

Seat No.	
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B.E. (Mechanical) (Semester - VIII) Examination, April - 2016

CRYOGENICS

Sub. Code : 49425

Day and Date : Tuesday, 26 - 04 - 2016.

Time : 03.00 p.m. to 06.00 p.m.

Total Marks : 100

- Instructions :**
- 1) Attempt any three questions from each section.
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data and assumptions if required.

SECTION - I

- Q1) a)** What is Cryogenics? Explain the role of cryogenic fluids in engineering field. Show the position and range of the cryogenic temperature on logarithmic scale. [8]
- b) Explain the behavior of materials at low temperatures in terms of their mechanical and thermal properties. [8]
- Q2) a)** Draw schematic diagram of an Ideal liquefaction system, also represent it on T-S diagram and develop expression for work requirement per unit mass of gas compressed. [10]
- b) Give a brief account of electrical and magnetic properties on the material over cryogenic temperature range? [8]
- Q3) a)** What are the different pay off functions to indicate the performance of liquefaction systems. [4]
- b) Explain the different principles used in production of low temperatures. [8]
- c) What is the difference between liquefaction system and refrigeration system. [4]
- Q4) a)** Give detailed classification of Pulse Tube Cryocooler. [8]
- b) Explain the working of a Stirling/Philips refrigeration system with the help of a schematic diagram and T-S plot and write expression for its COP. [8]

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SECTION - II

- Q5) a) Discuss the principles of Gas Separation. [8]
b) Explain with neat sketch Linde single column separation system. [8]
- Q6) a) With help of a diagram explain the principle and working [8]
i) Constant volume gas Thermometer.
ii) Magnetic Thermometer.
b) Explain cryogenic liquid level measurement by using [8]
i) Electrical Resistance gauge.
ii) Capacitance liquid level probes.
- Q7) a) Draw a neat sketch of Dewar Vessel and explain the functions of elements [8]
of the vessel.
b) State the various types of insulations used in cryogenic-fluid storage [8]
vessel and explain any two of them.
- Q8) Write short note on (Any Three) [18]
a) Cryogenics in space Technology.
b) Cryogenics in Biology.
c) Cryogenics in Medicine.
d) Super conducting Devices.

