Name: Enrolment No:	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, August 2020 (Online Mode)

Course: Oil and Gas Engineering Software   **Semester: VIII Sem**
Program: B. Tech APE Gas   **Time 03 hrs.**
Course Code: PTEG467   **Max. Marks: 100**
Instructions: For MCQ there is only one correct answer

SECTION A

S. No.		Marks	CO
Q 1	Calculate the volume in cubic feet present in 1 lb-mol at standard condition.	4	CO1
Q 2	Calculate the apparent molecular weight of a natural gas mixture that has 85% methane, 9% ethane, 4% propane, and 2% normal butane.	4	CO1
Q 3	A natural gas mixture consisting of 90% methane, 8% ethane, and 2% propane. Calculate the specific gravity of the gas mixture.	4	CO1
Q 4	Unit of kinematic viscosity is same for FPS and SI system (True/False)	4	CO1
Q 5	The bulk modulus of a liquid is a measure of its -------- (Fill in the blanks)	4	CO1
Q 6	Define compression ratio of a compressor with proper units of measurement	4	CO2
Q 7	The crude oil can be defined using a TBP curve (True / False)	4	CO2
Q 8	It is thermodynamically not possible to form hydrate as given by PIPEPHASE software when the hydrate curve lies A. To the left of the operating line of the fluid B. To the right of the operating line of the fluid C. None of the above.	4	CO2
Q 9	'Total amount of fluid passing through any section of a pipe is fixed.' This statement is best defined by A. Bernoulli's equation B. Darcy equation C. Colebrook equation D. None of the above	4	CO2
Q 10	Pressure recovery for venturi-meter is more than orifice meter (True / False)	4	CO2
Q 11	Write the equation for maximum erosional velocity of gas in a pipeline.	4	CO3
Q 12	What is the Reynolds number range when the gas flow is termed as critical flow	4	CO3

Q 13	Write the equation for Darcy friction factor f in laminar flow region.	4	CO3

Q 14	In a compressor the work done required will be minimum for
	    A. Isothermal process
	    B. Polytrophic process
	    C. Adiabatic process
	    D. None of these
		4	CO4

Q 15	With increasing Schedule Number in a Pipe
	    A. OD increases
	    B. OD remains same
	    C. Thickness increases then decreases
	    D. ID increases
		4	CO4

	SECTION B		
Q 16	Mention the major parameters related to city gas distribution network design	8	CO3
Q 17	Describe point wise the steps involved in hydrate study calculation in Pipe phase software	10	CO4
	SECTION C		
Q 18	A gas pipeline, NPS 20 with 1 in. wall thickness, transports natural gas (specific gravity = 0.6) at a flow rate of 250 MMSCFD at an inlet temperature of 60°F. Assuming isothermal flow, calculate the velocity of gas at the inlet and outlet of the pipe if the inlet pressure is 900 psig and the outlet pressure is 750 psig. The base pressure and base temperature are 14.7 psia and 60°F, respectively. Assume compressibility factor $Z = 1.00$. What is the erosional velocity for this pipeline based on the above data and a compressibility factor $Z = 0.90$? Applicable equations are as below. Use proper units. $$u_1 = 0.002122\left(\frac{Q_b}{D^2}\right)\left(\frac{P_b}{T_b}\right)\left(\frac{Z_1 T_1}{P_1}\right)$$ 1) Calculate velocity at outlet by proportions 2) Calculate erosional velocity	22	CO5