the water, how long will it take to discharge the trapped oil under permitted conditions? Is this a practical solution?

b) Estimate the volume of clean H_20 required to dissolve an oil spill down to some acceptable limit from the following data:
Total volume of HC spill = 500 m^3
Density of oil = 800 kg/m^3
Density of pollutant H_2O zone = 0.2 kg/m3
Legal limit density (safe limit density) of polluted water = 5 x 10^{-6} kg/m^3
Also, if an aquifer is having a cross sectional area of 1,00,000 m^2 and the polluted water is flowing at the rate of 1 meter/day. How much time it will take to wash out all the oil? Comment on the result.</td><td>10+10</td><td>CO5</td></tr>
<tr><td>Q 11</td><td>The following are the different wastes that get generated during drilling and production activities. Give suitable methods used in the treatment?

<table><tr><td>Water Wastes</td><td>Solid wastes</td></tr><tr><td>suspended hydrocarbons</td><td>water</td></tr><tr><td>dissolved solids</td><td>Solidification</td></tr><tr><td>suspended solids</td><td>Air emissions</td></tr><tr><td>dissolved hydrocarbons</td><td>hydrocarbons</td></tr></table></td><td>20</td><td>CO4</td></tr>
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	SECTION B (40 marks)		
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Q 7	a) What is HAZOP analysis? b) Explain advantages and disadvantages of HAZOP analysis with suitable examples in Oil & Gas Industry?	**4+6**	**CO3**
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<tr><td>Q 10</td><td>c) A group of wells produce a great deal of water that is ultimately discharged into a nearby estuary. Total flow into the estuary is restricted to a rate of 320 gpm with no more than 10 ppm oil and grease. An oil spill results in 50 bbl of oil being released out of the lease. Cleanup efforts recover 30 bbl of oil, with 20 bbl contained in a wastewater pond. Further reclamation will be costly and difficult. One alternative is to regulate the release of the oil with the water stream into the estuary. If oil flow can be controlled with the water, how long will it take to discharge the trapped oil under permitted conditions? Is this a practical solution?

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