R09

Code No: D9109

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY-2012
CRYOGENIC ENGINEERING
(HEATING VENTILATION & AIR CONDITIONING)

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks

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1.a) Derive the expression for minimum work required to liquefy the gasses.
b) With the help of a neat sketch explain the working principle of pre-cooled linde hampson system.

2.a) With the help of a neat sketch explain the working principle of Simon liquefaction system.
b) With the help of a neat sketch explain the working principle of Kapitza system.

3.a) With the help of a neat sketch explain the working principle of Linde double column system and explain in what way it is advantageous over Linde single column system.
b) With the help of a neat sketch explain the working principle of Dewar Vessel.

4.a) With the help of a neat sketch explain the working principle of JT Cooler in a cryostat.
b) With the help of a neat sketch explain the usage of cryogenic fluids In Space Technology applications.

5.a) With the help of a neat sketch explain the usage of cryogenic fluids In Gas Industry applications.
b) With the help of a neat sketch explain the working principle of separation of Deuterium from Hydrogen.

6.a) Explain the working principle of gas separation by condensation phenomenon.
b) Explain how the gasses will be purified by Refrigeration method.

7.a) Explain how cryogenics is used in blood preservation and in bone marrow preservation.
b) List out the properties of Liquid Nitrogen and its applications.

8.a) Define Joule Thomson co-efficient and prove that its value must be positive for the production of cooling effects by throttling process.
b) Explain how the separation of Helium Isotope is carried out in a Thermal Diffusion Column.

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