Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination Decemeber20

Programme Name: M. Tech (PLE) **Semester: III**

Course Name : Pipeline Network Analysis

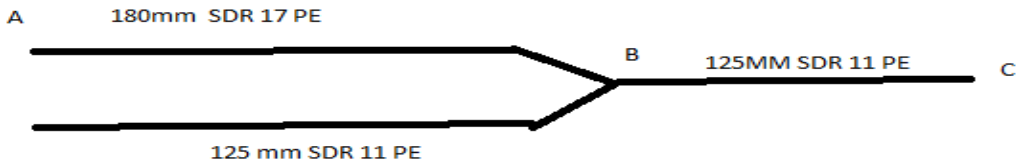
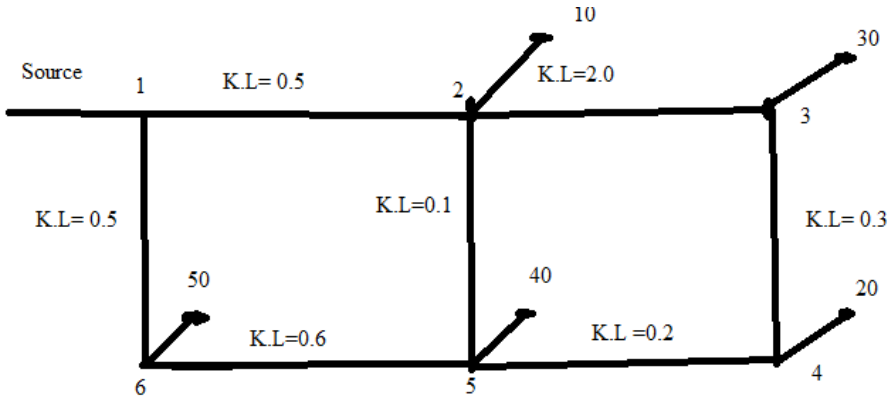
Course Code : CHPL 8004 **Max. Marks: 100**

Nos. of page(s) :2

Instructions:

SECTION A (5x6=30)

S. No.	Short Notes	Marks	CO
1	List number of facilities in CGS	5	CO1
2	What are input parameters in gas network?	5	CO4
3	Derive equation for equivalent length for series pipeline	5	CO4
4	What are benefits of PNG?	5	CO1
5	Define spanning tree in graph with the diagram	5	CO4
6	Differentiate between Hardy cross method and newton nodal method	5	CO3
	SECTION B (10x5=50)		
7	Draw CGD block diagram	10	CO1
8	Explain network topology with diagram	10	CO3
9	A natural gas transmission line transports 30 million m3/day of gas from a processing plant to a compressor station site 100 km away. The pipeline can be assumed to be along a flat terrain. Determine the minimum pipe diameter required such that the maximum pipe operating pressure is limited to 8500 kPa. The delivery pressure desired at the end of the pipeline is a minimum of 5500 kPa. Assume a pipeline efficiency of 0.95. The gas gravity is 0.65, and the gas temperature is 18°C. Use the Weymouth equation considering a base temperature = 15°C and base pressure 101 kPa. The gas compressibility factor Z = 0.92. $$Q = 3.7435 \times 10^{-3} E \left(\frac{T_b}{P_b}\right)\left(\frac{P_1^2 - e^s P_2^2}{G T_f L_e Z}\right)^{0.5} D^{2.667}$$	10	CO2

10	Explain transient analysis in detail.	**10**	**CO5**
11	Calculate equivalent length of complete section L_{AB} =250m ; L_{BC} =195m 	**10**	**CO4**
SECTION-C (20x1=20)			
12	For a pipe networks giving KL values of networks as shown in figure . Find the flow rates in each pipe using Hardy Cross method. All loop directions are taken clockwise are positive. Carry out two full iterations 	**20**	**CO4**