G 1070 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2015

Seventh Semester

Branch : Automobile Engineering/Mechanical Engineering

AU 010 704 / ME 010 704—REFRIGERATION AND AIR CONDITIONING (AU, ME)

(New Scheme—2010 Admission onwards)

[Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. Define Unit of refrigeration.
2. What is Cascading ?
3. Write a note on properties of refrigerant ?
4. What is a float valve ?
5. Define human comfort.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain the working of a heat pump with a neat sketch.
7. Explain multistage vapour compression system.
8. Briefly explain thermoelectric refrigeration.
9. Explain semi-hermetic refrigeration compressor.
10. Write a note on Humidifiers.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each question carries 12 *marks.*

11. Explain Bell Coleman cycle with a neat sketch. (12 marks)

Or

Turn over

12. A Carnot refrigeration cycle absorbs heat at –12°C and rejects it at 40°C :

(a) Calculate the coefficient of performance of this refrigeration cycle.

(b) If the cycle is absorbing 15 kW at the –12°C temperature, how much power is required ?

(c) If a Carnot heat pump operates between the same temperatures as the above refrigeration cycle, what is the performance factor ?

(d) What is the rate of heat rejection at the 40°C temperature if the heat pump absorbs 15 kW at the –12°C temperature ?

(3 + 3 + 3 + 3 = 12 marks)

13. Explain a simple vapour compression system with a neat sketch. (12 marks)

Or

14. (a) Write short note on advanced vapour compression systems. (6 marks)

(b) What is a flash chamber ? What are its advantages ? (6 marks)

15. (a) Explain Cryogenic refrigeration. (6 marks)

(b) Write notes on Unit air conditioners and water coolers. (6 marks)

Or

16. (a) Write short note on ice plant. (6 marks)

(b) Write short note on cold storage. (6 marks)

17. (a) Explain the effect of inter-cooling in reciprocating compressors. (6 marks)

(b) Explain about open type refrigeration compressors. (6 marks)

Or

18. (a) Write short notes on thermostatic expansion valve. (6 marks)

(b) Write short note on reciprocating compressors. (6 marks)

19. (a) Write short notes on design of winter and summer air conditioning. (6 marks)

(b) Write short notes on design of air duct systems. (6 marks)

Or

20. Explain in detail centralised air-conditioning system. Write down the differences between unitary and central air conditioning systems.

(12 marks)

[5 × 12 = 60 marks]