Code No.: 9A03604/R09

Set-2

B.Tech III Year II Semester Regular & Supplementary Examinations

April/May - 2013

REFRIGERATION AND AIR CONDITIONING

(Mechanical Engineering)

Time: 3 Hours | Max. Marks: 70

*Answer any **FIVE** Questions*

*All Questions carry **equal** marks*

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1. (a) Name five means of producing refrigeration.

   (b) Derive an expression for C.O.P of air refrigeration system working on Bell-Coleman cycle.

2. (a) State the functions of the following parts of a simple vapour compression system.

   (i) Compressor

   (ii) Condenser

   (iii) Expansion valve

   (iv) Evaporator.

   (b) A heat pump using NH_3 as the refrigerant operates between saturation temperature of 6ºC and 38ºC. The refrigerant is compressed isentropically from dry saturated and there is a 6 K of under cooling in the condenser. Calculate,

   (i) C.O.P

   (ii) The mass flow of refrigerant/kW power input

   (iii) The heat available per kW power input.

3. (a) What specific characteristics required for lubricating oil when the refrigerant used:

   (i) NH_3

   (ii) SO_2

   (iii) CO_2.

   (b) Name various methods commonly used for leak detection of various refrigerants.

4. (a) With the help of a neat sketch explain, the working of an industrial vapor absorption refrigeration system.

   (b) Describe the properties of aqua-NH_3 which are useful for the analysis of vapor absorption system.

5. (a) What is the situation under which the steam jet refrigeration system is recommended? What are its limitations? Can it be used for obtaining subzero temperatures?

   (b) Explain the various components of steam jet refrigeration system and clearly discuss the function of each component.