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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2018

Program	: B. Tech (APEG)	Semester	: VI
Subject (Course)	: Natural Gas Processing	Max. Marks	: 100
Course Code	: PTEG 363	Duration	: 3 Hrs
No. of page/s	: 2		

Instructions:

1. All questions in section A, B and C are compulsory.
2. Marks for questions are indicated against each question

Section-A			
S. No.		Marks	CO
1.	Write the different selection criterion of NGL recovery processes.	(6)	CO3
2.	What are the emerging technologies in utilization of synthesis gas and methane for the production of petrochemicals?	(6)	CO4
3.	List the advantages and disadvantages of solid bed sweetening process.	(6)	CO2
4.	Mention the different carbonate processes used for gas desulfurization with the name of the activator used in each process.	(6)	CO2
5.	What are the process variables that must be considered for designing components in adsorption dehydration plant?	(6)	CO1
Section-B			
6.	Explain the regeneration cycle of the adsorption dehydration plant with the help of typical temperature-time curve.	(10)	CO1

7.	Explain the LO-CAT process using process flow scheme with all the chemical reactions involved.	(15)	CO2
8.	<p>a) Write the salient features of the mechanical refrigeration plant used for NGL recovery</p> <p>b) Draw the thermodynamic path followed by the gas in mechanical refrigeration process vis-à-vis with Joule Thompson and Turbo-Expander processes using phase envelope.</p>	(5)+(5)	CO3
9.	Draw and explain the process flow scheme used to produce synthesis gas and ultimately ammonia, using natural gas a feedstock.	(15)	CO4
Section-C			
10.	<p>a) Why fractionation is important for NGL production?</p> <p>b) A gas mixture containing 15% mole A and 85% mole inerts is fed to an absorption tower where it is contacted with liquid solvent B which absorbs A. The mole ratio of solvent to gas entering tower is 2:1. The gas leaving the absorber contains 2.5% mole A, 1.5% mole B, and the rest inerts.</p> <p>Find</p> <p>(a) Percentage recovery of solute A</p> <p>(b) Fraction of the solvent B fed to a column lost in gas leaving the tower.</p> <p>Note that during the process, some solvent evaporates and gets added in the gas leaving the tower.</p>	(5)+(15)	CO3