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B. Tech. 7th Semester (ME) F. Scheme Examination,

December-2017

REFRIGERATION AND AIR CONDITIONING

Paper-ME-403-F

Time allowed : 3 hours] [Maximum marks : 100

Note : Question No. 1 is compulsory. Students have to attempt five questions in total at least one from each section.

1. (a) Define the C.O.P. 5
- (b) What is multistage compression refrigeration system ? 5
- (c) What is solar radiation ? 5
- (d) What is Humidity Sensor ? 5

Section-A

2. Explain the classification, Nomenclature, Desirable properties of refrigerant in detail. 20
3. (a) What are different Methods of refrigeration ? 10
- (b) Explain the fundamental of air conditioning in detail. 10

Section-B

4. In an ammonia vapour compression system, the pressure in the evaporator is 2 bar. Ammonia at exit is 0.85 dry and at entry its dryness fraction is 0.19. During compression the work done per kg of ammonia is 150 kJ.

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Find out cop and the volume of vapour entering the compressor per minute if the rate of ammonia circulation is 4.5 kg/min. The latent heat and specific volume at 2 bar are 1325 kJ/kg and 0.58 m³/kg respectively. 20

5. A vapour compression system with ammonia as the refrigerant works between pressure limit of 2 bar and 12 bar with three degree compression. The vapour leaving the water inter cooler at pressure 4 bar and 8 bar in a saturated state. If the load is 10 TR. Find out the power requirement to drive the three compressors and compare the c.o.p of this system with that of a simple saturation cycle working between the same overall pressure limit. 20

Section-C

6. Discuss the following : 20

- (i) Sources of heating load
- (ii) Psychrometric chart.

7. Explain the following : 20

- (i) Degree of saturation, Dew point temperature, Relative humidity.
- (ii) Basic process in conditioning of air.

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Section-D

8. (a) Give the classification of air conditioning system. 10

- (b) Discuss the cooling and dehumidifying coil. 10

9. Explain the following :

- (i) Types of compressor
- (ii) Types of expansion device. 20

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