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Question Paper Code: 50782

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

ONE CREDIT COURSE

Mechanical Engineering

15UME864 - BASICS IN REFRIGERATION AND AIRCONDITIONING

(Regulation 2015)

Duration: One hour

Maximum: 50 Marks

Answer ALL Questions

PART A - (30 x 1 = 30 Marks)

- One ton refrigeration corresponds to
 - 50 kcal/ min
 - 50 kcal/ hr
 - 80 kcal/ min
 - 80 kcal/ hr
- The COP of a domestic refrigerator
 - Is less than 1
 - Is more than 1
 - Is equal to 1
 - None of these
- The coefficient of performance of a domestic refrigerator is _____ as compared to a domestic air-conditioner
 - Same
 - Less
 - More
 - None of these
- The lowest thermal diffusivity is of
 - Iron
 - Lead
 - Aluminium
 - Rubber
- A one ton refrigerating machine means that
 - One ton is the total mass of machine
 - One ton refrigerant is used
 - One ton of water can be converted into ice
 - One ton of ice when melts from and at 0° C in 24 hours, the refrigeration effect is equivalent to 210 kJ/min

6. Which of the following cycles uses air as the refrigerant?
 (a) Ericson (b) Stirling (c) Carnot (d) Bell Coleman
7. Rating of a domestic refrigerator is of the order of
 (a) 0.1 ton (b) 5 tons (c) 10 tons (d) 40 tons
8. 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
9. The relative coefficient of performance is
 (a) Actual COP/theoretical COP (b) Theoretical COP/actual COP
 (c) Actual COP \times theoretical COP (d) None of these
10. Air conditioning means
 (a) Cooling (b) Heating (c) Dehumidifying (d) All the above
11. Absorption system normally uses the following refrigerant
 (a) Freon-11 (b) Freon-22 (c) CO₂ (d) Ammonia
12. The C.O.P. of a Carnot refrigerator in winter will be _____ as compared to C.O.P. in summer.
 (a) Same (b) Lower (c) Higher (d) None of these
13. Where does the lowest temperature occur in a vapour compression cycle?
 (a) Condenser (b) Evaporator (c) Compressor (d) Expansion valve
14. An important characteristic of absorption system of refrigeration is
 (a) Noisy operation (b) Quiet operation
 (c) Cooling below 0°C (d) Very little power consumption
15. In a vapour compression system, the condition of refrigerant before passing through the condenser is
 (a) Saturated liquid (b) Wet vapour
 (c) Dry saturated vapour (d) Superheated vapour
16. The reduced ambient air cooling system has
 (a) One cooling turbine and one heat exchanger
 (b) One cooling turbine and two heat exchangers

- (c) Two cooling turbines and one heat exchanger
(d) Two cooling turbines and two heat exchangers
17. Which of the following refrigerant has the maximum ozone depletion potential in the stratosphere?
(a) Ammonia (b) Carbon dioxide (c) Sulphur dioxide (d) Fluorine
18. Condensing temperature in a refrigerator is the temperature
(a) Of cooling medium
(b) Of freezing zone
(c) Of evaporator at which refrigerant gas becomes liquid
(d) None of these
19. 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
20. In a bootstrap air evaporative cooling system, the evaporator is provided
(a) Between the combustion chamber and the first heat exchanger
(b) Between the first heat exchanger and the secondary compressor
(c) Between the secondary compressor and the second heat exchanger
(d) Between the second heat exchanger and the cooling turbine
21. In a refrigeration cycle, the flow of refrigerant is controlled by
(a) Compressor (b) Condenser
(c) Evaporator (d) Expansion valve
22. During humidification process, _____ increases.
(a) Wet bulb temperature (b) Relative humidity
(c) Dry bulb temperature (d) Specific humidity
23. 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
24. The centrifugal compressors are generally used for refrigerants that require
(a) Small displacements and low condensing pressures
(b) Large displacements and high condensing pressures
(c) Small displacements and high condensing pressures
(d) Large displacements and low condensing pressures

25. The leaks in a refrigeration system using Freon are detected by
- (a) Halide torch which on detection produces greenish flame lighting
 - (b) Sulphur sticks which on detection gives white smoke
 - (c) Using reagents
 - (d) Smelling
26. The evaporator changes the low pressure liquid refrigerant from the expansion valve into
- (a) High pressure liquid refrigerant
 - (b) Low pressure liquid and vapour refrigerant
 - (c) Low pressure vapour refrigerant
 - (d) None of these
27. Presence of moisture in a refrigerant affects the working of
- (a) Compressor
 - (b) Condenser
 - (c) Evaporator
 - (d) Expansion valve
28. A thermostatic expansion valve in a refrigeration system
- (a) Ensures the evaporator completely filled with refrigerant of the load
 - (b) Is suitable only for constant load systems
 - (c) Maintains different temperatures in evaporator in proportion to load
 - (d) None of these
29. In a refrigeration system, the expansion device is connected between the
- (a) Compressor and condenser
 - (b) Condenser and receiver
 - (c) Receiver and evaporator
 - (d) Evaporator and compressor
30. One Ton refrigeration is equivalent to
- (a) 1 kW
 - (b) 2.5 kW
 - (c) 3.5 kW
 - (d) 5Kw

PART - B (2 x 10 = 20 Marks)

31. (a) Explain in detail about history of refrigeration and air conditioning from compressor development point of view. (20)
- Or
- (b) Explain in detail about applications of refrigeration and air conditioning. (20)
32. (a) Write about working principle of thermostatic expansion valve. (20)
- Or
- (b) Write about the working principle of capillary tube (Flow control). (20)