Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | |  | | --- | | **18ME3005** | | **Duration :** | **3hrs** |
| **Sub. Name :** | |  | | --- | | **REFRIGERATION SYSTEM DESIGN** | | **Max. Marks :** | **100** |

**ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | An ideal vapor-compression refrigerant cycle operates at steady state with refrigerant 134a as the working fluid. Saturated vapor enters the compressor at -100C, and saturated liquid leaves the condenser at 280C. The mass flow rate of refrigerant is 5 kg/min. Determine;  (i) The compressor power in kW  (ii) The refrigerating capacity in tons.  (iii) The coefficient of performance. | CO3 | 10 |
| b. | Explain cascade refrigeration system and mention its advantages. | CO2 | 06 |
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| 2. | a. | What is Kyoto protocol and has it made any difference? | CO2 | 08 |
| b. | Discuss primary and secondary refrigerant. | CO2 | 08 |
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| 3. | a. | Explain working of Li-Br vapour absorption system with neat diagram. | CO1 | 08 |
| b. | Discuss thermo-electric refrigeration system. | CO1 | 08 |
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| 4. | a. | Explain plate surface evaporator and its applications. | CO2 | 08 |
| b. | Write a short note on  i) Solenoid valves  ii) Defrost controllers | CO2 | 08 |
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| 5. |  | **Explain defrosting refrigeration piping and balancing of different components of the system.** | CO2 | 16 |
|  |  |  |  |  |
| 6. |  | Discuss micro processor based refrigeration system analysis with various refrigerants. | CO2 | 16 |
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| 7. | a. | Briefly discuss about thermostats used in refrigeration systems. | CO2 | 08 |
| b. | How does expansion device helps to control the fluctuation of load? Explain. | CO3 | 08 |
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| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. |  | The cooling capacity of brine chiller is shown in figure as a function of brine flow rate for different values of LMTD of evaporator. The brine side heat transfer coefficient increases as the brine flow rate increases as a result, the overall heat transfer coefficient of the evaporator increases.    Obtain the data for cooling capacity at various brine inlet temperatures from the characteristics of evaporator, and plot for brine inlet temperature of 100C is required, then may choose an LMTD temperature 5o C and read the capacity (Qe) for the chosen brine flow rate and also bring out brine outlet temperature from your related equation. |  |  |
|  |  | CO3 | 20 |