

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, APRIL - 2026**

REFRIGERATION AND AIR CONDITIONING

[Maximum marks: 75]

[Time: 3 Hours]

PART A

I. Answer all the following questions in one word or one sentence. Each question carries 1 mark

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	One tonne of refrigeration is equal to	M1.01	R
2	The COP of a reversed Carnot cycle is most strongly depending upon	M1.02	U
3	In a refrigerating cycle, heat is absorbed by the refrigerant in a	M2.01	R
4 is highly toxic and flammable refrigerant.	M2.04	U
5	The ratio of clearance volume (v_c) to the piston displacement volume (v_p) is called	M3.01	U
6	An evaporator is used in theof a refrigeration system.	M3.03	U
7	The ratio of the sensible heat to the total heat is known as	M4.01	R
8	On a psychrometric chart, sensible cooling is represented by.....	M4.02	U
9	The sensible heat factor for auditorium or cinema hall is generally kept as	M4.04	U

PART B

II. Answer any eight questions from the following. Each question carries 3 marks.

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	Explain the difference between a heat engine, refrigerator and heat pump.	M1.01	R
2	List the advantages and disadvantages of air refrigeration.	M1.03	U
3	Compare vapour compression system and vapour absorption system.	M2.01	U
4	Explain any three methods of leak detection in refrigeration.	M2.04	U
5	Explain the working of rotary compressor with simple sketch.	M3.01	U
6	Draw the simple diagram of automatic expansion valve and mark the parts.	M3.04	U
7	List the applications of cryogenics.	M3.06	U

8	Define the terms dry air, moist air and dew point.	M4.01	U
9	List the factors affecting human comfort condition.	M4.03	U
10	Draw the simple diagram of winter air conditioning and label the parts.	M4.05	U

PART C

Answer all questions. Each question carries seven marks

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III.	Explain the reversed Carnot cycle refrigerator with help of p-v and T-s diagrams.	M1.02	U
OR			
IV.	In a refrigeration plant working on Bell Coleman cycle, air is compressed to 5 bar from 1 bar. Its initial temperature is 10 ⁰ C. After compression the air cooled up to 20 ⁰ C in a cooler before expanding back to a pressure of 1 bar. Determine the theoretical COP of the plant and net refrigeration effect. C _p =1.005kJ/kg K and C _v =0.718 kJ/kg K.	M1.04	A
V.	Explain the working vapour absorption with a simple diagram.	M2.01	U
OR			
VI.	Describe the desirable properties of ideal refrigerant.	M2.04	U
VII.	Explain the working of shell and tube condenser with a diagram.	M3.02	U
OR			
VIII.	Describe the working of thermostatic expansion valve with a neat sketch.	M3.04	U
IX.	Describe the application of refrigeration.	M3.05	U
OR			
X.	Explain the working of cascade refrigeration system with a neat sketch.	M3.06	U
XI.	Describe the psychrometric process of humidification and de-humidification.	M4.01	U
OR			
XII.	The humidity ratio of atmospheric air at 28 ⁰ C dry bulb temperature and 760 mm of mercury is 0.016kg/kg of dry air. Determine 1. Partial pressure of water vapour; 2. Relative humidity; 3. Dew point temperature; 4. Specific enthalpy; and 5. Vapour density.	M4.02	A
XIII.	Describe the factors affecting optimum effective temperature.	M4.04	U
OR			
XIV.	Describe the working of summer air conditioning system with a neat sketch.	M4.05	U
