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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination – June – 2017**

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| **Code :** | **14FP2011** | **Duration :** | **3hrs** |
| **Sub. Name :** | **REFRIGERATION, AIRCONDITIONING AND COLD STORAGE ENGINEERING** | **Max. marks :** | **100** |

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

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. |  | Describe vapour absorption refrigeration system with a neat diagram demonstrating the flow of the process. | CO1 | 20 |
| (OR) | | | | |
| 2. |  | Use of non polluting refrigerants are inevitable. Justify with the help of various depletion potentials of refrigerants and the need for non polluting refrigerants. | CO1 | 20 |
| 3. | a. | Define Psychromterics and its applications in refrigeration systems. | CO2 | 5 |
|  | b. | List the types of expansion devices used in VCRs and write their applications. | CO1 | 5 |
|  | c. | Draw the skeleton Psychromteric Chart and explain it in detail. | CO2 | 10 |
| (OR) | | | | |
| 4. |  | Ammonia refrigerator produces 30 tones of ice from 0ºC in a day. The temperature range of the working cycle in 25ºC to -15ºC, the vapour is dry saturated at the end of compression. Assume the actual COP is 60% of theoretical; calculate the HP required to drive the compressor. The properties of Ammonia at the above conditions are   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Temp** | **Liquid** | | **Vapour** | | |  | Enthalpy kcal/kg  (hf) | Enthalpy kcal/kg K (sf) | Enthalpy kcal/kg  (hg) | Enthalpy kcal/kg K (Sg) | | 25ºC | 23.91 | 0.083 | 315.3 | 1.072 | | -15ºC | -13.04 | -0.051 | 311.9 | 1.209 | | CO2 | 20 |
| 5. | a. | Define and enlist the merits of precooling and prefreezing of foods. | CO3 | 5 |
|  | b. | Summarise the various aspects of cold storage designing and construction. Include short notes on components such as insulation, doors, and air diffusion equipment. | CO2 | 15 |
| (OR) | | | | |
| 6. |  | Discuss the salient features of transport refrigeration using refrigerated trucks and trailers. Emphasise the various types of refrigeration systems employed in the trucks. | CO2 | 20 |
| 7. |  | Elucidate the principle, construction, working and applications of the following with neat diagrams: |  |  |
|  | a. | Individual Quick Freezing. | CO2 | 10 |
|  | b. | Cryogenic Freeing. | CO2 | 10 |
| (OR) | | | | |
| 8. | a. | Describe in detail about the chilling equipment used for liquid foods. Write about the advantages those equipment. | CO2 | 15 |
|  | b. | Evaluate the applications of secondary refrigerants in food refrigeration. | CO2 | 5 |
|  | | **Compulsory**: |  |  |
| 9. |  | Explain the factors to consider, protocols, monitoring and tracability mechanisms involved in cold supply chain and logistics. | CO2 & CO3 | 20 |