A

Reg. No. :

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. According to kinetic theory of gases, the absolute zero temperature is   CO2- App
   attained when........

   (a)Volume of gas is zero   (b)Pressure of the gas is zero

   (c) Kinetic energy of the molecules is zero   (d) Specific heat of gas is zero

2. The unit of pressure in S.I. unit is........   CO1- U

   (a) Kg/cm   (b) mm of water column   (c) Pascal   (d) Bars

3. A refrigerant with the highest critical pressure is   CO1- U

   (a) R-11   (b) R-12   (c) R-22   (d) Ammonia

4. The boiling point of carbon dioxide is   CO1- U

   (a) -20.5ºC   (b)-50ºC   (c)-73.6ºC   (d)-78.3ºC

5. The wet bulb depression is zero, when relative humidity is equal to   CO1- U

   (a) zero   (b) 0.5   (c) 0.75   (d) 1.0

6. The curved lines on a psychrometric chart indicates   CO2- App

   (a) dry bulb temperature   (b) wet bulb temperature

   (c) Specific humidity   (d) relative humidity

7. In a central air conditioning system, the duct carries   CO2- App

   (a) Water   (b)Chilled water   (c)Warm air and cold air   (d) Hot water

8. The best shape of ducts in air conditioning is   CO1- U

   (a) Round   (b) Rectangular   (c) Square   (d) Piece

9. The refrigerant, commonly used in vapour absorption system, is   CO1- U

     (a) Water   (b) ammonia   (c) freon   (d) aqua-ammonia

10 The milk is stored at a temperature of   CO2- App

     (a) 4°C   (b)-5°C   (c)10°C   (d) 12°C

<div align="center">PART – B (5 x 2= 10 Marks)</div>

11 Discuss the thermodynamic equilibrium.   CO1- U

12 Show the diagrammatic of a rotating blade-type rotary compressor.   CO2- App

13 Differentiate between humidification and dehumidification.   CO1- U

14 Discuss the purpose of the VAV in air conditioning.   CO1- U

15 How does a marine refrigeration system work?   CO2- App

<div align="center">PART – C (5 x 16= 80 Marks)</div>

16 (a) Derive an expression for the coefficient of performance for the simple air-cooling system used for aircraft and also, find the power required for the refrigeration system.   CO5- C   (16)

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

(b) Derive an expression for the coefficient of performance of heat engine, refrigerator, and heat pump and discuss their relationship.   CO5- C   (16)

17 (a) Examine the working of a single stationary blade type rotary compressor with help of neat sketches.   CO2- App   (16)

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

(b) Illustrate the working of an evaporator with help of a simple refrigeration system, P-H diagram, and also explain the bare tube coil evaporator.   CO2- App   (16)

18 (a) Draw a neat labeled diagram of a winter and summer air-conditioning system. Discuss the factors affecting the comfort air-conditioning.   CO2- App   (16)

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

(b) The amount of air supplied to an air conditioned hall is 300m³/min. The atmospheric conditions are 35°C DBT and 55% RH. The required conditions are 20ºC DBT and 60% RH. Find out the sendible heat and latent heat removed from the air per minute. Also find sensible heat factor for the system.   CO2- App   (16)

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19 (a) Examine the working of a packaged air conditioning system   CO2- App   (16)
          with help of neat sketches.

                                        Or

    (b) Air conditioning plant is required to supply $60m^3$ of air per   CO2- App   (16)
          minute at a DBT of 21ºC and 55% RH. The outside air is DBT
          of 28ºC and 60% RH. Determine the mass of water drained and
          capacity of the cooling coil. Assume the air conditioning plant
          first to dehumidify and then to cool air.

20 (a) Analyze the principle and working of the steam jet refrigeration   CO3- Ana   (16)
          system and also explain the steam ejector.

                                        Or

    (b) Illustrate with help of a neat sketch, Mechanism of the simple   CO3- Ana   (16)
          vapor absorption system.

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