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



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **14FP2011** | **Duration :** | **3hrs** |
| **Sub. Name :** | **REFRIGERATION, AIR CONDITIONING AND COLD STORAGE** | **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. | Describe in detail about desirable properties of refrigerants. | CO3 | 10 |
| b. | Write in detail about various types of condensers used in refrigeration systems. | CO3 | 10 |
| (OR) | | | | |
| 2. | a. | Illustrate with a neat sketch the working of vapor absorption cycle. | CO2 | 10 |
| b. | Describe in detail about the effect of suction pressure and super cooling. | CO1 | 10 |
| 3. | a. | Describe in details about the stages in foods freezing curve. | CO2 | 10 |
|  | b. | Illustrate with a neat sketch the working of air blast freezers. | CO2 | 5 |
|  | c. | Write a note on individual quick freezing. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | A spherical food product is being frozen in an air-blast freezer. The initial product temperature is 10°C and the cold air -40°C. The product has a 7cm diameter with density of 1000 kg/m3, the initial freezing temperature is -1.25°C, the thermal conductivity of the frozen product is 1.2 W/mK, and the latent heat of fusion is 250 kJ/kg. Compute the freezing time using plank’s method. Convective heat-transfer coefficient h= 50 W/m2 K. | CO3 | 12 |
|  | b. | Describe the mechanism behind the freezing of food materials. | CO1 | 8 |
| 5. | a. | Describe in detail about packaging of chilled foods using plastics and aluminium. | CO1 | 10 |
|  | b. | Explain in detail about construction and working of coolers for vegetables and fruits. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Explain the role of temperature monitoring in chilled food storage. | CO1 | 10 |
|  | b. | Describe in detail about the waste management in production of chilled foods. | CO2 | 10 |
| 7. | a. | Write briefly about phenolic foams application in cold storage. | CO2 | 10 |
|  | b. | Explain in detail about evaporative cooling and its applications. | CO2 | 10 |
| (OR) | | | | |
| 8. |  | Describe in detail about the chilled products transport via land, sea and air. | CO2 | 20 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Describe the Principles of RFID technologies for cold chain applications | CO3 | 10 |
|  | b. | Explain the role of Traceability in cold chain management | CO3 | 10 |

ALL THE BEST