TED (21) - 5022
(REVISION-2021)

2109230036

Reg.No……
Signature…….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER - 2023

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 'one' marks.

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1	The coefficient of performance is always …….. one.	M1.01	R
2	In air conditioning of aeroplanes, using air as a refrigerant, the cycle used is …….	M1.02	R
3	The highest temperature during the cycle, in a VCR system, occurs after ……..….	M2.01	R
4	In a vapour compression refrigeration system, the condition of refrigerant before entering the compressor is ……..….	M2.04	U
5	The ratio of compressor capacity or the suction volume (v_s) to the piston displacement volume(v_p) is called ……	M3.01	U
6	For ammonia refrigerating systems, the tubes of shell and tube condenser are made of ……	M3.02	U
7	During sensible cooling of air, the specific humidity is ……	M4.01	U
8	The curved lines on a psychrometric chart indicate ……..	M4.02	U
9	In summer air conditioning, the air is ……	M4.05	U

PART - B

II. Answer *any eight* questions from the following. Each question carries 'Three' marks.

(8 x 3 = 24 Marks)

		Module Outcome	Cognitive level
1	Describe open and closed refrigeration cycle.	M1.01	R
2	Define the terms refrigeration, refrigerating effect and tonne of refrigeration.	M1.03	U
3	Describe the effect of suction pressure and discharge pressure in vapour compression system.	M2.01	U

4	List the types of refrigerant used in vapour compression system.	M2.04	U
5	Explain the working a reciprocating compressor with simple sketch.	M3.01	U
6	Draw the simple diagram of shell and coil evaporator and mark the parts.	M3.04	U
7	Describe the liquefaction of hydrogen with simple diagram.	M3.06	U
8	Define the terms saturated air, wet bulb temperature and dew point.	M4.01	U
9	List the psychometric process.	M4.03	U
10	Draw the simple diagram of year round air conditioning system and label the parts.	M4.05	U

PART - C

Answer all the questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III.	Explain the Bell-Coleman cycle with help of p-v and T-s diagrams.	M1.02	U
	OR		
IV.	A refrigerator using Carnot cycle requires 1.25kW per tonne of refrigeration to maintain a temperature of -30ºC. **Find: 1)**COP of the Carnot refrigerator; **2)** Temperature at which heat is rejected; **3)** Heat rejected per tonne of refrigeration.	M1.04	A
V.	Explain the working of vapour compression system with a simple diagram.	M2.01	U
	OR		
VI.	Describe the primary and secondary refrigerants with example.	M2.04	U
VII.	Explain the working of shell and tube evaporator with a diagram.	M3.02	U
	OR		
VIII.	Describe the working of automatic expansion valve with a neat sketch.	M3.04	U
IX.	Describe the domestic refrigeration system.	M3.05	U
	OR		
X	List the advantages and applications of cryogenics refrigeration.	M3.06	U
XI.	Describe the psychrometric process of sensible heating and sensible cooling.	M4.01	U
	OR		
XII.	A room 7m x 4m x 4m is occupied by an air-water vapour mixture at 380C. The atmospheric pressure is 1 bar and the relative humidity is 70%. Determine the humidity ratio, dew point, mass of dry air and mass of water vapour.	M4.02	A
XIII.	Describe the classification of air-conditioning systems.	M4.04	U
	OR		
XIV.	Describe the working of winter air conditioning system with a neat sketch.	M4.05	U

****