(Compulsory Question)

9. Explain the following :

(a) Explain DBT.

(b) Explain WBT.

(c) Write the application of Bell-Coleman cycle.

(d) What do you mean by COP ? How is it different than efficiency ?

(e) Discuss refrigeration system and heat pump.

(f) Explain subcooling effect.

(g) Explain the requirements in the refrigerant properties in case of VCR and VAR systems.

(h) Explain the importance of h-s and T-s diagram.

(i) What is the dropwise and filmwise condensation ?

(j) Draw and indicate components of Electrolux refrigeration system. **1½×10=15**

Roll No. ..... **Total Pages : 04**

J-21-0156

B. Tech. EXAMINATION, 2021

Semester VII (CBCS)

REFRIGERATION AND AIR CONDITIONING

ME-702

Time : 2 *Hours* *Maximum Marks :* 60

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. (a) What are the necessity and methods of Refrigeration ? **7½**

(b) What is the classification of refrigeration ? Explain in detail. **7½**

2. (a) Draw and explain aircraft refrigeration system and operating cycle. **7½**

(b) Draw and explain Brayton refrigeration cycle and explain the difference between Brayton and Carnot refrigeration cycles. **7½**

Section B

3. (a) Draw and explain vapour compression refrigeration systems and operating cycle. **7½**

(b) Explain the limitations of reversed Carnot cycle with vapour as the refrigerant. **7½**

4. (a) Draw and explain in detail multistage refrigeration systems. **7½**

(b) Draw and explain the water intercooling system with multistage compression with flash intercooling. **7½**

Section C

5. (a) Draw and explain Vapour Absorption Refrigeration (VAR) systems and derive expression for the actual COP of the system. **7½**

(b) Write in detail the merits and demerits of VAR systems. **7½**

6. (a) Draw and explain steam jet refrigeration (Cascade) systems. **7½**

(b) Compare Cascade and VC systems. **7½**

Section D

7. (a) Explain Gibbs-Dalton law and importance of Psychrometry of air and air conditioning processes. **7½**

(b) Draw and explain Psychrometry chart. **7½**

8. (a) A spray cooling coil is chosen to operate under the following conditions :

Air inlet condition is 28ºC DBT and 21ºC WBT

Air outlet condition is 10ºC DBT and 6ºC WBT

Total amount of air flow is 2000 m^3/min.

The chilled water inlet and outlet temperature area 7ºC and 12ºC respectively.

Find the following :

(i) The cooling load on the coil.

(ii) Water flow rate through the coil. **7½**

(b) Classify different air conditioning systems with controls and accessories. **7½**