Reg. No. :

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Elective

Mechanical Engineering

01UME913 - REFRIGERATION AND AIR CONDITIONING

(Regulation 2013)

(Psychrometric chart, Refrigeration table may be permitted)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. When do you go for multistage cycle?

2. Define boot strap system.

3. List the types of evaporators.

4. What are the functions of thermostat?

5. Define GSHF.

6. What is meant by Psychometric chart?

7. State the various domestic applications of refrigeration & air conditioning packages.

8. List the different types of methods for determination of duct size.

9. What type of cooling system is used in the direct system of solar cooling?

10. What are the methods for food freezing?

11. (a) Explain in detail about multistage evaporator refrigeration system with neat sketch.
(16)

Or

(b) In a cold air refrigeration working on Bell Coleman cycle, air is drawn into the cylinder of the compressor at pressure of one atmosphere and temperature of $5°C$. It is compressed to 8 atmospheric pressure and then cooled to $25°C$. If the expansion and compression follows law of $PV^{1.35}=C$, determine theoretical co efficient of performance . Take $C_p=1$ *kJ/kgK* and $C_v=0.7128$ *kJ/kgK*.
(16)

12. (a) Discuss the applications of various refrigerants in detail.
(16)

Or

(b) Describe the classifications of Evaporators according to their refrigerant flow pattern and their function.
(16)

13. (a) A small office hall of 25 persons capacity is provided with summer air conditioning system with the following data

Outside conditions=34°C DBT and 28°C WBT

Inside condition=24°DBT and 50%RH

Volume of air supplied=$0.4m^3$/*min/person*

Sensible heat load in room=125600*kJ/hr*

Latent heat load in the room=42000*kJ/hr*

Find the sensible heat factor of the plant.
(16)

Or

(b) Write short notes on (i) Air washers (ii) Year round air conditioning.
(16)

14. (a) Explain about centralized air condition system with neat sketch. List the advantages and disadvantages.
(16)

Or

(b) The following data relates to the office air conditioning plant having maximum seating capacity of 25 occupants: outside design conditions =34°C DBT, 28°C WBT; inside design conditions =24°C DBT, 50% RH; solar heat gain=9120W;Latent heat

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gain per occupant=105 W; Sensible heat gain per occupant=90W; Lightening load=2300 W; Sensible heat load from other sources = 11630 W; infiltration load = 14m^3/min; Assuming 40% fresh air and 60% of recirculated air passing through the evaporator coil and by-pass factor of 0.15, find the dew point temperature of the coil and capacity of the plant. (16)

15. (a) Explain in detail about Steam jet refrigeration with barometric condenser. (16)

<div align="center">Or</div>

(b) Explain the various freezing methods of food preservation. (16)

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