UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Programme Name: M.Tech (PLE)   Semester   : III
Course Name   : Defect Assessment & Maintenance In Pipelines II   Time   : 03 hrs
Course Code   :   CHPL 8001   Max. Marks : 100
Nos. of page(s) :
Instructions:

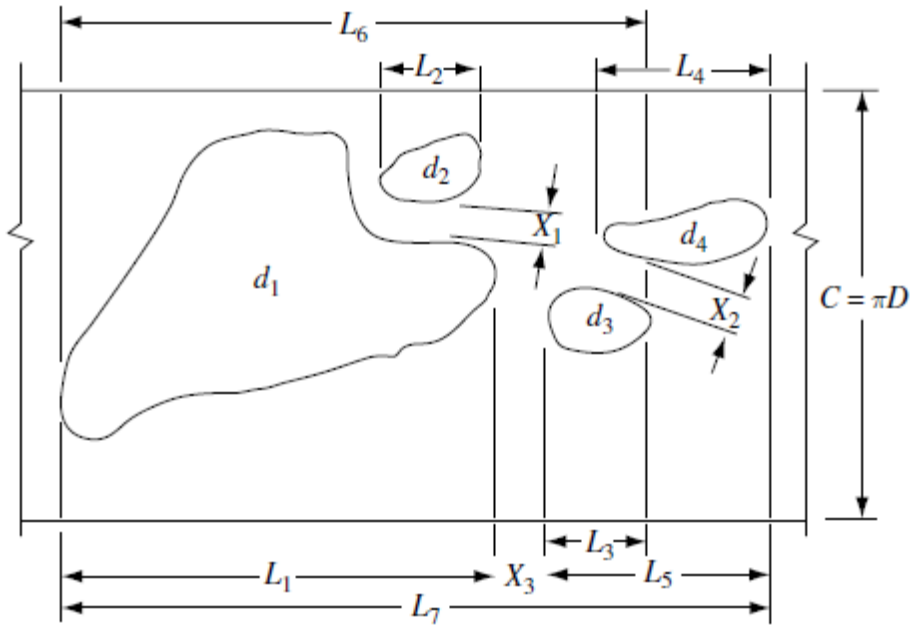|	SECTION A		
S. No.		**Marks**	**CO**
Q 1	How do you carry out the peel test of coating on pipeline?	4	CO2
Q 2	What are the various methods used for mitigation of AC/DC interference. Explain any two methods.	4	CO3
Q 3	Explain with a suitable diagram basic principle of Magnetic Flux Leakage (MFL) and ultrasound techniques used in ILI inspection.	4	CO6
Q 4	Brief on Four levels of assessment techniques for any flow detection observed in pipeline.	4	CO5
Q5	Procedure for determination of maximum allowable longitudinal extent of corrosion	4	CO6
	SECTION B		
Q 6	What is the effect of alloying elements with base metal and desired properties achieved with it? What is carbon equivalent and weld ability? Mention how to carry out the welding of pipe with weld ability as 0.8?	10	CO1
Q 7	How do you carry out the design of CP system of a 200 km length of pipeline & ascertain the location of anode beds.	10	CO3
Q 8	What are the various properties desired to be achieved with coating application? What are the pitfalls during coating applications?	10	CO2
Q9	Draw pictorial diagram for ICCP system. How do you regulate the PSP in pipeline through CP unit? Calculate CP ground bed resistance for vertical anode beds in parallel with following data's : i. Soil or (back fill) resistivity in ohms-cms 1000 ohms-cm ii. Number of anodes in parallel 4 Nos each iii. Length of back(anodes) fill in meters 2 meters iv. Diameter of back fill (anodes) in meters 0.3 meters v. Anode spacing in meters 3 meters	10	CO4

OR

Write short notes on:

      b) Procedure & inspection required to achieve effective field joint coating.   CO2

      c) Describe various methods to identify coating defects.   CO2

SECTION-C

Q 10

Several metal loss profiles of a corroded pipe is shown in the following sketch to examine the corroded pit interaction whether separate or interacting.

CO6

20

Complete the following table and show interaction among all the corrosion pits

Overall flaw length	Separate or Interacting	Conditions *	Maximum Depth	Conditions

*X =Distance of full wall thickness between metal loss areas (corroded regions).

Q11	Pressure testing of pipe with specification as size 10", wall thickness 0.279", grade API 5LX-52, Length: 5 miles is to be undertaken. Test pressure is 2,430 psig, and Temperature is 50F. Determine the incremental volume required by the pipe to reach from NTP to the test pressure and temperature. After 10 hours of pressure cycle, the test pressure, P has decreased to 2,422 psig and the temperature of the pipe and test water has decreased to 48F. Calculate the quantity of water to be added or drained out in the system to reach the test pressure.		CO4
	OR	20	
	Explain Microbiologically Influenced corrosion, classification of microorganisms, BIO FOULING observed in pipelines & Prevention of MIC.		CO5