

Name:

Enrolment No:



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

Course: Defect Assessment & Maintenance in Pipeline – I

Semester: II

Program: M. Tech. PLE

Time : 03 hrs

Course code: CHPL 7006

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	Write the factors which accelerates corrosion in pipelines	4	CO3
Q 2	Various roles & functions of Central Dispatch in pipelines.	4	CO1
Q 3	Write down main components of SBM system and indicate its relevance with system. What is the function of pull back Tanker.	4	CO1
Q 4	Mention at least 10 defects observed in pipelines. Explain any two main defects.	4	CO2
Q 5	Explain the various types of corrosion observed in on-shore pipelines. Write down 5 codes used in repair / replacement of pipelines.	4	CO4

SECTION B

Q 6	a) What is galvanic table/chart? Draw the galvanic table with respect to CSE (copper-copper sulphate half-cell). b) There are two types of corrosion observed as internal & external in pipelines. State minimum 5 reasons for each corrosion & against each reason of corrosion, mention particular method for corrosion prevention. -	10	CO3
Q 7	a) Describe the working of receiving and launching barrel. Illustrate the purpose of magnetic, Bi-Di, brush and scrapper pigs. b) Illustrate the difference between, dents, gauge, and laminations. Under what conditions such defects can be very detrimental to pipeline.-	10	CO1
Q 8	What are the integrity checks for newly commissioned pipeline? How does it differ from pipeline at the end of its 25 years' service life? Mention in tabular form.	10	CO4
Q 9	Answer the following:	10	

	<p>a) Explain how pipeline optimization is carried out while designing of the pipeline.</p> <p>b) How is DCVG survey different form CIPS survey? At what stage DCVG survey is to be undertaken.</p> <p style="text-align: center;">OR</p> <p>Elaborate 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?</p>		<p>CO1</p> <p>CO3</p> <p>CO5</p>
SECTION-C			
Q 10	<p>A pipeline (18" Ø x 0.251"WT, pipe grade 5LX 55) is designed to operate at 114 KLS/hour. The pipeline length is 200 Km. It is proposed to install three numbers of motor driven centrifugal pumps in parallel at each pump station(2+1 combination) developing 55 Kg/cm² at a flow rate of 557 KLS/hour for increasing crude oil pressure (Sp.gr. 0.85). Minimum residual head required at downstream station is 5 Kg/cm². Pipeline profile is to be considered constant throughout the section. Assume temperature de-rating factor as 0.991, weld design factor as 1, construction design factor as 0.72, Reynolds Number as 1950. Assume any parameter if, required.</p> <p>1st case: Calculate:</p> <p>a) MAOP of pipeline</p> <p>b) No of pump stations required to meet above design consideration</p> <p>2nd Case : Change in profile gradient is observed as follows:</p> <ul style="list-style-type: none"> ➤ at 0 Km = 200 meters ➤ at 100 Km =300 meters ➤ at 200 Km =400 meters. <p>Calculate the requirement for change in pump stations with change of pipeline profile (other conditions remains same).</p>	20	CO1
Q 11	<p>a) What are the various factors responsible for failure of pipelines? How the assessment for repair / replacement of pipeline is carried out? Explain risk based inspection of pipeline & draw the chart.</p> <p>b) Elaborate pipeline failure consequences and major causes of pipeline failure.</p> <p style="text-align: center;">OR</p>	20	CO2

	<p>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 for completion of surveys effectively.</p>		CO4
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