Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 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	Define specific gravity for a gas	3	CO1
Q 2	What is the standard pressure and temperature condition? Use proper units of measurements.	3	CO1
Q 3	What is the unit of relative roughness (ε)?	3	CO1
Q 4	Define the term "steady state" condition	3	CO1
Q 5	Differentiate between open system and closed system in thermodynamics.	3	CO1
Q 6	Calculate the apparent molecular weight of a natural gas mixture that has 85% methane, 9% ethane, 4% propane, and 2% normal butane.	3	CO1
Q 7	Mention the relation between fanning friction factor and Darcy friction factor	3	CO1
Q 8	Name the simplest equation of states.	3	CO2
Q 9	State the Bernoulli's theorem and write the Bernoulli's equation with proper mentioning of each term	3	CO2
Q 10	Define compression ratio of a compressor with proper units of measurement	3	CO2
Q 11	Pressure is a vector quantity (True / False)	3	CO2
Q 12	Pressure recovery for venturimeter is more than orifice meter (True / False)	3	CO2
Q 13	Methanol is used for hydrate inhibition (True / False)	3	CO2

Q 14	Compressibility factor (z) is not a measure of non-ideality (True / False)	**3**	**CO2**
Q 15	In a compressor the work done required will be minimum for A. Adiabatic process B. Isothermal process C. Polytrophic process D. None of these	**3**	**CO3**
Q 16	Friction factor is calculated by E. Darcy equation F. Colebrook equation G. Fourier's equation H. None of these	**3**	**CO3**
Q 17	For multiphase flow I pipeline delta P is calculated using A. Darcy equation B. Beggs & Brill equation C. Ergun equation D. Fourier's equation	**3**	**CO3**
Q 18	Nominal Pipe size (NPS) or Nominal diameter (ND) is equal to Outer diameter (OD) A. below12 inch ND B. Above 12 inch ND C. Equal & below 14 inch ND D. Equal & Above 14 inch ND	**3**	**CO4**
Q 19	With increasing Schedule Number in a Pipe A. OD increases B. ID increases C. OD remains same D. Thickness increases then decreases	**3**	**CO4**
Q 20	Normal Boiling point is measured at A. 14.7 psig B. 0 barg C. 1 psig D. 1 barg	**3**	**CO4**
SECTION B			
Q 21	Discuss point wise the City gas distribution network design procedure	**10**	**CO3**
Q 22	Describe point wise the steps involved in pressure drop calculation for "Network model with composition" in Pipephase software	**10**	**CO4**
SECTION-C			

Q23	A gas pipeline, NPS 20 with 0.500 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 1000 psig and the outlet pressure is 850 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. $u_1 = 0.002122\left(\frac{Q_b}{D^2}\right)\left(\frac{P_b}{T_b}\right)\left(\frac{Z_1 T_1}{P_1}\right)$ $u_{max} = 100\sqrt{\frac{ZRT}{29GP}}$ 1) Calculate velocity at outlet by proportions 2) Calculate erosional velocity	**20**	**CO5**