

University : Mansoura
Faculty : Engineering
Department : Mech. Power Eng.
Grade : Fourth year

Module: Natural Gas Tech.
Final Exam : 29/5/2013
Time allowed : (3) hours

Answer the following questions :-

- 1- A) Discuss briefly both of the " cascade process " and the " pre-cooled mixed refrigerant process " and their functions . Flow diagram for each process is required .
B) Illustrate briefly the successive phases of extracting " NGLs " from natural gases . What are the main functions of the fractionation units typically utilized in this system .
C) The " LNG " liquefaction plant is divided into two independent trains operating in parallel process . Nominate these two trains and show diagrammatically the components of each one .
D) Tabulate the major components of the natural gas .

- 2- A) Discuss and illustrate diagrammatically the essential steps to be implemented in production of liquid fuels from natural gas based on the original fisher – Tropsch chemical process .
B) What are the present characteristics that make the " LNG " to be viable option versus pipeline transport .
C) Define the following terms :-
Lean gas , Rich gas , LNG , LPG , NGL , Condensates , Sour gas , inert gases , and GTL .
D) Classify The main hydrocarbon reserve categories being issued by the American Petroleum Institute (API) and recently considered in and gas industry.

- 3- A) Natural gas is one of petroleum compounds . Pressure and temperature relationships are particularly important in the production of natural gas . Discuss this issue in details illustrating your answer by schematic presentation .
B) Natural gas converted into syngas can be processed into feedstock for a variety of petrochemicals and fertilizers . Illustrate the chemical reaction contributing to the production of methanol and outline its role in the field of petrochemical industry and show schematically the variety of petrochemical obtained from both the natural gas and crude oil .
C) Mention the main factors and Considerations controlling the necessity for natural gas production and processing clarifying your answer by schematic layout of gas plant .

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