Roll No. 725857

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B. Tech 7th Semester (ME) Examination – May, 2018

REFRIGERATION & AIR CONDITIONING

Paper : ME-403-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is ***compulsory***. Students are required to attempt ***one*** question from each Unit.

1. Write short notes on following : 20

(i) Reduced ambient type system

(ii) Steam jet refrigerating system

(iii) Partial pressure of water vapour.

(iv) Duct system design

SECTION – A

2. A Carnot refrigerator operates between the temperatures of –50°C and 50°C. Determine COP of the refrigerator. If the COP is to be made 4 by changing the temperatures such that increase or decrease in upper temperatures is equal to decrease on increase in lower temperatures, determine the new temperatures. 20

3. A bell coleman refrigeration cycle works between 1 bar and 5 bar. The adiabatic efficiency of compression is 85% and expansion is 90%,find out the COP of the system and its tonnage when the air flow rate is 1 kg/sec. The ambient temperature is 27°C and refrigerator temperature is 0°C. 20

SECTION – B

4. An ammonia refrigerator works between –6.7°C and 26°C . The Vapour is dry-saturated at the end of compression. Calculate (a) Theoretical COP (b) Power required to drive the compressor if the cooling capacity of the refrigerator is 5 tons. 20

5. Discuss the vapour compous refrigeration system with neat sketch. 20

SECTION – C

6. Prove that the Partial Pressure of water vapour in the almospheric air remains constant as long as the specific humidity remains constant. 20

7. Draw a neat diagram of air-conditioning system required in winter season. Explain the working of different components in the circuit. 20

SECTION – D

8. Compute the friction loss when 25 cm inside diameter steel pipe having an equivalent length of 100 m handles 2000 kg of water at 80°C. 20

9. Write short note on the following : 20

   (i) Winter air conditioning system

   (ii) Actuators