

Total No. of Questions : 12]

SEAT No. :

P1537

[4759]-50

[Total No. of Pages : 3

B.E. (Mechanical)

CRYOGENICS ENGINEERING

(2008 Course) (Semester-II) (Open Elective) (402050)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) Answer any three questions from each section.*
- 2) Answer for the two sections should be written in separate answer book.*
- 3) Neat diagrams should be drawn wherever necessary.*
- 4) Figures to the right indicate full marks.*
- 5) Use of pocket calculator & different gas charts as applicable is allowed.*
- 6) Assume suitable data if necessary.*

SECTION-I

- Q1)** a) Define cryogenics. State important applications of Cryogenics. [6]
- b) What are the important landmarks in the field of Cryogenics? [6]
- c) What are permanent gases? State boiling points for the gases viz. Helium, Hydrogen, Nitrogen, Oxygen. [6]

OR

- Q2)** a) Explain with neat sketch Super-fluidity phenomena observed in case of liquid Helium. [6]
- b) Explain effect of cryogenic temperature on thermal properties of material. [6]
- c) Explain the effect of Cryogenic temperature on mechanical strength of materials. [6]
- Q3)** a) Explain ideal liquefaction system and different parameters used to define the system performance. [6]
- b) Draw Simple Linde Hampson system and label all the components. [4]
- c) Explain inversion curve with neat diagram. What is maximum inversion temperature. [6]

OR

P.T.O.

- Q4)** a) Why Pre cooling is necessary in case of Precooled Linde Hampson system. [6]
b) Compare Isenthalpic and Isentropic expansion methods employed for cooling. [6]
c) Discuss how Cryogenic liquefaction system is different from Cryogenic refrigeration system. [4]

- Q5)** a) State importance of regenerator effectiveness in Stirling cycle refrigerator. [8]
b) Explain with neat sketch Philips Refrigerator. [8]

OR

- Q6)** a) What are the different techniques employed for separating of gases. [8]
b) Explain Gifford McMahon Refrigerator with neat sketch. [8]

SECTION-II

- Q7)** a) State various insulations used in Cryogenics in increasing order of performance. Explain any one of them. [6]
b) Explain with neat sketch principle of rectification column. [10]

OR

- Q8)** a) Explain the theoretical plate calculations using McCabe-Thiele technique. [8]
b) Compare Cryogenic separation with other gas separating methods. [8]

- Q9)** a) Discuss various methods used to drain liquid from Dewar vessel. [9]
b) Explain construction of Dewar vessel with neat sketch stating function of each component. [9]

OR

- Q10)** a) Discuss the role of Vacuum in Cryogenic. [6]
b) What are the different safety devices installed on a Dewar vessel. [12]

- Q11)** a) Explain the Meissner effect and state its applications. [6]
- b) What are the different present day applications of Cryogenics in the medical field. [6]
- c) What are the different applications of Cryogenics in the field of Space Technology. [4]

OR

- Q12)** a) Explain any two of following present day applications of Cryogenics in the field of [8]
- i) Food preservation.
- ii) High Energy Physics.
- iii) Gas industry.
- b) Explain the cryogenics principle used in recycling of automobiles tyres. [8]

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