

USN

Question Paper Version : C

Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024
Automotive Heating, Ventilation and Air Conditioning

Time: 1 hr.]

[Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

1. Preferable value of "Total equivalent warming index" in point of view of global warming is,
a) medium b) low c) high d) zero
2. Selection of refrigerant for a particular application is not based on
a) ozone depletion potential b) color depletion of tubes
c) economic of production d) global warming potential
3. The amount of heat required to convert a unit mass of liquid into a gaseous phase at constant temperature
a) latent heat of refrigerant b) latent heat of vaporization
c) latent heat of miniaturization d) None of the above
4. Antifreezer briner are used when refrigeration is required at
a) sub zero temperature b) zero temperature
c) high temperature d) None of the above
5. Typically, refrigerants undergo phase-changes during
a) condensation b) evaporation
c) evaporation and condensation d) None of the above
6. GWP stands for
a) Global wastage potential b) Global warning potential
c) Global warming potential d) Global warm potential
7. CH_3CH_3 is the chemical formula for
a) methane b) difluoroethane c) Hexa fluroethane d) Ethane
8. To conserve energy, selecting a refrigerant with large vapor specific heat will help to minimize the
a) degree of superheating b) degree of super cooling c) energy loss d) power loss

9. Which is the greenhouse gas
 a) N_2 b) O_2 c) CH_4 d) A_r
10. R-32 is a
 a) HFC refrigerant b) CFC refrigerant c) HCFC refrigerant d) Non of the above
11. In a vapour compression cycle, where do we find the lowest temperature?
 a) Expansion valve b) Condenser c) Compressor d) Evaporator
12. What is the pressure at refrigerators inlet known as?
 a) Critical pressure b) Discharge pressure c) Back pressure d) Suction pressure
13. Before entering the expansion of the throttle valve, a refrigerants condition in any vapour compression system is :
 a) moist vapour b) Dry vapour
 c) very heat vapour d) High pressure saturated liquid
14. Which of these types of compressor are used in our domestic refrigerators?
 a) centrifugal b) Miniature sealed unit
 c) Axial d) Piston type reciprocating
15. Which of the following statement is wrong?
 a) Logarithmic mean temperature difference is not equal to the arithmetic mean temperature difference
 b) The heat transfer in liquid and gases take up place according to convection
 c) The amount of heat flow through a body is dependent upon the material of the body
 d) The thermal conductivity of solid metal is increase with rise in temperature
16. During refrigeration cycle, heat is rejected by the refrigerant in a
 a) compressor b) evaporator c) condenser d) None of these
17. A refrigeration system
 a) Rejects energy to a low temperature body
 b) Removes heat from a low temperature body and delivers it to a high temperature body
 c) Removes heat from a high temperature body and delivers it to a low temperature body
 d) None of these
18. Which is not a component of vapour compression refrigeration cycle?
 a) Evaporator b) Butterfly c) Condenser d) All of these
19. The refrigerant enters the compressor at,
 a) Low temperature and high pressure b) Low temperature and low pressure
 c) High temperature and high pressure d) High temperature and low pressure
20. Factors which not effect the volume of vapour pumped by the compressor
 a) clearance volume
 b) compressor casing material
 c) pressure drop through discharge and suction valves
 d) Leakage of vapour along the piston
21. Which psychrometric property represents the maximum moisture-holding capacity of air at a specific temperature?
 a) Dry-bulb temperature b) wet-bulb temperature
 c) Relative humidity d) Dew point temperature

22. What factors affect the design of an air distribution system?
 a) Humidity and wind speed
 b) Altitude and solar radiation
 c) Room size and occupancy
 d) Geological features
23. In air conditioning what is the purpose of a ventilation system?
 a) Increase humidity levels
 b) Provide fresh air
 c) Cool the air rapidly
 d) Reduce air circulation
24. What is the most likely cause of a sudden air conditions failure?
 a) Inadequate refrigerant levels
 b) Faulty thermostat
 c) Capacitor malfunction
 d) clogged air filter
25. Inside and outside design conditions of an air conditioning system are influenced by :
 a) Seasonal changes
 b) Local flora
 c) Earth's magnetic field
 d) Ocean currents
26. What is the primary purpose of leak testing in air conditioning maintenance?
 a) Identifying refrigerant type
 b) Locating and fixing refrigerant leaks
 c) Testing electrical connections
 d) Balancing air distribution in the ducts
27. When removing and replacing components which precaution is essential to avoid system damage?
 a) Disconnecting power supply
 b) Removing the thermostat
 c) Draining all refrigerant
 d) Cleaning air filters
28. During trouble shooting, which symptom suggests a potential issue with the air conditioning compressor?
 a) uneven cooling different rooms
 b) weak airflow from vents
 c) unusual noises during operation
 d) Inconsistent thermostat reading
29. In servicing a heater system, what is a critical step to ensure optimal performance
 a) Flushing the refrigerant lines
 b) Calibrating the thermostat
 c) Inspecting and cleaning the burner assembly
 d) Adjusting the expansion valve
30. What is the primary purpose of psychometric in the context of air conditioning?
 a) Measure electrical properties
 b) Analyze psychological effects
 c) Study properties of moist air
 d) Evaluate structural strength
31. Why CFC – 12 is not used nowadays as a refrigerant?
 a) Global warming
 b) Low latent heat valve
 c) Ozone Depletion
 d) Instable
32. Which is the desirable physical property of refrigerant
 a) low boiling point
 b) Explosive
 c) Toxic
 d) High freezing point
33. Freon group refrigerant are
 a) Non toxic and non-inflammable
 b) Toxic and non inflammable
 c) Toxic and inflammable
 d) Non toxic and inflammable
34. In general the degree of refrigerants hazards depends on
 a) Amount of refrigerant used in total space
 b) Type of occupancy
 c) odor of refrigerant
 d) All of these
35. The amount of radiation mainly depends upon the
 a) type of surface of the body
 b) temperature of the body
 c) nature of the body
 d) All of these

36. The primary working fluid used for absorbing and transmitting heat in a refrigeration system
a) oil b) refrigerant c) reactant d) Lubricant
37. Refrigerants absorb heat at low temperature and ----- pressure and release heat at a higher temperature and pressure
a) medium b) high c) low d) atmospheric
38. The thermodynamic efficiency of a refrigeration system depends mainly on its,
a) operating temperature b) operating pressure
c) normal refrigerants d) Non of the above
39. Those fluids, which are used directly as refrigerants
a) Normal refrigerants b) Secondary refrigerants
c) Primary refrigerants d) None of the above
40. Secondary Refrigerants are also referred to as
a) coolant b) anti freezers c) freezer d) None of the above
41. Which is not a type of Refrigeration cycle
a) compression b) solidification c) absorption d) evaporative
42. In a refrigerating machine, heat rejected is ----- heat absorbed
a) greater than b) less than c) equal to d) None of these
43. The optimum effective temperature of human comfort is
a) lower in winter than in summer b) high in winter than in summer
c) same in winter and summer d) not dependent on season
44. For ammonia refrigerating systems, the tubes of a shell and tube condenser are made of
a) steel b) copper c) aluminium d) brass
45. The heat transfer takes place according to
a) second law of thermodynamics b) First law of thermodynamics
c) Zeroth law of thermodynamics d) None of these
46. Refrigeration capacity is measured in
a) Kg b) Centigrade c) Tons d) None of these
47. What does a vapour absorption refrigerator use in the form of a refrigerant?
a) Aqua - Ammonia b) Ammonia c) Freon d) water
48. One ton of refrigeration in the S.I unit?
a) 210kJ/unit b) 840 kJ/min c) 21kJ/unit d) 420kJ/unit
49. At a domestic refrigerators back, the bank of tubes is known as :
a) Evaporator tubes b) Capillary tubes
c) Condenser tubes d) Refrigerant cooling tubes
50. The expansion rate device, in any refrigeration system, is connected between
a) Compressor and condenser b) Compressor and Evaporator
c) Receiver and condenser d) Evaporator and receiver
