



SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY

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ROLL NUMBER

WRITTEN TEST FOR THE POST OF TECHNICIAN (MRAC) - A

DATE: 09/08/2023

TIME: 11 To 12.30 pm

DURATION: 90 MINUTES

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. Write your Roll Number on the top of the Question Booklet and in the OMR sheet.
2. Each question carries **one (1)** mark.
3. There will be no Negative Marking.
4. Each question carries 4 options i.e., **A, B, C & D**. Darken completely, the bubble corresponding to the most appropriate answer using **blue or black ball point pen**.
5. Marking more than one option will invalidate the answer.
6. Candidate should sign in the **question paper** and **OMR** sheet.
7. No clarifications will be given.
8. Candidate should hand over the **OMR** sheet and **question paper** to the invigilator before leaving the examination hall.

Signature of the Candidate

Deepa Sreedhar

Technician MRAC 9/8/2023

1. One TR of refrigeration is equal to ____ kJ/s
 - A) 3.51
 - B) 210
 - C) 12000
 - D) 10000

2. What is the full form of COP?
 - A) capacity of performance
 - B) coefficient of performance
 - C) capacity of perfection
 - D) coefficient of perfection

3. What is the full form of AHU?
 - A) Air handling unit
 - B) Air holding unit
 - C) Atmosphere handling unit
 - D) Atmosphere holding unit

4. What is the full form of CFM?
 - A) cubic Fahrenheit per metric
 - B) cubic Fahrenheit per minute
 - C) cubic feet per metric
 - D) cubic feet per minute

5. The condition of refrigerant as it leaves the compressor in a vapour compression system is
 - A) Saturated liquid
 - B) Wet vapour
 - C) Dry saturated vapour
 - D) Superheated vapour

6. A tank of 1 m³ has a holding capacity of ____ litre of water.
 - A) 1000
 - B) 100
 - C) 10
 - D) 10000

Rupa Sreedhar
9/8/2023

7. Which control opens the compressor motor circuit in the event of continuous over load?
- A) Thermostat
 - B) Fusible plug
 - C) Bi-metal strip
 - D) Spring loaded relief valve
8. What is the approximate density of water at Standard atmospheric temperature and pressure?
- A) 1000 kg/m³
 - B) 100 kg/m³
 - C) 10000 kg/m³
 - D) 200 kg/m³
9. Convert -100 (minus 100) degree Celsius to _____ Kelvin.
- A) 173.15
 - B) 150
 - C) 373.15
 - D) 0
10. Calculate the cross-sectional area of copper pipe of diameter 14 mm.
- A) 270 mm²
 - B) 154 mm²
 - C) 308 mm²
 - D) 77 mm²
11. Convert 1 atmospheric pressure to bar.
- A) 1.01325
 - B) 10.1325
 - C) 101.325
 - D) 101325

Pupa Bredha
9/8/2023

12. Which one of the following components belongs to indoor unit of split AC?
- A) Compressor
 - B) Condenser
 - C) Evaporator
 - D) Drier
13. Which fan is used in condensing unit of ductable split AC?
- A) Forward curved fan
 - B) Propeller fan
 - C) Centrifugal fan
 - D) Radial fan
14. Which one of the following components belong to outdoor unit of split AC?
- A) Blower
 - B) Air filter
 - C) Evaporator coil
 - D) Compressor
15. 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
16. Which one of the following materials is used to make ducts in Central Air-conditioning?
- A) GI sheet
 - B) Thermocole
 - C) Wood
 - D) Fibre

Rupa Sreedhar
9/8/2023

17. Rating of a domestic refrigerator is of the order of
- A) 0.1 ton
 - B) 5 tons
 - C) 10 tons
 - D) 40 tons
18. Convert 1 CFM to litre per second.
- A) 47.195
 - B) 4.7195
 - C) 0.47195
 - D) 471.95
19. Convert 1 US Gallon to litre.
- A) 3.785
 - B) 37.85
 - C) 378.5
 - D) 3785
20. Convert 98.6° Fahrenheit into $^\circ$ Celsius.
- A) 45
 - B) 54
 - C) 37
 - D) 73
21. Current is measured by which one of the instruments mentioned below?
- A) Voltmeter
 - B) Ammeter
 - C) Ohmmeter
 - D) Wattmeter
22. Voltage is measured by which one of the following instruments mentioned below?
- A) Voltmeter
 - B) Ammeter
 - C) Ohmmeter
 - D) Wattmeter

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23. Resistance is measured by which one of the instruments mentioned below?
- A) Voltmeter
 - B) Ammeter
 - C) Ohmmeter
 - D) Wattmeter
24. Energy is measured by which one of the instruments mentioned below?
- A) Voltmeter
 - B) Ammeter
 - C) Ohmmeter
 - D) Wattmeter
25. A multimeter is **NOT** able to measure which one of the following quantities mentioned below?
- A) Resistance
 - B) Voltage
 - C) Current
 - D) Capacitance
26. Where does the lowest temperature occur in a vapour compression cycle?
- A) Condenser
 - B) Evaporator
 - C) Compressor
 - D) Expansion valve
27. Convert 1 m/s to feet/minute.
- A) 196.85
 - B) 19.685
 - C) 1.9685
 - D) 1968.5
28. Convert 1 kWh to ____ kJ.
- A) 3.6
 - B) 36
 - C) 360
 - D) 3600

Deepa Sreedhar
9/8/2023

29. Domestic refrigerator working on vapour compression cycle uses which one of the following types of expansion devices?

- A) Electrically operated throttling valve
- B) Manually operated valve
- C) Thermostatic valve
- D) Capillary tube

30. The condition of refrigerant after passing through the expansion or throttle valve, in a vapour compression system is

- A) High pressure saturated liquid
- B) Wet vapour
- C) Very wet vapour
- D) Dry vapour

31. Refrigeration is based on which one of the following laws of thermodynamics?

- A) Zeroth law of thermodynamics
- B) First law of thermodynamics
- C) Second law of thermodynamics
- D) Third law of thermodynamics

32. What is the full form of ACPH?

- A) Air Change Per Hour
- B) Air Change per Hectare
- C) Atmosphere Change Per Hour
- D) Atmosphere Change per Hectare

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33. What do you understand by infiltration in HVAC?

- A) the unintentional or accidental introduction of outside air into an air-conditioned space
- B) the intentional introduction of outside air into an air-conditioned space
- C) the intentional exhaust of inside air of air-conditioned space to the outside atmosphere
- D) the unintentional exhaust of inside air of air-conditioned space to the outside atmosphere

34. The wet bulb depression is zero when relative humidity is

- A) Zero
- B) 0.5
- C) 0.75
- D) 1.0

35. What is the full form of BMS?

- A) Building Making System
- B) Building Management System
- C) Building block Manufacturing System
- D) Building Makeover System

36. What is the full form of ASHRAE?

- A) American Society of Home, Refrigerating, and Air-Conditioning Engineers
- B) American Society of Home, Renovate, and Air-Conditioning Engineers
- C) American Society of Heating, Refrigerating, and Air-Conditioning Engineers
- D) American Society of Home, Renovate, and Air-flow Engineers

Rupa Sreedhar
9/8/2023

37. What is the purpose of evacuating the AC system before gas charging?

- A) Flush oil particles
- B) Charge refrigerant
- C) Remove refrigerant
- D) Remove moisture and non-condensable gases

38. The vapour pressure of refrigerant should be

- A) Lower than atmospheric pressure
- B) Higher than atmospheric pressure
- C) Equal to atmospheric pressure
- D) Could be anything

39. 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

40. During sensible heating of air _____ decreases.

- A) Wet bulb temperature
- B) Relative humidity
- C) Dry bulb temperature
- D) Specific humidity

41. What is the coefficient of specific heat of water?

- A) 1.005 kJ/kg-K
- B) 4.18 kJ/kg-K
- C) 1005 kJ/kg-K
- D) 418 kJ/kg-K

Rekha Sreedhar
9/8/2023

42. What is the coefficient of specific heat of air?
- A) 1.005 kJ/kg-K
 - B) 4.18 kJ/kg-K
 - C) 1005 kJ/kg-K
 - D) 418 kJ/kg-K
43. What is the unit of capacitance?
- A) Volt
 - B) Ampere
 - C) Farad
 - D) Coulomb
44. Which one the of the following is **NOT** the unit of energy?
- A) kWh
 - B) Nm
 - C) J
 - D) kW
45. Diffuser is used to _____
- A) decrease the pressure and decrease the velocity
 - B) increase the pressure and increase velocity
 - C) decrease the pressure and increase the velocity
 - D) increase the pressure and decrease the velocity
46. The velocity of air is **NOT** measured by which one of the following instruments?
- A) Vane Anemometer
 - B) Hot wire Anemometer
 - C) Air Quality Monitor
 - D) Pitot tube
47. 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

Pupa Prasadhar
9/8/2023

48. In vapour 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

49. During sensible cooling of air, relative humidity _____

- A) remains same
- B) increases
- C) decreases
- D) first decreases then increase

50. Which of the following refrigerant has the maximum ozone depletion potential in the stratosphere?

- A) Ammonia
- B) Carbon dioxide
- C) Sulphur dioxide
- D) Fluorine

51. The difference between dry bulb temperature and wet bulb temperature is known as _____

- A) wet bulb depression
- B) dry bulb depression
- C) dew bulb depression
- D) humidity ratio

52. During sensible heating or sensible cooling, the specific humidity _____

- A) Remains same
- B) Decreases
- C) Increases
- D) First increases, then decrease

Purna Pradhan
9/8/2023

53. One Ton of Refrigeration (TR) is approximately _____ CFM.
- A) 200
 - B) 400
 - C) 600
 - D) 800
54. For positive differential pressure, which one of the following is correct?
- A) Positive differential pressure = Absolute Pressure - Atmosphere Pressure
 - B) Positive differential pressure = Atmosphere Pressure - Absolute Pressure
 - C) Positive differential pressure = Absolute Pressure + Gauge Pressure
 - D) Positive differential pressure = Absolute Pressure - Gauge Pressure
55. What tool is used for skimming the insulation of cables and cleaning the wire surface?
- A) Hacksaw
 - B) Firmer chisel
 - C) Electrician knife
 - D) Combination pliers
56. Relative humidity lines are represented by _____ on the psychrometric chart?
- A) Curved Lines
 - B) Straight Horizontal Lines
 - C) Straight Vertical Lines
 - D) Slanted Straight Lines
57. What set of components are used in FCU?
- A) Air filter, blower, Condenser
 - B) Compressor, Fan, Condenser
 - C) Air filter, Blower motor, Cooling coil
 - D) Cooling coil, Condenser, Fan motor

Deepa Sreedhar
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58. Wet bulb temperature lines are represented by _____ on the psychrometric chart.
- A) Curved Lines
 - B) Straight Horizontal Lines
 - C) Straight Vertical Lines
 - D) Slanted Straight Lines
59. Dew point temperature lines are represented by _____ on the psychrometric chart.
- A) Curved Lines
 - B) Straight Horizontal Lines
 - C) Slanted Straight Lines
 - D) Straight Vertical Lines
60. Condensing temperature in a refrigerator is the temperature
- A) Of cooling medium
 - B) Of freezing zone
 - C) Of evaporator
 - D) At which refrigerant gas becomes liquid
61. For saturated air which of the following relation is valid?
- A) $DBT < WBT$
 - B) $DBT > DPT$
 - C) $DPT < WBT$
 - D) $DBT = WBT = DPT$
62. Which one of the following is the human thermal comfort temperature?
- A) 16°C
 - B) 24°C
 - C) 16°F
 - D) 24°F
63. Which one of the following is the human thermal comfort relative humidity level?
- a) 20%
 - b) 50%
 - c) 75%
 - d) 100%

Rupa Sreedhar
9/8/2023

64. _____ colour wire is recommended for earth connection.
- A) Black
 - B) Red
 - C) Green
 - D) Blue
65. A fuse should be connected in _____
- A) series with the live wire
 - B) parallel with the live wire
 - C) series with the neutral wire
 - D) parallel with the neutral wire
66. A fuse operates due to the _____ effect of the electricity.
- A) Heating
 - B) Magnetic
 - C) Frequency
 - D) Electric
67. What is the full form of MCCB?
- A) Molded Case Circuit Breaker
 - B) Miniature Current Circuit Breaker
 - C) Main Current Circuit Breaker
 - D) Metal Case Circuit Breaker
68. Which winding has more inductance in refrigerator compressor motor?
- A) Run
 - B) Start
 - C) Common
 - D) Start and common
69. What is the full form of ELCB?
- A) Earth Leakage Circuit Breaker
 - B) Earth Location Circuit Breaker
 - C) Electric Location Circuit Breaker
 - D) Electric Leakage Circuit Breaker

Rupa Sreedhar
9/8/2023

70. What is the full form of RCCB?
- A) Residential Current Circuit Breaker
 - B) Residual Current Circuit Breaker
 - C) Residential Case Circuit Breaker
 - D) Residual Case Circuit Breaker
71. Which device can be used as a switch as well as a protective device?
- A) MCB
 - B) Rectifier
 - C) Isolation Transformer
 - D) Diode
72. The rating of a domestic refrigerator is of the order of _____
- A) 0.1 TR
 - B) 1 TR
 - C) 10.1 TR
 - D) 0.01 TR
73. 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) High pressure vapour refrigerant
74. The refrigerant for a refrigerator should have
- A) High sensible heat
 - B) High total heat
 - C) High latent heat
 - D) Low latent heat
75. Which type of pump is used in AC plants for circulation of chilled water?
- A) Gear
 - B) Screw
 - C) Rotary
 - D) Centrifugal

Pupa Sreedhar
9/8/2023

76. Which safety control stops the compressor motor if there is leakage of refrigerant?

- A) Lower Pressure (LP) Cut out
- B) Higher Pressure (HP) Cut out
- C) Thermostat
- D) Oil pressure cut out

77. Which secondary refrigerant is used for human comfort in Chiller plant Air-conditioning system?

- A) Brine
- B) Water
- C) Ammonia
- D) Ethylene glycol

78. Which capacity cooling tower is used in large capacity chiller plants?

- A) Forced draft
- B) Natural draft
- C) Induced draft
- D) Liquid cooling

79. Which of the following valve utilizes a disc in order to control flow?

- A) Butterfly Valve
- B) Gate Valve
- C) Globe Valve
- D) Check Valve

80. One tonne refrigerating machine means that

- A) One tonne is the total mass of machine
- B) One tonne refrigerant is used
- C) One tonne of water can be converted into ice
- D) One tonne of ice when melts from and at 0°C in 24 hours, the refrigeration effect is equivalent to 210 kJ/min

Rupe Sreedhar
9/8/2023

81. What is meant by static pressure?
- A) moving air pressure in duct
 - B) ambient air pressure outside duct
 - C) air diffusing pressure outside duct
 - D) still air pressure in duct
82. What is the application of Megger?
- A) Earth resistance testing
 - B) Insulation testing
 - C) High Tension voltage testing
 - D) High Tension current testing
83. The suction pipe diameter of refrigerating unit compressor in comparison to delivery side is
- A) Bigger
 - B) Smaller
 - C) Equal
 - D) Smaller/bigger depending on capacity
84. What is the full form of HEPA in filter?
- A) High Efficiency Particulate Air
 - B) High-Efficiency Particular Air
 - C) Highly-Effective Particulate Air
 - D) Highly-Effective Particular Air
85. Presence of moisture in refrigerant affects the working of
- A) Compressor
 - B) Condenser
 - C) Evaporator
 - D) Expansion valve
86. The formation of frost on the cooling coil in a refrigerator _____
- A) requires more energy consumption
 - B) requires less energy consumption
 - C) requires more refrigerant flow
 - D) requires less refinery refrigerant flow

Rupa Sreedhar
9/8/2023

87. Which one of the following heat exchangers is the most efficient?
- A) counter-flow heat exchanger
 - B) parallel flow heat exchanger
 - C) cross flow heat exchanger
 - D) Shell and tube heat exchanger
88. The pressure at the outlet of a refrigerant compressor is called _____
- A) static pressure
 - B) discharge pressure
 - C) saturation pressure
 - D) suction pressure
89. What is the full form of the VRV/ VRF system?
- A) volumetric refrigerant velocity / volumetric refrigerant flow
 - B) variable refrigerant volume / variable refrigerant flow
 - C) variable refrigerant velocity / variable refrigerant function
 - D) volumetric refrigeration velocity / variable refrigeration function
90. What is the function of starting capacitor in a motor?
- A) Give initial torque
 - B) Give running torque
 - C) Correct power factor
 - D) Improve energy efficiency
91. Which fire extinguisher is best suited for electrical fires?
- A) water mist fire extinguisher
 - B) wet powder fire extinguisher
 - C) water fire extinguisher
 - D) CO2 fire extinguisher
92. 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) is
- A) $T_1 / (T_2 - T_1)$
 - B) $(T_2 - T_1) / T_1$
 - C) $(T_1 - T_2) / T_1$
 - D) $T_2 / (T_2 - T_1)$

Pooja Sreedhar
9/8/2023

93. A thermostatic expansion valve in a refrigeration system
- A) Ensures that the evaporator is 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) Is used for refrigerant condensation
94. Which material absorbs the moisture in the drier?
- A) dry air
 - B) sand
 - C) PUF
 - D) Silica Gel
95. Cooling Tower is used to _____
- A) cool the space or room
 - B) cool the hot water coming from the condenser
 - C) freeze the water
 - D) increases the pressure of water
96. The refrigerant supplied to a compressor must be
- A) Superheated vapour refrigerant
 - B) Dry saturated liquid refrigerant
 - C) A mixture of liquid and vapour refrigerant
 - D) Liquid refrigerant
97. In a flooded evaporator refrigerator, an accumulator at suction side of compressor is used to
- A) Collect liquid refrigerant and prevent it from going to compressor
 - B) Detect liquid in vapour
 - C) Superheat the vapour
 - D) Collect vapours

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9/8/2023

98. The minimum temperature to which water can be cooled in a cooling tower is

- A) Dew point temperature of air
- B) Wet bulb temperature of air
- C) Dry bulb temperature of air
- D) Ambient air temperature

99. Which of the following is used for independent room cooling using a central air conditioning plant?

- A) air washer
- B) air scrubber
- C) indirect cooling unit
- D) fan coil unit

100. Moisture in Freon refrigeration system causes

- A) Ineffective refrigeration
- B) High power consumption
- C) Freezing of automatic regulating valve
- D) Corrosion of whole system

Deepa Preetan
9/8/2023

ANSWER KEY FOR TECHNICIAN MRAC 9/8/2023

Q.NO	Ans	Q.NO	Ans	Q.NO	Ans	Q.NO	Ans	Q.NO	Ans
1	a	2	b	3	a	4	d	5	d
6	a	7	c	8	a	9	a	10	b
11	a	12	c	13	b	14	d	15	c
16	a	17	a	18	c	19	a	20	c
21	b	22	a	23	c	24	d	25	d
26	b	27	a	28	d	29	d	30	a
31	c	32	a	33	a	34	d	35	b
36	c	37	d	38	b	39	d	40	b
41	b	42	a	43	c	44	d	45	d
46	c	47	a	48	a	49	b	50	d
51	a	52	a	53	b	54	a	55	c
56	a	57	c	58	d	59	b	60	d
61	d	62	b	63	b	64	c	65	a
66	a	67	a	68	a	69	a	70	b
71	a	72	a	73	c	74	c	75	d
76	a	77	b	78	c	79	a	80	d
81	d	82	b	83	a	84	a	85	d
86	a	87	a	88	b	89	b	90	a
91	d	92	a	93	a	94	d	95	b
96	a	97	a	98	b	99	d	100	c

Rupa Sreedhar
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