BRAINWARE UNIVERSITY

Term End Examination 2021 - 22
Programme – Diploma in Mechanical Engineering
Course Name – Refrigeration & Air Conditioning
Course Code - DME605A
(Semester VI)

Time allotted : 1 Hrs.15 Min. **Full Marks : 60**

[The figure in the margin indicates full marks.]

Group-A

(Multiple Choice Type Question) 1 x 60=60

Choose the correct alternative from the following :

(1) For obtaining high COP, the pressure range of compressor should be
a) High b) Low
c) Optimum d) Any value

(2) The boiling point of ammonia is
a) -10.5°C b) -30°C
c) -33.3°C d) none of these

(3) Cooling water is required for following equipment in ammonia absorption plant
a) Condenser b) Evaporator
c) Absorber d) Condenser, absorber and separator (rectifier)

(4) 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

(5) The vapour compression refrigerator employs the following cycle
a) Reversed Carnot b) Carnot
c) Reversed Rankine d) Rankine

(6) Thermal conductivity of water in general with rise in temperature
a) Wet bulb temperature b) Relative humidity
c) Dry bulb temperature d) Specific humidity

(7) Where does the lowest temperature occur in a vapour compression cycle?
a) Condenser b) Compressor
c) Expansion valve d) Evaporator

(8) 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

(9) In a domestic vapor compression refrigerator, the refrigerant commonly used is

a) CO_2
b) Ammonia
c) R-12
d) All of these

(10) The COP of a vapor compression plant in comparison to vapour absorption plant is

a) More
b) Less
c) Same
d) More/less depending on size of plant

(11) The vapour pressure of refrigerant should be

a) Higher than atmospheric pressure
b) Lower than atmospheric pressure
c) Equal to atmospheric pressure
d) Could be anything

(12) In a vapour compression system, the condition of refrigerant before passing through the condenser is

a) Saturated liquid
b) Wet vapor
c) Superheated vapor
d) Dry saturated vapor

(13) One ton refrigeration corresponds to

a) 50 kcal/ hr
b) 50 kcal/ min
c) 100 kcal/ min
d) 100 kcal/ hr

(14) The process, generally used in winter air-conditioning to warm and humidity the air, is called

a) Humidification
b) Cooling and dehumidification
c) Dehumidification
d) Heating and humidification

(15) In vapor compression cycle, the condition of refrigerant is saturated liquid

a) After passing through the condenser
b) Before passing through the condenser
c) After passing through the expansion throttle valve
d) Before entering the expansion valve

(16) The pressure at the inlet of a refrigerant compressor is called

a) Discharge pressure
b) Back pressure
c) Critical pressure
d) Suction pressure

(17) Air refrigerator works on…….

a) Reversed carnot cycle
b) Bell-Coleman cycle
c) Carnot cycle
d) Both a & b

(18) For summer air conditioning,the relative humidity should not be less than....

a) 0.4
b) 0.75
c) 0.6
d) 0.5

(19) 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

(20) Reducing suction pressure in refrigeration cycle

a) Lowers evaporation temperature
b) Increases power required per ton of refrigeration

c) Lowers compressor capacity because vapour is lighter
d) All of these

(21) Presence of moisture in a refrigerant affects the working of

a) Compressor
b) Condenser
c) Expansion valve
d) Evaporator

(22) The curved lines on a psychrometric chart indicates

a) Relative humidity
b) Wet bulb temperature
c) Dry bulb temperature
d) Dew point temperature

(23) When the temperature of the surrounding is higher than the temperature of the body, then the heat loss by convection from the body to the surrounding will be

a) Positive
b) Negative
c) Zero
d) None of these

(24) Ammonia is a.....

a) Non-toxic
b) Non-inflammable
c) Toxic and Non-inflammable
d) Highly toxic and inflammable

(25) Moisture in a refrigerant system is removed by

a) Driers
b) Filter-driers
c) Dessicants
d) All of these

(26) The C.O.P. of a refrigerator working on a reversed Carnot cycle is (where T_1 = Lowest absolute temperature, and T_2 = Highest absolute temperature)

a) $T_1 / (T_2 - T_1)$
b) $(T_2 - T_1)/T_1$
c) $(T_1 - T_2)/T_1$
d) $T_2/ (T_2 - T_1)$

(27) The refrigerant after condensation process is cooled below the saturation temperature before throttling. Such a process is called

a) Super-cooling
b) Normal cooling
c) Sub-cooling or under-cooling
d) None of these

(28) Critical temperature is the temperature above which

a) A gas will never liquefy
b) A gas will immediately liquefy
c) Water will evaporate
d) Water will never evaporate

(29) In vapor compression cycle, the condition of refrigerant is very wet vapor

a) After passing through the condenser
b) After passing through the expansion or throttle valve
c) Before entering the compressor
d) Before passing through the condenser

(30) Ammonia absorption refrigeration cycle requires

a) Very little work input
b) Zero work input
c) Maximum work input
d) Nearly same work input as for vapor compression cycle

(31) The sensible heat factor during the heating and humidification process is given by (where h1 = Enthalpy of air entering the heating coil, h2 = Enthalpy of air leaving the heating coil, and hA = Enthalpy of air at the end of humidification process)

a) (hA - h2)/ (h1 - h2)
b) (h2 - hA)/ (h1 - h2)
c) (h1 - h2)/ (hA - h2)
d) (hA - h1)/ (h2 - h1)

(32) The relative coefficient of performance is

a) Theoretical COP/actual COP
b) Actual COP × theoretical COP

c) Actual COP/theoretical COP
d) None of these

(33) Air conditioning means

a) Dehumidifying
b) Heating
c) Cooling
d) All of these

(34) A refrigeration cycle operates between condenser temperature of + 27°C and evaporator temperature of -23°C. The Carnot coefficient of performance of cycle will be

a) 0.2
b) 5
c) 1.2
d) 6

(35) The superheating in a refrigeration cycle

a) Does not alter C.O.P.
b) Increases C.O.P.
c) Decreases C.O.P.
d) None of these

(36) The mass of water vapor present in _____ is called absolute humidity.

a) 1 m3 of water
b) 1 m3 of dry air
c) 1 kg of wet air
d) 1 kg of dry air

(37) As relative humidity decreases, the dew point temperature will be _____ wet bulb temperature.

a) Same as
b) Higher than
c) Lower than
d) None of these

(38) 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

(39) The difference between dry bulb temperature and wet bulb temperature, is called

a) Dry bulb depression
b) Dew point depression
c) Wet bulb depression
d) Degree of saturation

(40) The coefficient of performance of Heat Pump is always _____ one.

a) Equal to
b) Less than
c) Greater than
d) None of these

(41) An evaporator is also known as

a) Freezing coil
b) Cooling coil
c) Chilling coil
d) All of these

(42) The coefficient of performance (C.O.P.) of a refrigerator working as a heat pump is given by

a) (C.O.P.)P = (C.O.P.)R + 1
b) (C.O.P)P = (C.O.P)R
c) (C.O.P)P = (C.O.P)R - 1
d) (C.O.P.)P = (C.O.P.)R + 2

(43) Vertical lines on pressure-enthalpy chart show constant

a) Pressure lines
b) Total heat lines
c) Temperature lines
d) Entropy lines

(44) Which of the following statement is wrong ?

a) The value of C.O.P. is always greater than one
b) In a vapor compression system, the condition of refrigerant before entering the compressor is dry saturated vapor
c) The space between the saturated liquid line
d) None of these

and saturated vapor line, in a pressure enthalpy chart, is wet vapor region

(45) Criticle temperature is the temperature above which

a) A gas will never liquefy
b) A gas will immediately liquefy
c) Water will evaporate
d) Water will never evaporate

(46) The central air conditioning system has_____ overall efficiency as compared to individual systems.

a) Same
b) Lower
c) Higher
d) None of these

(47) The atmospheric air at dry bulb temperature of 15°C enters a heating coil maintained at 40°C. The air leaves the heating coil at 25°C. The bypass factor of the heating coil is

a) 0.6
b) 0.367
c) 0.4
d) 0.5

(48) During heating and humidification, the final relative humidity of air

a) Is higher than that of the entering air
b) Is lower than that of the entering air
c) Can be lower or higher than that of the entering air
d) None of these

(49) Which following statement is correct?

a) The constant enthalpy lines are also constant wet bulb temperature lines
b) The wet bulb and dry bulb temperature are equal at saturation condition
c) The wet bulb temperature is a measure of enthalpy of moist air
d) All of these

(50) In a vapor compression system, the condition of refrigerant before entering the expansion or throttle valve is

a) High pressure saturated liquid
b) Wet vapor
c) Very wet vapor
d) Dry vapor

(51) Pick up the wrong statement. A refrigerant should have

a) Low specific heat of liquid
b) High latent heat of vaporization
c) High boiling point
d) Higher critical temperature

(52) The bypass factor of a cooling coil decreases with

a) Increase in fin spacing and increase in number of rows
b) Increase in fin spacing and decrease in number of rows
c) Decrease in fin spacing and decrease in number of rows
d) Decrease in fin spacing and decrease in number of rows

(53) A mixture of dry air and water vapour, when the air has diffused the maximum amount of water vapor into it, is called

a) Dry air
b) Moist air
c) Saturated air
d) Specific humidity

(54) Which of these has the maximum ozone depletion potential in the stratosphere

a) Ammonia
b) Sulpher dioxide
c) carbon dioxide
d) Fluorine

(55) The wet-bulb temperature (WBT) is the temperature read by a thermometer when

a) It is not affected by the moisture present in the air
b) Its bulb is surrounded by a wet cloth exposed to the air

c) The moisture present in it begins to condense
d) None of these

(56) The refrigerant used for absorption refrigerators working on heat from solar collectors is a mixture of water and

a) Carbon dioxide
b) Sulphur dioxide
c) Lithium bromide
d) R-12

(57) centrifugal, lobe type, screw type are _____ type compressor

a) Reciprocating
b) Rotary
c) Both a & b
d) None of these

(58) An open system is one in which.....

a) Mass does not cross boundaries of the system,through energy may do so
b) Neither mass nor energy crosses the boundsries of the system
c) Both energy and mass cross the boundaries of the system
d) Mass crosses the boundary but not the energy

(59) An closed system is one in which.....

a) Mass does not cross boundaries of the system, through energy may do so
b) Neither mass nor energy crosses the boundsries of the system
c) Both energy and mass cross the boundaries of the system
d) Mass crosses the boundary but not the energy

(60) Gases law can be fully determind by.....

a) 1st law of thermodynamics
b) 2 nd law of thermodynamics
c) 3 rd law of thermodynamics
d) 4 th law of thermodynamics