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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech IV Year I Semester Supplementary Examinations February-2022

REFRIGERATION & AIR CONDITIONING

(Common to AGE & ME)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Define the following terms. 6M
 i).Refrigeration ii).Heat Engine
- b Explain the working of Bell-Coleman cycle air refrigeration with P-v and T-S diagrams 6M

OR

- 2 An air refrigerator used for food storage provides 50 tons of refrigeration. The temperature of air entering the compressor is 7°C and the temperature before entering into expander is 27°C . Assuming 30 % more power is required than theoretical, find (i).Actual C.O.P of the cycle (ii).KW capacity required to run the compressor. 12M

UNIT-II

- 3 a What are the advantages of vapour compression refrigeration system over air refrigeration system? 6M
- b With a neat sketch, explain the working principle of vapour compression Refrigeration system. 6M

OR

- 4 a State the desirable properties of refrigerants. 6M
- b Name the different refrigerants generally used. 6M

UNIT-III

- 5 a Discuss properties of refrigerant and absorbent combination used in vapour absorption system 6M
- b State the advantages and limitations of VAR. 6M

OR

- 6 Comparison between two fluid VAR system and three fluid VAR system 12M

UNIT-IV

- 7 a Define Sensible heat factor. 6M
- b With help of psychrometric chart, Explain the following processes 6M
 (i).Sensible heating (ii) Sensible cooling

OR

- 8 a What do you understand by the term psychrometry? 6M
b Define the following (i).Specific humidity (ii).Absolute Humidity 6M

UNIT-V

- 9 a The main air supply duct of an air conditioning system is 800 mm X 600 mm in cross section and carries $300 \text{ m}^3 / \text{min}$ of standard air. It branches into two ducts of cross section 600 mm X 500 mm and 600 mm X 400 mm. If the mean velocity in the larger branch is 480 m / min. Find (i) Mean velocity in the main duct and the smaller branch (ii) mean velocity pressure in each duct. 6M
b Derive an expression for continuity equation in ducts. 6M

OR

- 10 a Define the term duct. Explain the needs. 6M
b Define the terms static and velocity pressure in a duct. 6M

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