Reg. No. :

Question Paper Code: 49077

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Elective

Mechanical Engineering

14UME913 - REFRIGERATION AND AIR CONDITIONING

(Approved Refrigeration table and Steam table are allowed)

(Regulation 2014)

Duration: 1.15 hrs   Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The vapour compression refrigeration cycle operates on reversed

    (a) Rankine cycle   (b) Joules cycle   (c) Atkinson cycle   (d) Ericsson cycle

2. The super heated vapour state of refrigerant in a vapour compression cycle occurs

    (a) Before entering the expansion wall   (b) After leaving the compressor
    (c) At exist from the compressor   (d) After passing through the condenser

3.   An intercooler is used with multi stage reciprocating compressor to cool the

    (a) A refrigerant gas before it is sucked inside the compressor cylinder
    (b) Refrigerant gas before it is discharged to the receiver
    (c) Refrigerant gas after one stage of compression before it is sent to the next stage
    (d) Compressor cylinder

4. Fouling or scaling factor is the term used with

    (a) Evaporators   (b) Compressor   (c) Condenser   (d) Expansion valve

5. The wet bulb depression is zero when relative humidity equals

    (a) Zero   (b) 0.5   (c) 0.75   (d) 1

6. A sling psychometer can measure of

    (a) Absolute humidity   (b) Specific humidity

    (c) Wet bulb temperature   (d) Dry as well as wet bulb temperature

7. In winter air conditioning the air is

    (a) Heated and dehumidified   (b) Heated and humidified

    (c) Cooled and dehumidified   (d) Cooled and humidified

8. If the bypass factor of each depth in a coil is 0.8, then the combined bypass factor of a four depth coil would be

    (a) 0.4   (b) 0.62   (c) 0.8   (d) 0.95

9. Aqua ammonia solution used in vapour absorption refrigeration system is a solution of ammonia in

    (a) Water   (b) Hydrogen   (c) Lithium bromide   (d) Carbon tetra chloride

10. Which of the following machines can be used to obtain refrigeration at places where is no electric power

    (a) Air refrigeration   (b) Steam jet refrigeration

    (c) Vapour compression   (d) Vapour absorption

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11.   Sketch and explain vapour compression refrigeration cycle and draw pressure – volume and temperature – entropy diagrams.   (8)

12.   Explain with neat sketches, the construction and working of   (8)
         1) Shell and coil condenser
         2) Shell and tube condenser

13. A mixture of air and water – vapour occupies a volume of 650 m^3 at 1 bar pressure and 35^{0}c temperature. If its relative humidity is 78 percent. Calculate the specific humidity, the dew point and the masses of air and vapour in the mixture.   (8)

14. Explain with a neat line diagram sketch, the working of the following air conditioning systems: (8)

(i) Summer air- conditioning system.

(ii) Winter air- conditioning system.

15. Explain with the help of a neat sketch, the working of a vapour absorption system.

(8)