

SV-111

Total No. of Pages : 2

Seat No.	
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B.E. (Mechanical) (Semester - VIII)
Examination, May - 2018
CRYOGENICS (Elective - IV)
Sub. Code : 68519

Day and Date : Wednesday, 16 - 05 - 2018

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Make suitable assumption if necessary and mention them clearly.

- Q1) a) Define Cryogenics. What are the ideal properties of cryogenic fluids? [6]
- b) Discuss the Thermal properties of cryogenic material at cryogenic scale. [5]
- c) Explain with suitable example use of cryogenic technology in space application. [5]
- Q2) a) What is FOM and pay off functions to indicate the performance of liquefaction system? How they are related. [6]
- b) Solve any Two of following: [10]
- i) Explain Principles of Joule Thomson Expansion and Adiabatic expansion.
 - ii) Explain with neat sketch precooled Linde Hampson system of liquefaction.
 - iii) Differentiate between Simple Linde Hampson system and precooled Linde Hampson system.

P.T.O.

Q3) Write short notes on (any three):

- a) Superconducting devices.
- b) Cryogenics in bio medical application.
- c) Pulse Tube Cryocooler.
- d) Helium generated Hydrogen liquefaction system.
- e) Claude system for liquefaction of Hydrogen.

Q4) a) Explain with neat sketch ideal refrigeration system also discuss the Sterling regenerative heat exchanger cycle, using T - S diagram. [6]

b) Explain the working of Pulse Tube refrigeration system with the help of schematic sketch. [5]

c) Draw the neat sketches of Solvay and G - M refrigeration systems. [5]

Q5) a) Explain with a neat sketch the Dewar vessel of cryogenic fluid storage. [6]

b) Solve any Two of the following: [10]

i) Temperature composition diagram.

ii) Turbine flow meter.

iii) Magnetic thermometer.

Q6) Write short notes on (any three):

[18]

- a) Components of vacuum systems.
- b) Capacitance liquid level probe for cryogenic liquid level measurement.
- c) Principles of rectifier column.
- d) Single column and double column air separation systems.
- e) Insulation used in cryogenics.

