



BRAINWARE UNIVERSITY

Term End Examination 2023

Programme – Dip.ME-2019

Course Name – Refrigeration & Air Conditioning

Course Code - DME605A

(Semester VI)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) In a refrigeration system, the expansion device is connected between the _____
- a) Receiver and evaporator b) Compressor and condenser
c) Condenser and receiver d) Evaporator and compressor
- (ii) In a refrigeration cycle, the flow of refrigerant is controlled by _____
- a) Compressor b) Condenser
c) Expansion valve d) Evaporator
- (iii) Identify the correct option for under cooling in a refrigeration cycle.
- a) Increases C.O.P b) Decreases C.O.P
c) C.O.P remains unaltered d) Other factors decide C.O.P
- (iv) Identify the correct value for One ton refrigeration.
- a) 50 kcal/ hr b) 50 kcal/ min
c) 100 kcal/ min d) 100 kcal/ hr
- (v) Air refrigerator works on _____.
- a) Reversed carnot cycle b) Bell-Coleman cycle
c) Carnot cycle d) Both a & b
- (vi) In vapor compression refrigeration cycle, the condition of refrigerant is high pressure saturated liquid _____.
- a) Before entering the expansion valve b) Before entering the compressor
c) Before passing through the condenser d) Before passing through the evaporator
- (vii) Presence of moisture in a refrigerant affects the working of _____.
- a) Compressor b) Condenser
c) Expansion valve d) Evaporator
- (viii) The change in evaporator temperature in a refrigeration cycle, as compared to change in condenser temperature, influences the value of C.O.P _____.
- a) More b) Less

- c) Equally
d) Unpredictable
- (ix) Identify the desirable properties of Refrigerants.
a) Low evaporator pressure
b) High condensing pressure
c) Low latent heat of vaporization
d) None of these
- (x) Identify the type of compressor is used in domestic refrigerator.
a) Centrifugal
b) Axial
c) Miniature sealed unit
d) Piston type reciprocating
- (xi) Air conditioning means _____.
a) Dehumidifying
b) Heating
c) Cooling
d) All of these
- (xii) In order to cool and dehumidify a stream of moist air, it must be passed over the coil at a temperature _____.
a) Which lies between the dry bulb and wet bulb temperatures of the incoming stream
b) Which lies between the wet bulb and dew point temperatures of the incoming stream
c) Which is lower than the dew point temperature of the incoming stream
d) Of adiabatic saturation of incoming stream
- (xiii) The bypass factor for a cooling coil is _____.
a) Increases with increase in velocity of air passing through it
b) Decreases with increase in velocity of air passing through it
c) Remains unchanged with increase in velocity of air passing through it
d) May increase or decrease with increase in velocity of air passing through it depending upon the condition of air entering
- (xiv) The dry bulb temperature lines, on the psychrometric chart are _____.
a) Horizontal and uniformly spaced
b) Vertical and uniformly spaced
c) Horizontal and non-uniformly spaced
d) Curved lines
- (xv) In a psychrometric process, the sensible heat added is 30 kJ/s and the latent heat added is 20 kJ/s. The sensible heat factor for the process will be _____.
a) 0.6
b) 0.3
c) 0.67
d) 1.5

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Define refrigeration effect. (3)
3. Describe the advantages of hermetic sealed compressor. (3)
4. State the limitations of steam jet refrigeration. (3)
5. Explain the temperature influence on COP? (3)
6. Differentiate between wet bulb temperature and thermodynamic wet bulb temperature? (3)

OR

Explain how dehumidification can be accomplished (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Explain the following psychrometric terms:- (i) Relative humidity (iii) Dew point temperature (5)
(iii) Vapour density
8. State the difference between Engine and Refrigerator. (5)
9. Explain with a neat sketch the working principle of Evaporative condenser (5)
10. The values of enthalpy at the beginning of compression, at the end of compression and at the end of condensation are 185 kJ/kg, 210 kJ/kg and 85 kJ/kg respectively. Determine the value of the COP of the vapour compression refrigeration system? (5)
11. In vapour absorption refrigeration system heating in generator is done at 177 C° , (5)
refrigeration in evaporator at -3°C and cooling in condenser at 27°C. Estimate the

maximum COP of the system.

12. In an ideal vapour compression refrigeration cycle, the enthalpy of the refrigerant before and after the evaporator are respectively 75 kJ/kg and 180 kJ/kg. Estimate the circulation rate of the refrigerant for each ton of refrigeration. (5)

OR

In an ideal vapour compression refrigeration cycle, the enthalpy of the refrigerant at exit from the condenser, compressor and evaporator is 80 kJ/kg, 200 kJ/kg and 180 kJ/kg respectively. Estimate the coefficient of performance of the cycle. (5)
