

Roll No. ....

**24477**

**B. Tech. 7th Semester (ME)  
Examination – February, 2022**

**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 :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

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|---|---|
| 1. (a) What is COP ?  | 5 |
| (b) Define the principle of steam-jet refrigeration system. | 5 |
| (c) What is Dalton Law ?                                    | 5 |
| (d) What is humidity Sensors ?                              | 5 |

**UNIT – I**

2. What is refrigerant ? What are it's types ? Explain the desirable properties of a good refrigerant. 20

3. In a aircraft system, air enters the compressor at 0.1 MPa  $4^{\circ}\text{C}$ , and is compressed to 0.3 MPa with an entropic efficiency of 72%. After being cooled to  $55^{\circ}\text{C}$  at constant pressure in a heat exchanger. The air then expands in a turbine to 0.1 MPa with an entropic efficiency of 78%. The low temp air absorbs a cooling load of 3 tonnes of refrigerants at constant pressure before re-entering. The compressor which is driven by the turbine. Assuming air to be ideal gas, find out : 20

- (i) The C.O.P. of the refrigerator
- (ii) The driving power req.
- (iii) The air mass flow rate

#### UNIT - II

4. What is simple vapour compression refrigeration system ? Explain in detail. 20
5. Discuss the properties of aqua ammonia and electrolux refrigeration process in detail. 20

#### UNIT - III

6. Explain the following : 20
- (a) Psychrometric chart
  - (b) Basics processes in conditioning of air

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7. Explain the following : 20
- (a) Comfort chart
  - (b) Source of heating load

#### UNIT - IV

8. Discuss the design of summer air conditioning and winter air conditioning in detail. 20
9. Explain the following : 20
- (a) Types of compressors
  - (b) Type of expansion devices

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