



PRESIDENCY UNIVERSITY

BENGALURU

Roll No.													
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End - Term Examinations – MAY/ JUNE 2025

Date: 03-06-2025

Time: 09:30 am – 12:30 pm

School: SOE	Program: B. Tech in Petroleum Engineering	
Course Code : PET2020	Course Name: Process Pipeline Design	
Semester: VI	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05
Marks	10	10	40	40	NA

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	Define pipeline sizing.	2 Marks	L1	C03
2.	Define modulus of elasticity.	2 Marks	L1	C03
3.	State the various methods of leak detection in a pipeline.	2 Marks	L1	C03
4.	Define Schedule and Schedule number	2 Marks	L1	C03
5.	Recall Tracing of a pipeline.	2 Marks	L1	C03
6.	State the difference between LNG and CNG.	2 Marks	L1	C04
7.	Define NPV.	2 Marks	L1	C04
8.	Define SCADA system.	2 Marks	L1	C04
9.	State the importance of EIA studies for a pipeline.	2 Marks	L1	C04
10.	Identify the below expenses into Capex and Opex: Manufacturing plants, building improvements, property tax, R&D Expenses.	2 Marks	L1	C04

Part B

Answer the Questions.

Total Marks 80M

11.	The water is flowing through a pipe having diameters 20 cm and 10 cm at section 1 and 2 respectively. The rate of flow through pipe is 35 liters/s. The section 1 is 6 m above datum and section 2 is 4 m above datum. If the pressure at section 1 is 39.24 N/cm ² , Solve for the intensity of pressure at section 2.	10 Marks	L3	CO1
Or				
12.	At a sudden enlargement of a water main from 240mm to 480mm diameter, the hydraulic gradient rises by 10mm. Solve for the rate of flow.	10 Marks	L3	CO1
Or				
13.	Explain the significance of pump affinity laws in terms of variation with impeller speed and diameter.	10 Marks	L2	CO2
Or				
14.	Deciding on the number of pump stations required and the location of pumps are crucial aspects of designing efficient and reliable fluid transport systems, whether it's for water distribution, wastewater management, industrial processes, or other applications. Explain the basics of deciding the number of pump station required and location of pumps while establishing a long pipeline.	10 Marks	L2	CO2
Or				
15.	Solve for the line size to carry water flow of 60 m ³ /h, Temperature 300°C through a distance of 200 meters. Allowable velocity=2.4m/s. USE (a)Velocity Method (b)Kent Method. Assume density of fluid=1026kg/m ³	7+8 Marks	L3	CO3
Or				
16.	Explain the different pipeline sizing methods and Solve for the pressure loss of a pipe of 4 inch diameter carrying of water flow of 60m ³ /h, temperature 300°C through a distance of 200 meters. The pipe material is Cast Iron with an absolute roughness 0.25 mm. Take C for cast iron =150, by using the Hazen – William Equation.	5+10 Marks	L3	CO3
Or				
17.	Discuss your understanding of Pipeline inspection Gauges (PIGs). Explain their types, mode of operation, design and working in detail.	15 Marks	L2	CO3
Or				

18.	Discuss the importance of coating of a pipeline. Discuss about various types of coatings in detail.	15 Marks	L2	C03
19.	State your understanding of economic diameter of pipeline with expression. A pipeline has to transport crude oil from Gandhar field to group gathering Station (GGS). Solve for the economic diameter of pipeline (inch) to transport the crude oil having following properties: mass flow rate 0.166 lb/min, density of fluid 0.85 kg/m ³ , with a viscosity of 4cp.	5+10 Marks	L3	C04
Or				
20.	Discuss in detail about Net PRESENT VALUE (NPV) and idea of PRESENT WORTH OF UNIFORM SERIES in detail with expressions. If \$950 is to be received seven years from now, Solve for its worth if the time value of money is defined by 8% interest compounded annually.	5+5+5 Marks	L3	C04
21.	Valves are essential components that enable the safe, efficient, and reliable operation of pipeline systems. Define Valves. Discuss about the various types of valves their advantages and disadvantages in detail.	15 Marks	L2	C04
Or				
22.	Explain the concept of feasibility studies in project management. Describe the activities performed during feasibility studies.	15 Marks	L2	C04