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

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

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| **Code :** | **17FP2017** | **Duration :** | **3hrs** |
| **Sub. Name :** | **REFRIGERATION, AIR CONDITIONING AND COLD STORAGE CONSTRUCTION** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q.**  **No.** | **Sub**  **Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain any three types of condenser with neat sketches. | CO1 | 9 |
| b. | Find the C.O.P, if the refrigerating machine is working on Carnot cycle and operates between 305 K and 260 K. | CO1 | 2 |
| c. | Represent enthalpy lines in psychrometric chart. | CO2 | 3 |
| d. | Specify the chemical properties of refrigerants. | CO1 | 6 |
| **(OR)** | | | | |
| 2. | a. | Illustrate any two types of compressor and explain their working. | CO1 | 8 |
| b. | Identify the function of absorber in an absorption refrigeration system. | CO1 | 3 |
| c. | Exemplify the working principle of capillary tube expansion valve with the help of a neat diagram. | CO1 | 7 |
| d. | Choose two important factors to be kept in mind while storing foods in cold storage. | CO5 | 2 |
|  |  |  |  |  |
| 3. | a. | Illustrate simple vapour compression refrigeration system and explain its working. | CO2 | 15 |
| b. | Describe the factors to be considered in designing air conditioning systems in ships. | CO5 | 5 |
| **(OR)** | | | | |
| 4. | a. | Illustrate practical vapour absorption refrigeration system and explain its working. | CO2 | 15 |
| b. | List the disadvantages of freeze drying. | CO3 | 5 |
|  |  |  |  |  |
| 5. | a. | Differentiate between organic and inorganic refrigerants with examples. | CO1 | 5 |
| b. | Find the mass of water drained and the capacity of cooling coil when an air conditioning plant is required to supply 60m3 of air per minute at a DBT of 21oC and 55% RH. The outside air is at DBT of 28oC and 60% RH. Assume the air conditioning plant first to dehumidify and then to cool the air. | CO2 | 15 |
| **(OR)** | | | | |
| 6. |  | Describe the different types of freezing methods. | CO3 | 20 |
|  |  |  |  |  |
| 7. | a. | Find the capacity of cooling coil in tones of refrigeration, capacity of heating coils in kW and amount of water removed per hour for the outside condition 30oC DBT and 75% RH. The inside condition is 20oC DBT and 60% RH. 20m3 of air is absorbed by the plant every minute. The required condition is to be achieved first by cooling and dehumidifying and then by heating. | CO2 | 15 |
| b. | Illustrate the central air conditioning system. | CO5 | 5 |
| **(OR)** | | | | |
| 8. | a. | Explain the Freezing curve with the pressure and temperature graph and demonstrate the importance of triple point. | CO3 | 8 |
| b. | Describe the cooling load calculation employed in design of cold storage. | CO6 | 12 |
|  |  | **Compulsory:** |  |  |
| 9. |  | Describe the important factors to be considered during logistic supply and the protocols to be followed during transportation. Explain the importance of traceability during cold chain management. | CO5 | 20 |