UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, April/May 2018

Course: Defect Assessment & Maintenance in Pipeline – I **Semester: II**
Program: M.Tech (PLE)
Time: 03 hrs. **Max. Marks: 100**

Instructions: All questions are to be answered. Question No: 9 and 11 have a choice in form of OR. One part is to be answered.

SECTION A

S. No.		Marks	CO
Q 1	You have to co-ordinate as central dispatcher .What is the various functions you will perform for coordination at Central Dispatch control room in pipelines.	**4**	**CO1**
Q 2	Quantify various types of defects that are observed in cross country pipelines	**4**	**CO2**
Q 3	Write the factors which accelerates corrosion in pipelines	**4**	**CO3**
Q 4	Explain the various reasons for the failure of pipelines. How the failures are assessed and prioritized?	**4**	**CO4**
Q 5	How do you carry out anomaly classification with IPS data collected & carry out the assessment of accuracy of result given by the vendor who has carried out survey?	**4**	**CO5**
	SECTION B		
Q 6	State the requirement or factors considered for the system design of the cross-country pipeline. Write down the equation for: a. Pressure loss calculation for laminar flow in crude pipelines. b. Pressure loss calculation for laminar flow in product pipelines. A pipeline was commissioned in 1970. The initial WT of a pipeline was 0.25 inches. The thickness recorded in the IPS of 1995 is 0.19 inches (pitting). The thickness at the same point was indicated as 0.11 in the IPS of 2000. Determine the following: 1. Long term corr. Rate 2. Short term corrosion rate 3. Residual time left f or the pipeline to leak.	**10**	**CO1**
Q 7	You are the maintenance–in-charge in company A for 16” diameter pipeline in ROW. Company B proposes to cross existing 16” diameter pipeline in company A ROW by laying 12” diameter pipeline. Describe the methodology for granting permission to company B for the same.	**10**	**CO2**

Q 8	How the assessment for repair / replacement of pipeline is carried out? Explain risk based inspection of pipeline & draw chart for same.	**10**	**CO4**
Q 9	What is galvanic table/chart? Draw the galvanic table (Practical Galvanic Series for materials in neutral soil with respect to CSE (copper sulphate half-cell))? For the two types of corrosion observed ie internal & external corrosion, state minimum 5 reasons for each corrosion & against each reason of corrosion, mention how the particular corrosion can be mitigated? OR What are the preparatory works carried out before taking up IPS run in the pipeline? What are the conditions for the re-run of IPS tool in pipeline?	**10**	**CO3** **CO5**
	SECTION-C		
Q 10	How corrosion in a metal occurs? What are the constituents of corrosion? What are the factors which accelerates corrosion in an object? How corrosion can be mitigated? What are the various types of surveys carried out to ascertain the health of the pipelines? Describe the various surveys carried out to assess the coating defects. How each survey differs from other method? Indicate the precaution required to be taken so that surveys are effectively carried out.	**20**	**CO3**
Q 11	a) What are the integrity checks for newly commissioned pipeline? How does it differ from pipeline at the end of its 25 years' service life? b) Explain the reasons for pipeline failure due to activities carried out during construction phase & pipe manufacturing at plant.. OR a) Describe in detail lining up of VLCC tanker and various marine operations associated with it. Operations b) Describe various types of pipeline losses encountered during pipeline transportations of hydrocarbons in submarine & on land pipelines.	**20**	**CO4** **CO2**