Total No. o	of Question	s:12
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SEAT No.:			
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B.E. (Mechanical)

CRYOGENIC ENGINEERING

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

Time: 3 Hours] [Max. Marks: 100

Instructions to the candidates:

- 1) Answer three questions from each Section.
- 2) Answers to the two sections should be written separate books.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Figures to the right indicates full marks.
- 5) Use of logarithmic tables, Mollier charts, electronic pocket calculator is allowed.
- 6) Assume suitable data if necessary.

SECTION - I

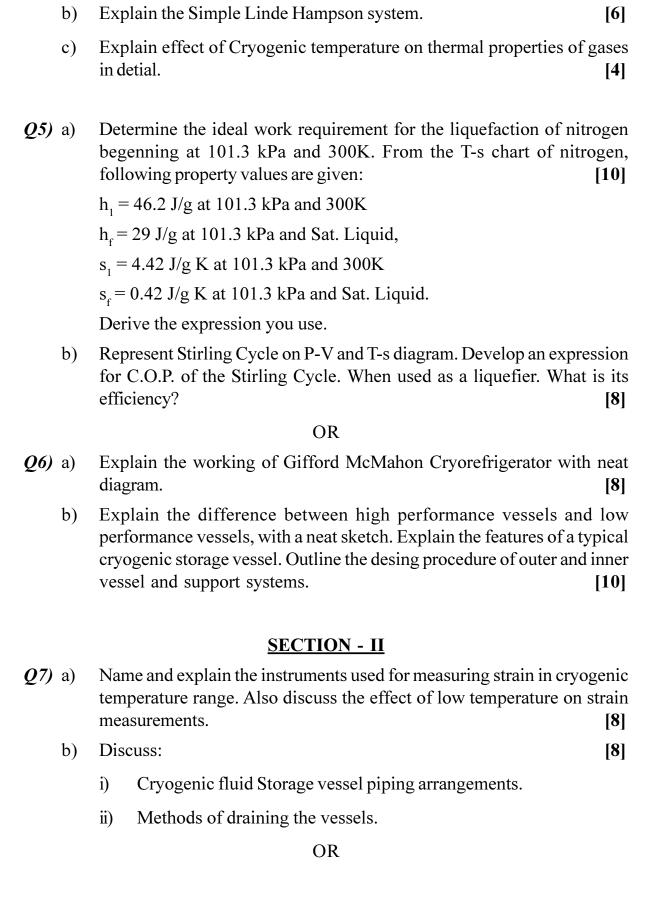
- **Q1)** a) Explain the working and thermodynamic analysis of Linde system with the help of neat diagram and develop the expression for liquid yield. [10]
 - b) Explain, briefly the variation of thermal properties of solids in cryogenic range of temperature. [6]

OR

Q2) Write Short Notes on:

[16]

- a) Meissner Effect.
- b) Collins Heat Exchanger.
- c) Vacuum shielded vessels.
- d) Kapitza System.
- Q3) a) State the different landmarks in the history of Cryogenics since its inception.[4]
 - b) Explain the concept of Superconductivity observed at Cryogenic temperature. [6]
 - c) State with neat sketch Super-fluidity phenomena observed in case of liquid Helium. [6]



What are the system performance parameters in liquefaction systems. [6]

Q4) a)

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Q8) a) Discuss the statements:

- [10]
- i) One of the most critical components in any liquefaction system is the heat exchanger Why?
- ii) Heat exchanger effectiveness should be always more than 0.869 why? Explain.
- b) Explain in detail, what is meant by J-T effect and Inversion Curve. [6]
- **Q9)** a) Explain, briefly the variation of thermal properties of solids in cryogenic range of temperature. [8]
 - b) Explain in detail, what is meant by J-T effect and Inversion Curve. [8]

OR

- Q10)a) Explain different present day applications in the field of Cryogenics.[8]
 - b) Explain the cryogenics principle used in recycling of automobiles tyres. [8]
- **Q11)**Discuss the problems and scope of cryogenic instrumentation. Explain with neat sketches the instruments used for cryogenic measurements of [18]
 - a) Strain,
 - b) Flow
 - c) Liquid level
 - d) Temperature.

OR

- Q12)a) Explain with neat sketches the working of different compressors and expanders used in cryogenic practice. [12]
 - b) Discuss the effect of compressor and expander efficiency on system performance. [6]

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