Multiple Choice Practice Questions/Answers for ONLINE/OMR AITT-2020

2nd Year

MECH. REF & AC.

Trade Theory

COMMERCIAL COMPRESSOR

1. The ratio of work-done per cycle to the stroke volume of the compressor is known as.....
   A. Compressor capacity
   B. Compression ratio
   C. Compressor efficiency
   D. Mean effective pressure
2. The capacity of a compression is 10 m^3/minute.10 m ^{3}/minute refers to.....
   A. Standard air
   B. Free air
   C. Compressed air
   D. Compressed air at delivery pressure
3. Aeroplanes employee following type of compressor.....
   A. Radial flow
   B. Axial flow
   C. Centrifugal
   C. Combination of above
4. The multi stage compression as compared to single stage compression.....
   A. Improves volumetric efficiency for the given pressure ratio
   B. Reduces work done per kg of air
   C. Reduces cost of compressor
   D. Gives more uniform torque
   E. All of the above
5. Compression efficiency is compared against.....
   A. Ideal compression
   B. adiabatic compression
   C. both isothermal and adiabatic compression
   D. Isothermal compression
6. The volume of air delivered by the compressor is called.....
   A. Free air delivery
   B. Compressor capacity
   C. Swept volume
   D. None of the above
7. The most efficient method of compressing air is to compress it.....
   A. Isothermal
   B. Adiabatically
   C. Isentropically
   D. Isochronically
8. Ratio of indicated HP and break HP is known as.....
   A. Mechanical efficiency
   B. Volumetric efficiency
   C. Isothermal efficiency
   C. Adiabatic efficiency
9. Maximum work is done in compressing air when the compression is.....
   A. Improves volumetric efficiency for the given pressure ratio
   B. Isothermal
   C. Adiabatic
   D. Polytropic
10. The value of air sucked by the compressor during its suction stroke is called.....
   A. Free air delivery
   B. Compressor capacity
   C. Swept volume
   D. none of the above
11. The ratio of indicated HP to shaft HP is known as.....
   A. Compressor efficiency
   B. Isothermal efficiency
   C. Volumetric efficiency
   D. Mechanical efficiency
12. Volumetric efficiency is.....
   A. The ratio of stroke volume to clearance volume
   B. The ratio of the air actually delivered to the amount of piston displacement
   C. Reciprocal of compression ratio
   D. Index of compressor performance
13. Volumetric efficiency of air compressors is of the order of.....
   A. 20 to 30%
   B. 40 to 50%
   C. 60 to 70%
   C. 70 to 90%
14. The pressure of air at the beginning of the compression stroke is.....atmospheric pressure
   A. Equal to
   B. Less than
   C. More than
   D. None of the above
15. The intercooling in multistage compressors is done.....
   A. To cool the air during compression
   B. To cool the air at delivery

C. To enable compression in two stages
D. To minimise the work of compression

16. Mining industry usually employs following motive power.....
A. AC electric motor
B. Compressed air
C. Petrol engine
D. Diesel engine

17. Ratio of compression is the ratio of.....
A. Gauge discharge pressure to the gauge intake pressure
B. Absolute discharge pressure to the absolute intake pressure
C. Stroke Volume and clearance volume
D. None of the above

18. Cylinder clearance in a compression should be.....
A. As large as possible
B. As small as possible
C. about 50% of sweet volume
C. About 100% of swept volume

19. Separators are generally installed in compressors.....
A. After the intercooler
B. Before the intercooler
C. Before the receiver
D. After the intercooler

20. Euler's equation is applicable for.....
A. Centrifugal compressor
B. Axial compressor
C. Pumps
D. All of the above

21. The parts of a screw compressor which has lobes is called --------
a: Male Rotor b. Drive Rotor
c.Driven Rotor d. Both (a) & (b)

22. The other name of a female rotor use in screw compressor is _____
a.Male Rotor b.Drive Rotor
c.Driven Rotor d. Drived Rotor

23. What is the input part of a screw compressor called _____
a. Suction b.Housing
c. Discharge d.None of these

24. The compressor oil obtained from earth in the form of minerals is called ____.
a.Mineral oil b.PAG oil
c. Ester oil d. All of these

25. Which of the following compressor oil is artificial?
a.Mineral oil b.PAG oil
c. Ester oil d. Both (b) &(c)

26. Which of the following indicates the thickness of compressor oil?
a.Viscosity b. Oiliness
c.Fire point d. Flash point

27. The pressure at the inlet of refrigerant compressor is called ___.
a. Suction pressure b. Discharge pressure c. Critical pressure d. Back pressure

28. The temperature in a multiple compressor is _____of different point.
a.Same b. Different
c.Always high d.None of these

29. The simplest capacity control for a compressor is _____.
A.On/Off control b. Hot gas by pass c.Speed modulation
d.All of these

30. The other name of Ester oil is _____.
a. Poly glycol oil b. Poly alky glycol oil
c. Polyester oil d .None of these

31.1 microfarad is equal to _____?
a. 10^{-9} Farad b.10^{-6} Farad
c. 10^{-3}Farad d.10^{6}Farad

32. Why the compressor tripped by the cut- out switch of an L.P
a. Due to polluting gas
b.Level of oil is low
c. As gas is low
d. Due to over charge

33. What is the number of gullies in a female rotor used with a 4 lobed male rotor?
a. 6 b. 8
c. 10 d. 12

34. The part of a screw compressor to which the rotor is attached called------
a. suction b. Housing
c. Discharge d. None of these
35. What is the output port of a screw compressor called?
a. suction b. Housing
c. Discharge d. None of these
36. In hermetically sealed compressor unit ------
a. Only compressor is sealed
b. Only motor is sealed
c. Either compressor on motor is sealed
d. Both compressor and motor are sealed
37. The volumetric efficiency of a compressor is --- proportional to its clearance factor?
a. Directly b. Inversely
c. Equally d. Unequally
38. The volumetric efficiency of a compressor depends upon which factor?
a. Valve pressure
b. Clearance Factor
c. Heat gain of the cylinder
d. All of these
39. The refrigerant supplied to a compressor mostly-----
a. Superheated vapour refrigerant
b. Dry saturated liquid refrigerant
c. A mixture of liquid and vapour refrigerant
d. None of these
40. Which of the following component of mechanical refrigerant system is assumed to be heart of that system?
a. Condenser b. Compressor
c. Evaporator d. Thermostat
41. The reciprocating refrigerant compressor are very suitable for---
a. Small displacement and high condensing pressure
B. Large displacement and high condensing pressure
c. Small displacement and low condensing pressure
d. Large displacement and low condensing pressure
42. What does a compressor knock means?
a. Compressore is working
b. Lubrication is happening in compressor
c. Compressore is making noise
d. All of these
43. The characteristics of a commercial compressor is----
a. it has two or more cylinders
b. its piston is made of cast iron
c. its bearing is made of bronze alloy
d. all of these
44. What is a struck up fault in a compressor?
a. When compressor make noise
b. When compressor works tightly
c. Friction in compressor
d. When compressor does not work
45. The thicker the compressor oil, its viscosity will be -----
a. lower b. Higher
c. equal d. None of these
46. The value of volumetric efficiency of a compressor ---- when its clearance factor (C) decreases?
a. decreases b. Same
c. increases d. None of these
47. The compressor in a commercial refrigeration system is used to convert a low pressure refrigerant in to which type of refrigerant?
a. low pressure b. High pressure
c. suction pressure d. Discharge pressure
48. The---- of oil can be properly controlled by the force feed lubrication?
a. distribution b. Travel
c. speed d. flow

Answer: **COMMERCIAL COMPRESSOR**

1. B
2. B
3. D
4. D
5. B
6. A
7. A
8. B
9. C
10. D
11. B
12. D
13. B
14. D
15. B
16. B
17. B
18. A
19. D
20. D
21. C
22. A
23. A
24. D
25. A
26. A
27. B
28. A
29. C
30. B
31. C
32. A
33. B
34. C
35. D
36. B
37. D
38. A
39. B
40. A
41. C
42. D
43. B
44. B
45. C
46. B
47. A

ROTARY COMPRESSORS

1 Rotary compressors are used where ____ quantities of gas are needed at relatively ____ pressure.
a) Large, high
b) large, low
c) small, high
d) small, low
2. Rotary compressor can be classified as
a) displacement compressor
b) steady-flow compressor
c) both of the mentioned
d) none of the mentioned
3. In steady-flow compressor, compression occurs by
a) transfer of kinetic energy
b) transfer of potential energy
c) trapping air
d) all of the mentioned
4. In displacement compressor, compression occurs by
a) transfer of kinetic energy
b) transfer of potential energy
c) trapping air
d) all of the mentioned
5. The rotary positive displacement machines are ____ and compression is ____
a) cooled, isothermal
b) uncooled, isothermal
c) cooled, adiabatic
d) uncooled, adiabatic
6. The Roots blower and vane-type compressor are the types of
a) displacement compressor
b) steady-flow compressor
c) both of the mentioned
d) none of the mentioned
7. For a Root blower, as pressure ratio increases, efficiency ____
a) increases
b) decreases
c) Remains constant
d) none of the mentioned
8. The vane type compressor requires ____ the Roots blower.
a) equal work input
b) more work input
c) less work input
d) none of the mentioned
9. The centrifugal and axial flow compressor are the types of
a) displacement compressor
b) steady-flow compressor
c) both of the mentioned
d) none of the mentioned
10. Which of the following is true for a centrifugal compressor?
a) rotation of impeller compresses the air
b) diffuser converts part of KE into internal energy
c) typical pressure ratio is around 1.4 to 1
d) all of the mentioned
11. Which of the following is true for an axial-flow compressor?
a) blades are arranged in same manner as in reaction turbine
b) flow of air is along the axis of compressor
c) velocity of air changes when it passes through the blades
d) all of the mentioned
12. For uncooled rotary compressor, compression process is ____ while ideal process is ____
a) isothermal, adiabatic
b) isentropic, adiabatic
c) adiabatic, isentropic
d) adiabatic, isothermal
13. In an adiabatic irreversible process, extra work is done to overcome friction.
a) True
b) false

14. What is the name of the valve used as suction valve rotary compressor?
    a) Ball valve
    b) Hand valve
    c) Angle valve
    d) Check valve
15. Which parts belongs to Rotary compressor?
    a) Dividing blade
    b) Piston
    c) Connecting rod
    d) None of these
16. Rotary compressor compresses the gas in --
    a) Reciprocating motion
    b) Rotary motion
    c) Centrifugal motion
    d) None of these
17. The maximum capacity of Rotary compressor
    a) One ton
    b) Two ton
    c) Three ton
    d) Four ton
18. Rotary compressor is used in now a days?
    a) Domestic Refrigeraters
    b) Air conditioner split A/C
    c) Deep freezer
    d) Water cooler
19. Rotary compressor operate at
    a) 220 volt AC supply
    b) 440 volt AC supply
    c) Both (a) and (b)
    d) None of these
20. In a rotary compressor, the roller is fitted above which of the following components?
    a) Spring
    b) Blade
    c) Eccentric
    d) None of these
21. In which of the following compressor is the roller attached to a blade?
    a) Single stationary blade rotary compressor
    b) Rotating blade rotary compressor
    c) Reciprocating compressor
    d) None of these
22. In which of the following compressors, the roller is attached to four blades?
    a) Rotating blade rotary compressor
    b) Single stationary blade rotary compressor
    c) Reciprocating compressor
    d) None of these
23. The main parts of rotary compressor are
    a) Cylinder and rotor
    b) Blade and crank shaft
    c) Valve and crank shaft soal
    d) All of these
24. What is the physical condition of refrigerant in hermetri dome of rotary compressor?
    a) LP liquid
    b) HP liquid
    c) LP vapour
    d) HP vapour

ANSWER: **ROTARY COMPRESSORS**

1. B	6. A	11. D	16. B	21. A
2. C	7. B	12. C	17. D	22. A
3. A	8. C	13. A	18. B	23. A
4. C	9. B	14. D	19. A	24. D
5. D	10. D	15. A	20. C	

WATER COOLED CONDENSER

1. Based on the external fluid/cooling medium, condensers can be divided into three parts. Which one of the following is not one of them?
   a) Air cooled condensers
   b) Water cooled condensers
   c) Evaporative condensers
   d) Sub-cooled liquid condensers

2. In natural convection type, heat transfer from the condenser is by buoyancy induced natural convection and radiation.
   a) True
   b) False

3. The fin spacing is usually preferred to be _____ to minimize the fouling effect by dust and to allow free flow of air with little resistance.
   a) Large
   b) Small
   c) Very small
   d) Joint

4. The surface area of natural convection type condensers is _____ the forced convection ones for same capacity.
   a) Less than
   b) More than
   c) Equal to
   d) Very much less than

5. In traditional Refrigerators in home appliances, what is the type of condenser used?
   a) Natural convection type
   b) Forced convection type
   c) Furnace Type
   d) Rotary condensers

6. In traditional Air conditioners in home appliances, what is the type of condenser used?
   a) Natural convection type
   b) Forced convection type
   c) Flash Type
   d) Rotary condensers

7. Which type of fins are the most commonly used fin type in condensers?
   a) Annular fin
   b) Plate type fins
   c) Tube fin
   d) Extended double pipe

8. Water cooled condensers can be classified to three more categories, which one of the following is incorrect?
   a) Double pipe
   b) Plate type
   c) Shell-and-tube type
   d) Shell-and-coil type

9. In the double pipe setup of the condenser, the refrigerant flows in the _____
   a) Shell
   b) Annulus
   c) Inner Tube
   d) Jacket

10. Shell and coil type condensers have a capacity at around _____
    a) 10 TR
    b) 20 TR
    c) 30 TR
    d) 50 TR

11. Double pipe water cooling condensers have a capacity at around _____
    a) 10 TR
    b) 20 TR
    c) 30 TR
    d) 50 TR

12. In the double pipe setup of the water-type condenser, the cold water flows in the _____
    a) Shell
    b) Annulus c) Inner Tube d) Jacket

13. The function of a condenser in a thermal power plant is.....
    A. To act as reservoir to receive steam for turbine
    B. To condense steam into condensate to be reused again
    C. To create vacuum

D. All of the above

14. The commonly used material of pipes in condensers is.....
A. Mild steel
B. Stainless steel
C. Cast iron
D. Admiralty brass

15. A condenser where circulating water flows through tubes which are surrounded by steam, is known as.....
A. Surface condenser
B. Jet condenser
C. Barometric condenser
C. Evaporative condenser

16. The vacuum obtainable in a condenser is dependent upon.....
A. Capacity of ejector
B. Quantity of steam to be handled
C. Any of above two is possible
D. Temperature of cooling water

17. The ratio of actual vacuum to the ideal vacuum in a condenser is called.....
A. Condenser efficiency
B. Vacuum efficiency
C. Boiler efficiency
D. Nozzle efficiency

B. Reduces back pressure of steam
C. Reduces temperature of exhaust steam
D. All of the above

18. A condenser in a steam power plant is.....
A. Increases expansion ratio of steam
B. Reduces back pressure of steam
C. Reduces temperature of exhaust steam
D. All of the above

19. The temperature of condensate is.....on leaving the condenser than that of circulating water at inlet
A. Higher
B. Lower
C. Same

20. The vacuum obtainable in a condenser is dependent upon.....
A. Capacity of ejector
B. Quantity of steam to be handled
C. Any of the two is possible

21. The actual vacuum in a condenser is equal to.....
A. Barometric pressure + actual pressure
B. Barometric pressure - actual pressure
C. Gauge pressure + atmospheric pressure
D. Gauge pressure - atmospheric pressure

22. How the condenser capacity is expressed?
A.kcal/kg
B. kcal/hr
C.kg/kcal
D. kcal/kgc

23. Which type heat removal change the refrigerant vapour to liquid in water cooled condenser
A. super heat from vapour
B. heat to sub cool the liquid
C. latent heat of condensation
D.sensible heat to desuper heat the vapour

24. Which type of water is having calcium carbonate cotent more than 180 ppm ?
A. soft
B. hard
C. medium
D.very hard

25. Calculate the water flow required for 5TR, if one TR water cooled condenser handles 9 Lts/min and temperature difference remains the same?
A. 35 Lts/hr
B. 40 Lts/hr
C. 45 Lts/hr
D. 50 Lts/hr

26. Which process is used to remove the hard type of salt deposit from water tubes in shell and tube type condenser?
A.descaling
B. flushing
C. scaling
D. purging

27. Which condenser combines the functions of water cooled condenser and cooling tower?
A. forced condenser
B. natural condenser
C. water cooled condenser
D. exaporative condenser

28. Which material is used as a sealant to prevent water leakage in shell and tube type condenser?
A.washer
B. gasket
C. saddle
D. tube sheet

29. Which is used to support the tubes and directs the gas flow in a shell and tube condenser?
A. tube nest
B. baffle plates
C. mouting saddle
D. corrugated end cover

30. What is the purpose of vent connection in shell and tube condenser?
A. isolate water flow
B. allow water to flow
C. Release excess gas pressure
D. purging non condensable gas

31. What is the reason for capacity reduction in water cooled condenser?
A. more water outlet Temp.
B. less water inlet Temp.
C. increased water flow
D. reduced water flow

32. What is the reason for scale formation in water cooled condenser tubes?
A. aigal in the water
B. flowing in the condenser
C. condenser pressure is low
D. dessloved chemical and salt in the water

33. What is the preventive step taken to reduce flowing in condenser water tubes?
A. water treatment
B. replace condenser
C. decrease water flow
D. replace cooling tower

34. What is the effect on water tubes of condenser if the PH value of water becomes three (3) ?
A. flowing
B. scaling
C. corrosion
D. descaling

35. How to prevent the leakage of tube inside the shell and tube condenser?
A. plug it with cork
B. fix the rubber plug
C. solder the leaky spot
D. fix taper brass plug type

36. What is the effect of providing couter flow of water and refrigent in shell and tube condenser?
A. improve life of condenser
B. reduce load of on water pump
C. decrease the flow of gas
D. increase heat transfer efficiency

37. Why the water tubes are framed with fresh water after chemical descaling in water cooled condenser?
A. drain out
B. remove and traces
C. push out carbon particles
D. pluge out refrigerant

38. Which of the following condenser does not use a fan?
A. air cooled condenser
B. water cooled condenser
C. evaporative condenser
D. all of these

39. The efficiency of watercooled condenser is---
A. lower than the air cooled condenser
B. same as that of air cooled condenser
C. higher than the air cooled condenser
D. none of these

40. In shell and tube condenser----
A. water flows in the shell and refrigerant flows in the tubes
B. water flows in the tubes and refrigerant flows in the shell
C. both (A) and (B)
D. none of these

41. The liquid used for scaling of condenser in the refrigeration system is ----
A. water
B. base
C. acid
D. baking soda with water

Answer: **WATER COOLED CONDENSER**

1.D, 2.A , 3.A, 4.B , 5.A , 6.B, 7.B, 8. B, 9. B , 10. D

11. A , 12. C , 13.D, 14.D , 15.A , 16.D, 17. B , 18. D

19. A , 20.D, 21. B , 22. B, 23.C , 24.D , 25. C ,26.A

27.D , 28. B , 29.B , 30. D ,31. D , 32. D ,33. A , 34.C

35. D , 36.D ,37. B ,38. B ,39.C, 40. B , 41. B

COOLING TOWER

1. Open cooling system is also called as _____
   a) parallel system
   b) once through system
   c) air-based system
   d) non-reversible system

2. How many numbers of spray nozzle does each module on spray pond cooling system contains?
   a) 1
   b) 2
   c) 3
   d) 4

3. Which of the following is the simplest method of cooling the condenser water?
   a) Spray cooling pond
   b) Cooling tower
   c) Indirect air cooling
   d) Hyperbolic cooling tower

4. In which type of cooling pond system are nozzles arranged on same elevation?
   a) Single deck system
   b) Double deck system
   c) Natural Flow system
   d) Direct flow system

5. In which type of cooling system are nozzles arranged on different elevation?
   a) Single deck system
   b) Double deck system
   c) Natural Flow system
   d) Direct flow system

6. What are used in the direct flow system to transverse the pond before uniting at intake?
   a) Separators
   b) Filters
   c) Baffle walls
   d) Porous pipes

7. Select the disadvantage of cooling pond out of the given?
   a) The area required of cooling in a cooling pond is small
   b) Spray losses due to evaporation and windage run high
   c) There is no control over the temperature of cooled water
   d) The cooling efficiency is low compared with cooling water

8. What type of cooling system is used in the large power plants?
   a) Cooling ponds
   b) Natural flow system
   c) Cooling towers
   d) Single deck system

9. How does outside air enter into the wet cooling system?
   a) Air vents
   b) Louvers
   c) Tuyeres
   d) Vacuum

10. How is water circulated throughout the dry cooling tower system?
    a) Finned tubes
    b) Metal pipes
    c) Porous tubes
    d) Swirling tubes

11. Why is exhaust steam coming out of turbine is admitted to a steam header?
    a) To increase the pressure
    b) To decrease the velocity
    c) To decrease the pressure drop
    d) To control the pollution

12. In which system is Cooling of hot water is done on tray as step by?
    a) Mechanical draught cooling system
    b) Hyperbolic cooling tower
    c) Atmospheric cooling tower
    d) Wet cooling tower

13. How does the flow of air occur in natural draught cooling towers?
    a) Natural pressure head density between cold outside air and humid inside air
    b) Variation in pressure of both cold outside air and humid inside air
    c) Due to the given air vents and vacuum ports
    d) Because of difference in the volume of both the of airs

14. How is air produced in mechanical draught cooling tower?
    a) Air Tuyeres
    b) Propeller fans
    c) Air blowers
    d) Louvre

15. Why is induced draught considered better than the forced draught?
    a) Because power requirement is high

for forced draught
b) Maintenance of induced draught fan is costlier
c) Forced draught is less efficient
d) Forced draught produces less amount of speed of air

Answers: COOLING TOWER

1:	B	6:	c	11:	c
2:	D	7:	c	12:	c
3:	A	8:	c	13:	a
4:	A	9:	b	14:	b
5:	B	10:	a	15:	a

WATER TREATMENT

1. Both temporary and permanent hardness of water can be removed by
    a) boiling
    b) distillation
    c) filtration
    d) decantation
2. Coliform bacteria in water is an indication of the presence of
    a) radioactive wastes
    b) excess fertilizer
    c) decaying animals and plants
    d) human feces
3. The activated sludge process is sometime referred as
    a. fluid bed biological oxidation system
    b. fixed bed biological oxidation system
    c. turning bed biological oxidation system
    d. none of the above
4. BOD stands for
    a) biochemical oxygen demand
    b) british oxygen demand
    c) british oxygen depletion
    d) biological oxygen depletion
5. When temporary hard water is boiled, one of the substances formed is
    a) calcium bicarbonate
    b) calcium sulphate
    c) hydrogen chloride
    d) carbon dioxide
6. Zeolite softening process removes both temporary and permanent hardness of water. In this process the calcium and magnesium present in water are precipitated as
    a) insoluble carbonates
    b) insoluble zeolites
    c) insoluble chlorides
    d) insoluble sulphate's
7. The methods used for biological treatment are
    a) lagoon
    b) activated sludge process
    c) oxidation ditches
    d) all of these
8. From the following sanitizers which one comes under category of surface active agents?
    a) Tetra phosphate
    b) Teepol
    c) Meta phosphate
    d) None of these
9. The purest form of naturally occurring water is
    a) rain water
    b) river water
    c) pond water
    d) well water
10. Calgon is used for removal of
    a) sodium carbonate
    b) permanent hardness of water
    c) potassium carbonate
    d) none of these
11. The water being used in dairy industry should contain not more than
    a) 5 proteolytic and/or lipolytic organisms per ml
    b) 10 proteolytic and/or lipolytic organisms per ml
    c) 15 proteolytic and/or lipolytic organisms per ml
    d) 20 proteolytic and/or lipolytic organisms/ml
12. The activated sludge process consists of returning a portion of the clarifier
    a) effluent water entering the reactor
    b) influent water coming out of the reactor
    c) influent water entering the reactor
    d) effluent water coming out of the reactor
13. Permanent hardness of water may be removed by the addition of
    a) lime
    b) soda ash
    c) potassium permanganate
    d) sodium bicarbonate
14. Both temporary and permanent hardness of water can be removed on boiling water with
    a) calcium hydroxide
    b) sodium carbonate
    c) calcium oxide
    d) calcium carbonate

15. Lagoons may be characterized as
    a) anaerobic
    b) facultative
    c) aerated
    d) all of these

16. Temporary hardness of water may be removed by adding
    a) calcium hydroxide
    b) calcium carbonate
    c) calcium chloride
    d) sodium bicarbonate

17. The maximum desirable limit (BIS of mercury in the drinking water is
    a) 0.05 mg/l
    b) 0.9 mg/l
    c) 0.1 mg/l
    d) 0.001 mg/l

18. Which of the following substances are commonly used in a filter?
    a) Charcoal
    b) Sand
    c) Both (1) and (2)
    d) Aluminium chloride

19. Biological oxidation processes usually referred as biological treatment, are the most common form of
    a) primary treatment
    b) secondary treatment
    c) tertiary treatment
    d) all of these

20. The maximum permissible limit (BIS) of turbidity in drinking water is
    a) 5 NTU
    b) 10 NTU
    c) 15 NTU
    d) 20 NTU

21. Sedimentation is a physical process used in wastewater treatment to
    a) remove particles that are less dense than water
    b) remove particles that are more dense than water
    c) remove the pertinacious material from the water
    d) none of the above

22. The ultimate source of water is
    a) rivers and lakes
    b) dew and forest
    c) rain and snow
    d) underground and surface

23. Which of the following physical method is used as germicidal in modern time for the treatment of drinking water?
    a) Chlorination
    b) Treating with potassium permanganate
    c) UV radiation
    d) Treating with bleaching powder

24. Sanitizer used specifically for vitreous enamel are
    a) strong alkalis
    b) strong acids
    c) weak alkali with sodium silicate
    d) none of these

25. The common methods used for disinfection in waste water treatment plants are
    a) chlorination
    b) UV light
    c) both (a) and (b)
    d) Phenolic solvent

26. Inhibitors are used along with sanitizer to
    a) improve their action
    b) to prevent corrosion
    c) both (a) and (b)
    d) none of these

27. Sanitizers used for rubber made equipments are
    a) strong acids
    b) strong alkalis
    c) combination of both
    d) none of these

28. Application of quaternary ammonium compounds as sanitizing agents tends to
    a) favour gram positive bacteria
    b) decrease gram positive bacteria
    c) increase the percentage of gram (-)ve rods on utensils
    d) none of the above

29. Permanent hardness of water is caused by the presence of
    a) bicarbonates of calcium and magnesium
    b) carbonates of sodium and potassium
    c) chlorides and sulphates of calcium and magnesium
    d) phosphates of sodium and potassium

30. According to BIS the maximum permissible limit of dissolved solids in drinking water is
    a) 1000 mg/l
    b) 500 mg/l
    c) 2000 mg/l
    d) 2000 mg/l

31. Acid used mostly for removal of milk stone is
    a) phosphoric acid
    b) nitric acid
    c) gluconic acid
    d) tartaric acid
32. Which of the following chemical is sometime added in the process of coagulation and flocculation?
    a) Aluminium sulphate
    b) Aluminium oxide'
    c) Calcium chloride
    d) None of these
33. Hardness of water does not
    a) have any bad effect in boiler
    b) make cooking of foods difficult
    c) make it unfit for drinking
    d) cause difficulty in the washing of clothes with soaps
34. Permanent hard water may be softened by passing it through
    a) sodium silicate
    b) sodium bicarbonate
    c) sodium hexametaphosphate
    d) sodium phosphate
35. Zeolite used in zeolite softening process for the treatment of hard water gets exhausted after certain time of usage but can be regenerated by flushing it with
    a) 10% calcium chloride solution
    b) 10% magnesium sulphate solution
    c) 10% magnesium chloride solution
    d) 10% sodium chloride solution
36. Temporary hardness of water is caused by the presence of
    a) chlorides of calcium and magnesium
    b) sulphates of calcium and magnesium
    c) bicarbonates of calcium and magnesium
    d) carbonates of sodium and potassium
37. Secondary treatment uses _____ to consume wastes
    a) micro-organisms
    b) chemicals
    c) filtration
    d) none of these
38. The maximum desirable limit Bureau of Indian Standards (BIS) of lead in the drinking water is
    a) 0.05 mg/l
    b) 0.09 mg/l
    c) 0.1 mg/l
    d) 1.0 mg/l
39. Zeolite softening process removes
    a) only temporary hardness of water
    b) only permanent hardness of water
    c) both temporary and permanent hardness of water'
    d) the dissolved gases in permanent hard water
40. Conventional tertiary treatment is
    a) chemical coagulation and flocculation
    b) filtration
    c) sedimentation
    d) none of these
41. The maximum desirable limit (BIS) of total hardness (as $CaCo_3$) in drinking water is
    a) 600 ppm
    b) 300 ppm
    c) 500 ppm
    d) 1000 ppm
42. The chemical oxygen demand (COD)measures the
    a) amount of oxygen required for growth of microorganisms in water
    b) amount of oxygen that would be removed from the water in order to oxidize pollution
    c) amount of oxygen required to oxidize the calcium present in waste water
    d) none of the above

Answers: **WATER TREATMENT**

1:	B	15:	d	29:	c
2:	D	16:	a	30:	c
3:	A	17:	d	31:	b
4:	A	18:	c	32:	a
5:	D	19:	b	33:	c
6:	B	20:	b	34:	c
7:	D	21:	b	35:	d
8:	B	22:	c	36:	c
9:	A	23:	c	37:	a
10:	B	24:	c	38:	a
11:	A	25:	c	39:	c
12:	C	26:	b	40:	a
13:	B	27:	b	41:	b
14:	B	28:	c	42:	b

EXPANSION VALVE

1. In vapour compression refrigeration cycle, the condition of refrigerant is saturated liquid.....
    a) Before entering the expansion valve
    b) Before entering the compressor
    c) After passing through the condenser
    d) Before passing through the condenser
2. In vapour compression refrigeration cycle, the condition of refrigerant is very wet vapour.....
    a) Before entering the expansion valve
    b) Before entering the compressor
    c) After passing through the condenser
    d) After passing through the expansion or throttle valve
3. In vapour compression refrigeration cycle,the condition of refrigerant is high pressure saturated liquid ....
    a) Before entering the expansion valve
    b) Before entering the compressor
    c) After passing through the condenser
    d) Before passing through the condenser
4. In vapour compression refrigeration cycle, the condition of refrigerant is superheated vapour.....
    a) Before entering the expansion valve
    b) Before entering the compressor
    c) After passing through the condenser
    d) Before passing through the condenser
5. In vapour compression refrigeration cycle, the condition of refrigerant is dry saturated vapour.....
    a) Before entering the expansion valve
    b) Before entering the compressor
    c) After passing through the condenser
    d) Before passing through the condenser

6. What is the name of automatic expansion valve based on its function?
    a) Thermostatic valve
    b) High side float valve
    c) Low side float valve
    d) Constant pressure valve
7. How many types of float valves are used as expansion device in refrigeration?
    a) One
    b) Two
    c) Three
    d) Four
8. Which expansion valves orifice is adjusted by super heat?
    a) Automatic expansion valve
    b) Electronic expansion valve
    c) High side float valve
    d) Low side float valve
9. Which type of expansion valve is used in flooded type chiller?
    a) Constant pressure valve
    b) Themostatic valve
    c) Capillary tube
    d) Float valve
10. What is the purpose of using expansion device in vapour compression cycle?
    a) Reduce refrigerant pressure
    b) Increase refrigerant pressure
    c) Increase the fluid temperature
    d) Decrease the vapour temperature
11. Which pressure opposes the spring pressure in AEV?
    a) Condenser
    b) Evaporator
    c) Bellow
    d) Meddle

12. Which sealing materials prevents the refrigerant leakage in TEV body?
    a) Gasket
    b) ‘O’ ring
    c) Bush
    d) Bearing
13. Which part is used to hold the spring in position in TEV?
    a) Retainer
    b) Body plug
    c) Adjustment
    d) Super heat spring
14. What is the advantage of setting constant super heat sensing in TEV?
    a) Increasing decreasing pressure
    b) Foods refrigerant as per load
    c) Pressure adjustment
    d) Valve adjustment
15. Which fluid operate the low side float valve in chamber?
    a) Secondary refrigerant
    b) Liquid refrigerant
    c) Refrigerant vapour
    d) Refrigeration oil
16. Which expansion valve is used with NTC type thermostat sensor?
    a) Thermal electronic expansion valve
    b) Thermostatic expansion valve
    c) Electronic expansion valve
    d) Automatic expansion valve
17. Which line the refrigerant is fitted in vapour compression cycle?
    a) Liquid line
    b) Vapour line
    c) Suction line
    d) Discharge line
18. What is the effect of exceeding the spring pressure by the evaporator pressure in AEV?
    a) Valve moves towards closing
    b) Valve moves towards opening
    c) Half a way the valve is opened
    d) Valve is fully opened
19. What is the effect if the evaporator pressure immediately reduced below the spring pressure In AEV?
    a) Feeds more liquid to evaporator
    b) Feeds less liquid to evaporator
    c) Allows only vapour
    d) Allows no liquid
20. What is the position of float ball in high side if condensation increase in refrigeration system ?
    a) Moves upwards
    b) Moves downwards
    c) Valve fully closed
    d) Valve fully opened
21. The device used to reduce the pressure of refrigerant in the refrigeration system is
    a) Capillary tube
    b) Drier
    c) Expansion valve
    d) Both (a) and (b)
22. which of the following device is also known as throttling device ?
    a) capillary tube
    b) drier
    c) reciver
    d) none if these

23. The expansion device used with flooded evaporator is----
    a) Capillary tube
    b) Float valve
    c) Expansion valve
    d) All of these
24. The expansion device with small internal diameter out of the following is ---
    a) Capillary tube
    b) Drier
    c) Expansion valve
    d) Both (a) and (c)
25. Capillary tube is used in the form of expansion valve
    a) In domestic refrigerators
    b) In AC
    c) In water cooler
    d) All of these
26. Major thermostatic expansion valves are set for how much superheat temperature?
    a) 5 º C
    b) 10 º C
    c) 15 º C
    d) 20 º C
27. which tool is used for cutting capillary tube ?
    a) Chisel and hammer
    b) Brazing or cutting torch
    c) Knife and file
    d) Hacksaw
28. During expansion in capillary tube enthalpy
    a) Increase
    b) Decrease
    c) No change
    d) None of these
29. Which expansion valve operation is controlled by microprocessor?
    a) Thermal electronic expansion valve
    b) Thermostatic expansion valve
    c) Automatic expansion valve
    d) Electronic expansion valve

ANSWER:- **EXPANSION VALVE**

1.c	6.d	11.b	16.c	21.d	26.a
2.d	7.b	12.a	17.a	22.a	27.c
3.a	8.b	13.a	18.a	23.b	28.c
4.d	9.d	14.b	19.a	24.a	29.d
5.b	10.a	15.b	20.a	25.d	

EVAPORATOR

1.Which one of the following is not a type of evaporator?
a)Forced Circulation
b) Natural Circulation
c) Nucleate Boiling
d) Gasketed evaporators

2. Refrigerators use liquid coolants which evaporate in an evaporator installed in a closed chamber.
a) True
b) False

3. Which one of the following is not a suitable application of evaporators?
a) Refrigeration
b) Cooling
c) Heating
d) Crystallisation

4. What is the driving force for evaporation to take place?
a) Difference in partial pressure
b) Difference in pressure
c) Difference in Concentration
d) Difference in temperature

5. Crystallizers are one of the most important setups in industries nowadays. It is solely used to dry a solution to an extent to obtain the crystals of the solute. Which one of the following is the most suitable operation to carry out this process?
a) Forced Circulation
b) Natural Circulation
c) Nucleate Boiling
d) Non-nucleate Boiling

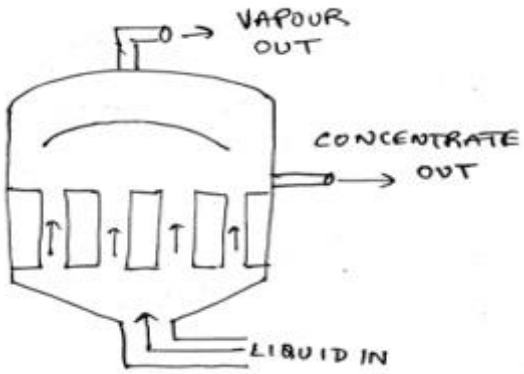
6. Why don't we use Natural convection for evaporating waste streams, crystallizers, and viscous fluids?
a) Slow process
b) Sedimentation problem
c) Prevents fouling at the heating surface
d) Causes overheating

7. Falling film evaporators are those in which evaporation takes place from the film interface with nucleate boiling at the wall.
a) True
b) False

8. How are the tube surfaces in falling film evaporators heated to enhance evaporation?
a) Heaters at about 200℃
b) Heaters at above 200℃
c) Heaters at just above 100℃
d) Steam condensing at the outer wall

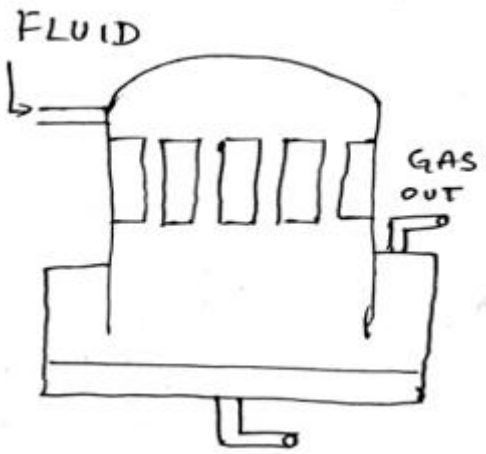
9. Which one of the following is not a subset of nucleate boiling evaporators?
a) Climbing Film Evaporator
b) Rising Film Evaporator
c) Short-tube Vertical Evaporator
d) Falling Film Evaporator

10. Recognize the following evaporator.



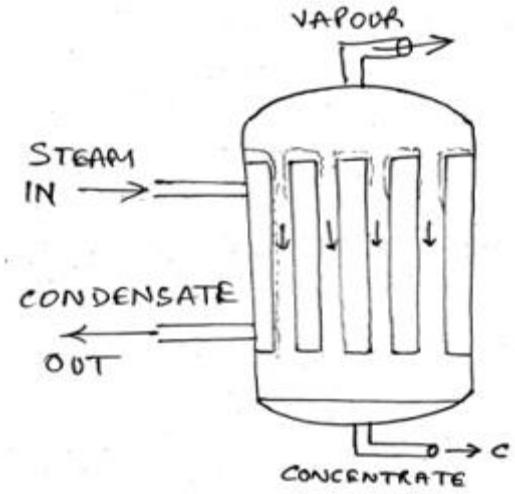
a) Falling Film Evaporator
b) Short-tube Vertical Evaporator
c) Climbing Film Evaporator
d) Basket-type Evaporator

11. Recognize the following evaporator.



a) Falling Film Evaporator
b) Short-tube Vertical Evaporator
c) Climbing Film Evaporator
d) Basket-type Evaporator

12. Recognize the following evaporator.



a) Falling Film Evaporator
b) Short-tube Vertical Evaporator
c) Climbing Film Evaporator
d) Basket-type Evaporator

13. Statement related to the process of evaporation that is incorrect is?
a) Evaporation occurs at any temperature
b) Evaporation takes place within liquid
c) Temperature may change during evaporation
d) No bubbles are formed in liquid during evaporation

14. Rate of evaporation is_____
a) Directly proportional to temperature of liquid
b) inversely proportional to temperature of liquid
c) independent of temperature of liquid
d) directly proportional to humidity of surrounding air

15. Rate of evaporation increases as?
a) Exposed surface area of liquid increases
b) exposed surface area of liquid decreases
c) movement of air above surface of liquid decreases
d) atmospheric pressure increases

16. Rate of evaporation decreases as?
a) temperature increases
b) humidity of surrounding air increases
c) movement of air above surface of liquid increases
d) atmospheric pressure decreases

17. Which of the following factors do not affect the rate of evaporation?
a) Temperature of liquid
b) Humidity of surrounding air
c) Depth of liquid
d) Surface of liquid

18. Evaporation occurs only _____
a) after boiling
b) after extreme cooling
c) at surface of a liquid
d) if boiling occurs at atmospheric pressure

19. Compounds evaporating easily and giving off a smell are?
a) Ionic compounds
b) covalent bonds
c) metallic bonds
d) dative bonds

20. When heating begins in miscible solutions, vapours formed will be?
a) of liquid lower in boiling point
b) of liquid higher in boiling point
c) vapours will be of both liquids with a higher concentration of liquid having low boiling point
d) collected in a gas syringe

21. Evaporation of solution of $CuSO_4$ helps in?
a) Making it concentrated
b) crystallization of $CuSO_4$
c) evaporation of salt $CuSO_4$
d) concentration and crystallization

22. Crystallization, evaporation and distillation are a means of?
a) Separating soluble substances in solution
b) separating insoluble substances in solutions
c) separating filtrate from solution
d) concentration

23. Concentration is different than drying.
a) True
b) False

24. Which of the following is not the reason for the concentration of food liquids?
a) Reduce the cost of drying
b) induce crystallization
c) reduce costs for storage and

transportation
d) increase water activity in order to increase microbiological and chemical

25. Evaporation in dairy industry is a preliminary step to which of the following process?
a) Drying
b) Flavouring
c) Watering
d) Pasteurization

26. Evaporation in dairy industry is done under _____
a) Vacuum
b) Heater
c) Dryer
d) Pasteurizer

27. Which evaporators can be used when a low degree of concentration is required?
a) Falling film evaporator
b) Circular type evaporator
c) Tubular type evaporator
d) Plate type evaporator

28. Dry evaporator is used in A.C. Units of capacity
(a) < 3 tons
(b) < 10 tons
(c) >10 tons
(d) None

29. Flooded evaporator is used in A.C. Units of capacity
(a) < 3 tons
(b) < 10 tons
(c) >10 tons
(d) None

30. In a dry evaporator, refrigerant at the outlet is
(a) in the wet state
(b) Saturated state
(c) Super-heated state
(d) None

31. In a flooded evaporator, refrigerant at the outlet is
(a) in the wet state
(b) Saturated state
(c) Super-heated state
(d) None

32. Flooded evaporator needs at the outlet a
(a) Flash chamber
(b) Accumulator
(c) Inter cooler
(d) None

33. Finned tube evaporators are used in a
(a) Fridge
(b) Window air conditioner
(c) Water cooler
(d) None

34. Bare tube evaporator is used in a
(a) Cold storage plant
(b) Ice plant
(c) Milk Plant
(d) None

35. Evaporator in a refrigeration plant is fitted
(a) Before the condenser
(b) After the condenser
(c) After the compressor
(d) None

36. Evaporator in a refrigeration plant is fitted
(a) Before the condenser
(b) Before the expansion valve
(c) Before the compressor
(d) None

ANSWERS: **EVAPORATOR**

1:	D	13:	b	25:	a
2:	A	14:	a	26:	a
3:	C	15:	b	27:	b
4:	A	16:	b	28:	a
5:	A	17:	c	29:	c
6:	C	18:	c	30:	c
7:	B	19:	b	31:	a
8:	D	20:	c	32:	b
9:	D	21:	d	33:	b
10:	C	22:	a	34:	b
11:	B	23:	a	35:	d
12:	A	24:	d	36:	c

WATER COOLER, BOTTLE COOLER AND DEEP FREEZER

Choose the correct answer.

1. The usual size of a bottle type cooler is –

a. 10 litres b.5litres c.50litres d.25litres

2. Which of the following type water coolers are used where continuous supply of water is not available?

a. bottle type b. storage type c. pressure type d. remote type

3. The water cooler maintains the temperature of water in the range of_____

a. 0^0-13^0C b.13^0-16^0C c.16^0-18^0C d. none of these

4. The tank in a water cooler used for storing water is surrounded on all side by which coil_____

a. evaporator b. condenser c. compressor d. capillary tube

5. Dehydro- freezing is a process involving both dehydration and –

a. Heating b. Preserving c. Freezing d. None of these

6. The formula for water capacity of a water cooler is –

A $Q = M_w C_P (T_i - T_0)$ b. $Q = C_p M_w (T_i - T_0)$ c. $Q = T_i T_0 (C_p - M_w)$ d.$Q = M_w C_P (T_i - T_0)$

7. The correct statement for glass wool is –

a. It is a fibre – like structure b. It is an inorganic substance

c. It is a heat resistance materials d. all of these

8. Which of following the following is an insulating material?

a. Glass wool b. Thermo cool c. Poly urethane d. All of these

9. The appropriate refrigerant is used in a 2-ton water cooler –

a. Ammonia b. SO_2 c. R-22d. both (a) & (b)

10. The following refrigerant is not used in a water cooler –

a. Ammonia b. SO_2 c. R-22d. both (a) (b)

11. The suitable substitute of R-12 is –

a. R-22 b. R-134a c. CCL_2F_2 d. CFC refrigerant

12. The temperature of internal cabinet a bottle cooler is a –

a. 0^0C – 4.5^0C b. 4.5^0C – 7^0C c. 7^0C – 14^0C d. 4.5^0C – 14^0C

13. The temperature of normal drinking water is

a. 10^0C b. 15^0C c. 18^0C d. Depends upon surrounding air temperature

14. For water cooled refrigerant condensers, the typical value of temperature difference between the refrigerant and entering water is –

a. 30C to 4^0C b. 14^0C to 17^0C c. 8^0C to 10^0Cd. 20^0C to 30^0C

15. In a refrigeration system having water cooled condenser, in a hot humid day –

a. The head pressure will be lower b. The head pressure will be higher

c. The head pressure of water-cooled condenser is not affected by high humidity

d. The head pressure of water-cooled condenser is not affected by dry bulb temperature

16. The component used for measuring positive and negative pressure is –

a. pressure gauge b. vacuumed gauge c. compound gauge d. standard gauge

17. It produces cooling in the water cooler –

a. compressor b. condenser c. evaporator d. drier

18. The component used for controlling temperature in a water cooler is –

a. electric motor b. float valve c. relayd. thermostat

19. The internal temperature of a deep freezer is –

a. 0^0C b.1 0^0C c. -25^0C d. 15^0C

20. In which of the following water supplied under pressure?

a. Bottle type water cooler b. pressure type water cooler

c. remote type water cooler d. None of these

21. Which of the following machine is used to cool the drinking water in the bottle?

a. water cooler b. Bottle cooler c. Deep freezer d. d. None of these

22. The temperature of water is controlled in water coolers with the help of –

a. Diode b. on-off switch c. Thermostatic switch d. None of these

23. The main point(s) of concern for a bottle cooler is are-

a. Do not install the unit under the sun b. Gasket should not leak

c. keeps the unit a little away from walls d. All of these

24. Which refrigerant should not be used in a deep freezer?

a. CFC b. HCFC c. HC d. both (a) & (b)

25. The other name for thermocol is –

a. Poly-urethane b. Poly-alkaline C. Poly-styrene d. Poly-ethane

26. Which arrangement is made in storage type water cooler to stop the cool water from flowing upwards?

a. Bubbler b. Bottleneck c. Float d. Tap

27. What is the tank of the water cooler made of?

a. Stainless steel b. Aluminium'sc. Copper d. Brass

28. Which of the following insulating materials does not absorb the moisture in air due to the environment?

a. Wooden shelve b. Fibre Glass c. Glass d. Saw dust

29. Which of the following is the reason of continuous working of a water cooler?

a. Low External Temperature b. Low insulation

c. Correct Charge d. Low water consumption

30. Which of the following is the reason of high discharge of temperature in a VC cooler?

a. Faulty Motor of the Fan b. Faulty Capacitor

c. Faulty Compressor d. Faulty Starting Relay

31. Which of the following is not present in the CSIR wiring of a visible cooler?

a. Starting capacitor b. running capacitor c. Relay d. OLP

32. What is the advantage of the horizontal type bottle cooler?

a. Fan for evaporation blows wind

b. Minimum damage of heat

c. It has commercial uses

d. Its door is visible

33. Where is the direct expansion type water cooler used?

a. In small commercial organizations

b. In storage beverage cooling

c. In milk vending shops

d. In commercial plants

34. What is the name of the sensing element in the thermostat of a bottle cooler?

a. Adjusting screw b. Thermal bulb c. Contact d. Bellows

35. Which of the following deep freezers must have seen through glass doors?

a. Display Case b. Refrigerator c. Upright freezer d. Chest type freezer

36. Which type of colour should be applied on the outer body of a deep freezer?

a. Rust resistant red-oxide b. Powder coated colour

c. Enamel colour d. Oil colour

37. Which component is used to make the door of the deep freezer air tight?

a. Soft rubber lip b. Paper gasket c. Lead d. Tin

38. Which of the following is used to remove the frosted ice from the evaporator coils of a deep freezer?

a. Soft water b. hard water c. Warm water d. Ice water

39. Which of the following insulation is fixable and easy to bend?

a. Thermocol b. Thermoses c. Cork d. PUF

40. What should be the equivalent amount of HC to CFC12 to charge it through load?

a. 70% b. 60% c. 50% d. 40%

41. If HFC 134a refrigerant leaks then it displaces the air because-

a. It is higher than air b. It is heavier than air

c. It is odourless gas d. It is easier than removing

42. Which of the following is the purpose of pump down process?

a. Keeping low state of maintenance

b. Testing the pumping of the compressor

c. Increasing the effect of cooling

d. For gas charging

43. What is the quick and temporary solution for shortage of gas?

a. Mix oil b. Check for any leaks c. Top-up the gas d. pressurizes the unit

ANSWERS: **WATER COOLER, BOTTLE COOLER AND DEEP FREEZER**

1.d	2.b	3.b	4.a	5.c	6.d	7.d
8.d	9.c	10.d	11.b	12.b	13.d	14.c
15.b	16.c	17.c	18.d	19.c	20.b	21.b
22.c	23.d	24.d	25.c	26.c	27.a	28.b
29.b	30.a	31.b	32.b	33.a	34.b	35.a
36.b	37.a	38.c	39.b	40.d	41.b	42.a
43.c						

PSYCHROMETRY

Choose the correct answer

1. The main working substance in air conditioning is _____
   a. Dry air b. Dry ice c. Moist air d. Water vapour
2. The wet bulb temperature is a measure of_____
   a. Relative humidity b. Absolute humidity c. Specific heat d. None of these
3. Which of the following decreases during sensible cooling of air?
   a. Specific humidity b. Dry bulb temp c. Wet bulb temp d. Water vapour
4. For summer air conditioning the relative humidity should not be less than_____
   a. 40% b. 60% c. 75% d. 90%
5. The temperature recorder by a thermometer, when it is not affected by the moisture present in, it is called _____
   a. Wet bulb temp b. Dry bulb temp c. Dew point temp d. None of these
6. In winter air conditioning, the air is _____
   a. Cooled air humidity b. Cooled and dehumidified c. Heated and humidified d. Heated and dehumidified
7. The ambient air temperature as recorded by ordinary thermometer is called_____
   a. Wet bulb temp b. Dew bulb temp c. Dry bulb temp d. Saturation temp
8. The difference between dry bulb temperature and wet bulb temperature, is called
   a. Dry bulb depression b. Wet bulb depression c. Dew point depression d. Degree of saturation
9. Which of the following instrument may be used to determine surface temperature and temperature of inaccessible locations by indicators located at convenient points?
   a. Manometer b. Velometer c. Thermocouple d. None of these
10. Which thermometer helps to find out relative humidity?
    a. Dial thermometer b. Mercury thermometer c. Alcohol thermometer d. Dry and wet bulb thermometer
11. Which of the following chart shows relative humidity?
    a. Temperature chart b. Psychometric chart c. Chilled water chart d. Condenser water chart
12. The temperature at which moisture condenses on a surface is called_____
    a. Grains of moisture b. Wet bulb temperature c. Dry bulb temperature d. Dew point temperature
13. The main working substance in air-conditioning is_____
    a. Dry air b. Dry ice c. Moist air d. Water vapour
14. The air-conditioning means _____
    a. Maintaining the DBT b. Maintaining the WBT c. Maintaining due point temp d. None of these
15. The variable part of moist air is _____
    a. Dry air b. Water vapour c. Both (a) and (b) d. None of these

16. The Dalton's law deals with the _____

    a. Sum partial volumes of gases b. Sum partial pressure of gases c. Sum partial temp of d. Water vapour

17. Psychrometric chart is valid for_____

    a. Water vapour pressure b. Standard atmospheric pressure c. Dry air pressure d. Moist air pressure

18. Dry bulb temperature (DBT) is the actual temperature of _____

    a. Moist air b. Dry air c. Dry ice d. None of these

19. Specific humidity is defined as the ratio of _____
    a. The mass of water vapour to the mass of moist air in a given volume of the mixture
    b. The mass of water vapour to the mass of dry air in a given volume of the mixture
    c. The mass of dry air to the mass of water vapour in a given volume of the mixture
    d. None of these

20. The temperature to which moist air must be cooled at constant pressure before condensation of moisture takes place is known as_____

    a. Wet bulb temperature b. Dew point temperature c. Wet bulb temperature d. Dry bulb temperature

21. For saturated air _____

    a. DBT=WBT b. DPT>WBT c. WBT>DPT d. DBT>DPT

22. Relative humidity is defined as _____
    a. The ratio of the mass of water vapour in a certain volume of moist air at a given temperature to the mass of water vapour in the same volume of saturated air at the same temperature
    b. The ratio of the mass of dry air in a certain volume of moist air at a given temperature to the mass of water vapour in the same volume of saturated air at the same temperature
    c. The ratio of the mass of moist air in a certain volume of moist air at a given temperature to the mass of water vapour in the same volume of saturated air at the same temperature
    d. None of these

23. Wet Bulb Depression (WBD) is the difference between the _____
    a. Dry bulb and dew point temperatures
    b. Dry bulb and wet bulb temperatures
    c. Wet bulb and dew point temperatures
    d. None of these

24. For unsaturated air_____

    a. DBT=WBT b. DPT=WBT c. DBT>WBT d. None of these

25. In summer air comfort air-conditioning, the optimum inside design conditions are _____
    a. DBT=24±1^{o}C and RH 45±5%
    b. DBT=25±1^{o}C and RH 50±5%
    c. DBT=25±1^{o}C and RH 45±5%
    d. None of these

ANSWERS: **PSYCHROMETRY**

1:	C	11:	b	21:	a
2:	B	12:	d	22:	a
3:	B	13:	c	23:	b
4:	B	14:	a	24:	d
5:	B	15:	b	25:	b
6:	C	16:	b		
7:	C	17:	b		
8:	B	18:	a		
9:	C	19:	b		
10:	D	20:	b		

DUCT

1. This type of duct requires least material for carrying air _____

   a. Rectangular b. Square c. Circular d. All of these
2. Which of the following an air handling system consists?

   a. Air distribution system b. Duct system c. Fan d. All of these
3. Which of the following tool is used for refacing the seats of different types of connectors?

   a. Refacing b. Swaging c. Cutting d. None of these
4. In which of the following ways the supply ducts may be arranged?

   a. Loop perimeter duct system b. Radial perimeter duct system c. Extended perimeter duct system d. All of these
5. Resistivity of a wire depends on _____

   a. Length b. Material c. Cross section area d. None of these

6. In dual-conduit system of all-air system of air-conditioning_____
   a. There are two separate air systems
   b. One of the two conduits is permanent by supplying cold and variable air volume for fluctuating internal and solar loads
   c. One of the two conduits supplies constant volume but variable temperature air for varying building transmission losses
   d. All of these
7. In which of the following air conditioning system zoning and duct work are eliminated?
   a. Central air conditioning system
   b. Unitary air conditioning system
   c. Zoned air conditioning system
   d. None of these
8. Which coating is applied on mild steel fabricated duct?

   a. Oil b. Epoxy c. Paint d. powder
9. The gap between the false ceiling and the main ceiling is referred as _____

   a. Supply air duct b. Return damper c. Diffuser d. plenum
10. Which arrangement avoids the foul smell coming inside through drain line in AHU?

    a. NRV b. S trap c. U trap d. Shut off valve
11. Where the heat transfer will be faster when compared to AHU?

    a. Fan coil unit b. Air washer unit c. Window unit d. Split unit
12. What is the best performance of the fan selected for duct system?

    a. Heavy vibration b. Maximum throw c. Minimum noise d. Running fast
13. The total pressure through a duct is equal to the sum of _____
    a. Partial pressure of water vapour + velocity pressure
    b. Velocity pressure + static pressure + datum pressure head
    c. Static pressure + datum pressure head
    d. Velocity pressure + datum pressure head
14. Pressure drop in ducts take place because of _____

    a. Duct friction b. Change of direction c. Change of Velocity d. All of these
15. This type of duct requires least material for carrying air_____

a. Rectangular b. Square c. Circular d. Trapezoidal

16. The ducts are mostly made of _____

a. Wood b. Expanded polystyrene c. Fibre glass d. GI sheet

17. In a low pressure duct system _____
    a. Velocities < 600 mpm and static pressure ≤ 5 cm H_2O gauge
    b. Velocities < 500 mpm and static pressure ≤ 5 cm H_2O gauge
    c. Velocities < 400 mpm and static pressure ≤ 5 cm H_2O gauge
    d. Velocities < 350 mpm and static pressure ≤ 5 cm H_2O gauge
18. The various methods of duct design are _____

a. Equal friction method b. Velocity reduction method c. Static regain method d. All of these

19. AHU stands for _____

a. Air Handling Unit b. Air Heating Unit c. Air Humidifying unit d. None of these

20. Which is the following is the example of spiral duct?

a. Inflexible duct b. Flexible duct c. Prefabricated duct d. All of these

21. The component fitted inside the duct is _____

a. Condenser b. Condenser fan c. Evaporator coil d. Compressor

22. What change occurs in the size of the duct when we go further into it?

a. It increases b. It decreases c. It remains unchanged d. None of these

23. The example of primary air in a ducting system is _____

a. Supply air b. Return air c. Mixed air d. None of these

24. What do the sensors in the ducting simulation control?

a. Temperature b. Pressure c. Humidity d. All of these

25. Mode with sensor for detecting various faults in ducting is _____

a. Ducting control b. Ducting simulation c. Error detection d. None of these

26. The possible reason of sudden noise in the system is _____

a. Wear and tear in the unit b. Damage in air filter c. Blower stops operating d. Damage fuse

27. The possible reason of non-operation of the system is_____

a. Wear and tear in the unit b. Damage in air filter c. Blower stops operating d. Damage fuse

28. The reason due to which system fails to provide cooling is _____

a. Wear and tear in the unit b. Damage in air filter c. Blower stops operating d. Damage fuse

29. The component used for reducing the size of the duct is _____

a. Reducer b. Pipe c. Register d. Damper

Answer: **DUCT**

1:	A	11:	b	21:	c
2:	D	12:	c	22:	b
3:	A	13:	b	23:	a
4:	D	14:	d	24:	d
5:	B	15:	c	25:	b
6:	C	16:	d	26:	a
7:	B	17:	a	27:	d
8:	B	18:	d	28:	a
9:	D	19:	a	29:	a
10:	C	20:	b		

HVAC PLANT

1. What is the composition of oxygen in atmospheric air

a. 11% b. 21% c. 31% d. 41%

2. What is the expansion of ADP?

a. Apparatus due point b. Advanced detection process c. Advance distributor process d. Advance durability promotion

3. Which design data is used for indoor air summer air conditioning?
   a. 20°C ± 1°C and 30% RH
   b. 22°C ± 1°C and 40% RH
   c. 24°C ± 1°C and 50% RH
   d. 26°C ± 1°C and 50% RH

4. Which atmospheric standard air is used in calculating air velocity?

a. 23°C and 760 mm b. 22°C and 760 mm c. 21°C and 760 mm d. 20°C and 760 mm

5. Which types of heat are considered for occupants' heat gain in AC space?

a. Radiant and latent heat b. Sensible and latent heat c. Sensible and radiant heat d. Specific and sensible heat

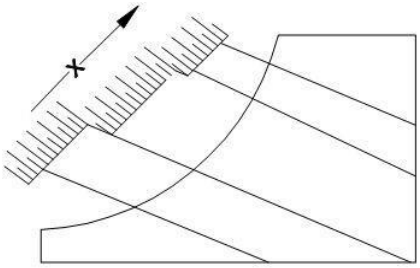
6. What is the minimum quantity of fresh air needed per person in comfort AC?

a. 3 to 4.5 cfm b. 4 to 5.5 cfm c. 5 to 7.5 cfm d. 2 to 3.5 cfm

7. How the reciprocal of air density is mentioned in psychrometric chart?

a. Specific gravity b. Specific heat ratio c. Sensible heat ratio d. Specific volume per unit mass

8. Which is expressed in the scale marked along X?



a. Entropy b. Enthalpy c. Latent heat d. Sensible heat

9. Which instrument is used to measure the velocity pressure of air in ducting system?

a. Nanometre b. Pitot tube c. Barometer d. Bourdon tube

10. Which instrument measures the humidity of air?

a. Barometer b. Manometer c. Hygrometer d. Hydrometer

11. Which psychometric process takes place if the air is passed through hygroscopic chemicals?

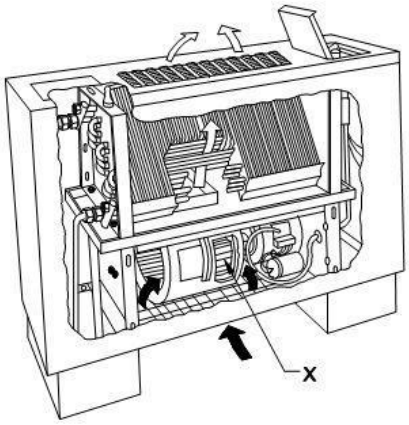
a. Sensible heating of air b. Heating and humidification c. Heating and cleaning of air d. Heating and dehumidification

12. Which process increases the specific humidity of air at constant dry bulb temperature?

a. Humidification of air b. Sensible cooling of air c. Sensible heating of air d. Dehumidification of air

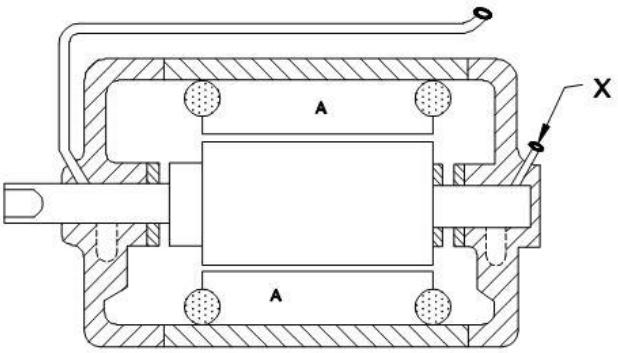
13. Which process decreases the dry bulb temperature of air at constant specific humidity?
   a. Humidification of air
   b. Sensible cooling of air
   c. Sensible heating of air
   d. Dehumidification of air

14. What is the name of part marked as x in a Fan Coil Unit?



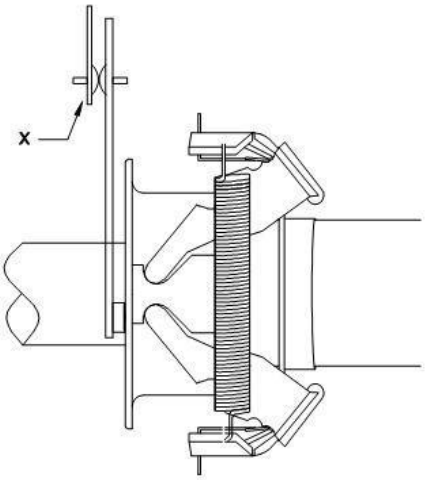
a. Fan scroll b. Filter Pad c. Main Drain Pan d. Coils Fan Motor

15. What is the direction of airflow delivered in a centrifugal blower?
    a. Parallel to the shaft
    b. Inclined throw of air vertically
    c. Perpendicular to the shaft
    d. Inclined throw of air horizontally
16. What is the name of part marked as x in a fan motor?



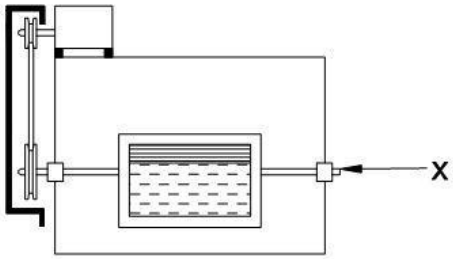
a. Stator b. Rotor c. Oil cup d. Bearings

17. What is the name of part marked as x in the centrifugal switch?



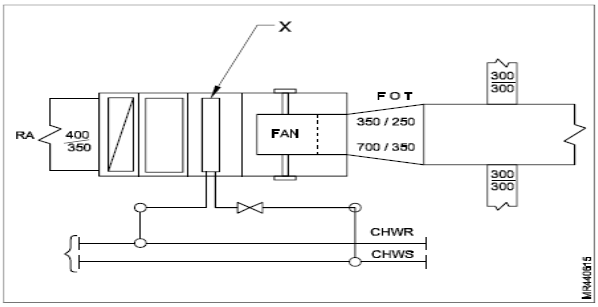
a. Spring b. Shaft lever c. Contact points d. Centrifugal weight
18. Which property is considered for a temperature range in selecting a lubricant oil?

a. Natural b. Artificial c. Viscosity d. Cost effective
19. What is the name of part marked as x in belt driven type fan?



a. Scroll b. Wheel c. Bearings d. Belt guard

20. What is the name of part marked as x in AHU?



a. Fan b. Wheel c. Bearings d. Belt guard

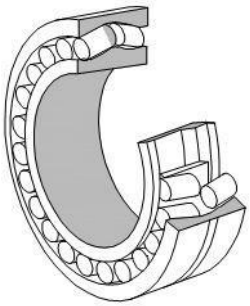
21. Which device controls the air flow in ducting system?

a. Grille b. Damper c. Register d. Diffuser

22. What is phenotherm?

a. A ducting clamp
b. An insulation material
c. A chemical substance
d. Temperature measuring device

23. What is the type of bearing?



a. Ball bearing
b. Spherical roller bearing
c. Tapered roller bearing
d. Cylindrical roller bearing

24. What is the wet bulb temperature of air if dry bulb temperature is 35°C and wet bulb depression is 4°C?

a. 31°C b. 32°C c. 33°C d. 34°C

25. What is the dew point depression of air if dry bulb and dew point temperatures are 36°C and 32°C respectively?

a. 2°C b. 4°C c. 6°C d. 8°C

26. Which parameter of air is measured by the thermometer bulb that is wetted in sling psychrometer?

a. Dew point temperature
b. Dry bulb temperature
c. Wet bull temperature
d. Evaporating temperature

27. Which temperature is measured first in sling psychrometer after whirling?

a. Dry bulb temperature of air
b. Wet bulb temperature of air
c. Absolute temperature of air
d. Accurate temperature of air

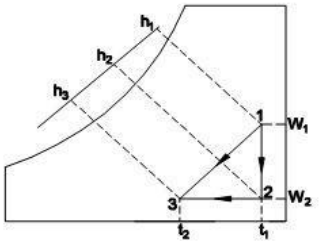
28. Which compressor capacity is suitable for 2 TR air conditioner?

a. 3000 Kcal/h b. 4000 Kcal/h c. 5000 Kcal/h d. 6000 Kcal/h

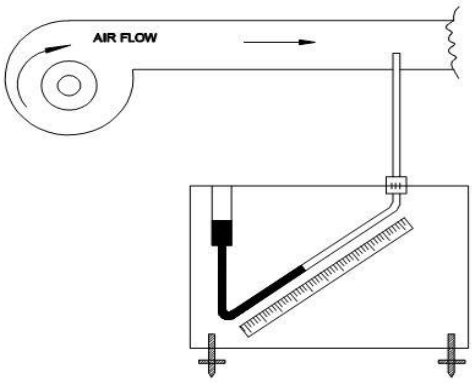
29. How many parameters are needed to locate all properties of moist air in psychrometric chart?

a. One b. Two c. Four d. Three

30. Which temperatures are marked on 100% RH curve?
    a. Air and water
    b. Wet-bulb and dew point
    c. Critical and condensing
    d. Evaporating and condensing
31. What is measured by Anemometer?
    a. Velocity of air
    b. Direction of air-flow
    c. Total pressure of air
    d. Static pressure of air
32. Which psychrometer uses battery operated small fan?
    a. Sling psychrometer
    b. Aspirating psychrometer
    c. Laboratory psychrometer
    d. Exhausting psychrometer
33. Which psychrometric processes are represented between initial (t1) and final (t2) conditions of air in the chart?



    a. Cooling and humidification
    b. Heating and humidification
    c. Sensible cooling and heating
    d. Cooling and dehumidification
34. What is the velocity pressure of air in a duct if the total pressure and static pressure are known?
    a. Sum of static and total pressures
    b. Sum of dynamic and total pressures
    c. Difference in static and total pressures
    d. Difference in dynamic and total pressures
35. What is measured by the manometer in duct air?



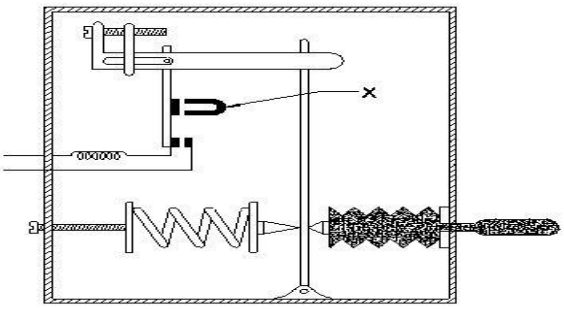
    a. Total pressure
    b. Static pressure
    c. Velocity pressure
    d. Absolute pressure
36. What is the volume of air passed at the outlet of a rectangular duct whose area of cross section is 1m2 and the air velocity by an anemometer is 10m/min?

a. 5 m3 b. 10 m3 c. 15 m3 d. 20 m3

37. How the power consumed by the motor varies with its speed in VFD?
    a. Cube of its speed
    b. Square of its speed
    c. No change with speed
    d. Inversely proportional to its speed
38. Which parameter of power supply determines the speed of induction motor?

a. Volt b. Current c. Volume d. Frequency

39. Which type of load consumes more energy in an AC plant system?
    a. Air ventilation
    b. Air distribution
    c. Water circulation
    d. Heating and cooling
40. What is the purpose of part marked as X in thermostat?



a. Maintains temperature
b. Warms up movable contact
c. Switching snaps ON
d. Controls the expansion of bellows

41. Which part of electronic filter removes tobacco smoke and odours?

a. Pre filter
b. Electrodes
c. Charcoal filter
d. Static electric field

42. What is the purpose of air filter?

a. Cool air
b. Circulate air
c. Ensure clean air
d. Improve performance

43. How the space between the false ceiling and the building main ceiling is used in handling of air in central AC plant?

a. Exhaust duct
b. Fresh air duct
c. Return air duct
d. Supply air duct

44. Which system maintains indoor air quality by adding fresh air and conditioned air to offset heating or cooling loads?
a. Refrigeration system
b. Air distribution system
c. Electrical control system
d. Refrigerant control system

45. Which fan is used to handle the direction of air flow 90° away from the inlet?
a. Axial propeller fan
b. Centrifugal blower fan
c. Tube axial propeller fan
d. Vane axial propeller fan

46. Why the capacitor is tested inside a box or case?
a. Explodes safely
b. Erodes the test kit
c. Corrodes the test kit
d. Releases poisonous gas

47. Why the AHU outlet is connected to supply duct with canvas material?
a. Quick replacement
b. Low installation cost
c. Low maintenance cost
d. Avoid vibration of air transmission

48. Why the crankcase heater is energised for compressor during the shut down period of AC plant?
a. Increase viscosity of crankcase oil
b. Decrease viscosity of crankcase oil
c. Increase miscibility of oil with refrigerant
d. Prevent oil foaming on restarting compressor

Answers **HVAC PLANT**

1:	B	13:	b	25:	b	37:	a
2:	A	14:	a	26:	c	38:	d
3:	C	15:	b	27:	b	39:	d
4:	C	16:	c	28:	d	40:	c
5:	B	17:	c	29:	b	41:	c
6:	C	18:	c	30:	b	42:	c
7:	D	19:	c	31:	a	43:	c
8:	B	20:	d	32:	b	44:	b
9:	B	21:	b	33:	d	45:	b
10:	C	22:	b	34:	c	46:	a
11:	D	23:	b	35:	b	47:	d
12:	A	24:	b	36:	b	48:	d

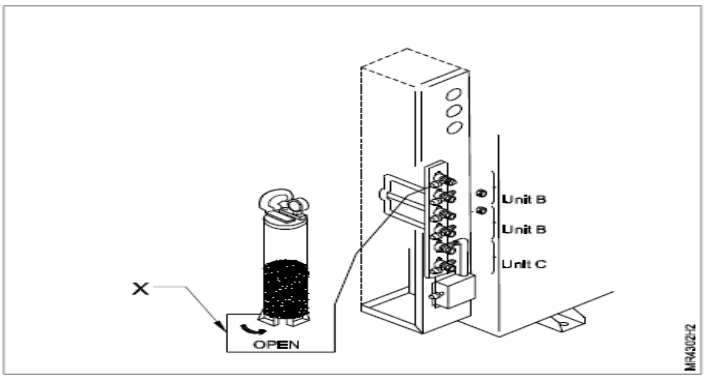
PACKAGE AIR CONDITIONER

1. What is the equivalent of 1 mm of Hg in terms of microns?

   a. 500 b. 1000 c. 1500 d. 2000

2. Which tool is used for service valve operations in package AC?
   a. Cutting pliers
   b. Screw spanner
   c. Ratchet key/wrench
   d. Double end spanner

3. What is the name of line marked as x?



   a. Liquid line b. Suction line c. Delivery line d. Charging line

4. Which is the minimum vacuum level preferred in microns before gas charging a system?

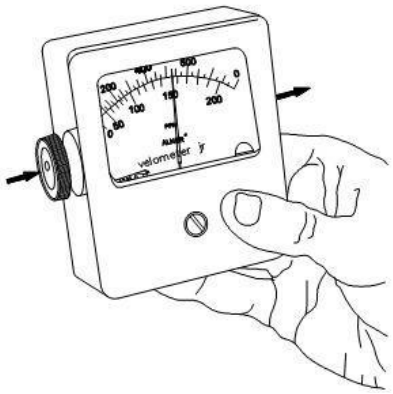
   a. 2000 b. 1750 c. 750 d. 500

5. Which safety device is attached to nitrogen cylinder?
   a. Fuse plug
   b. Compound gauge
   c. Two stage pressure regulator
   d. Automatic pressure bypass valve

6. Which is eliminated from the system in vacuumising process?

   a. Humidity b. Moisture c. Pressure d. Temperature

7. What is the name of meter?

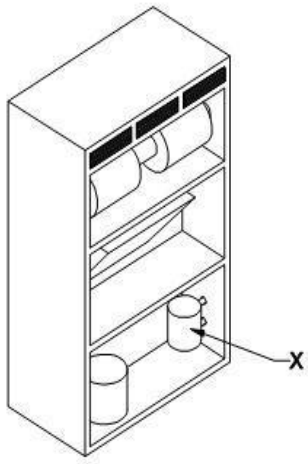


   a. Hot wire anemometer
   b. Rotating vane anemometer
   c. Deflecting vane anemometer
   d. Direct reading air velocity meter

8. Which instrument indicates the correct floor level to install package unit?

   a. Sprit level b. Tee square c. Screw gauge d. Vernier caliper

9. What is the name of component marked as X in self contained package unit?



a. Liquid receiver
b. Scroll compressor
c. Water cooled condenser
d. Return air chamber from room

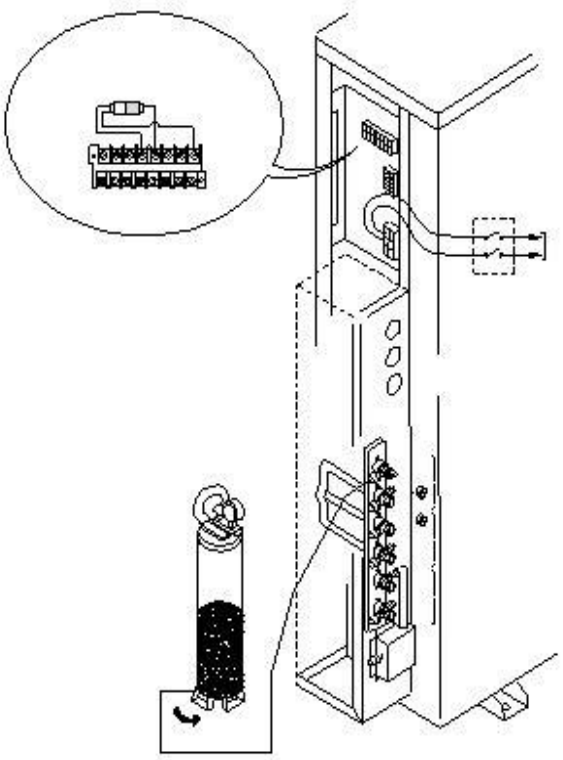
10. Where to assemble all the controls, microprocessor display board and indicating LED in package AC?

a. DOL b. Body c. Panel board d. Blower compartment

11. What is the minimum temperature difference in water required between inlet and outlet of water cooled condenser?

a. 5°C b. 15°C c. 10°C d. 20°C

12. What is the name of part zoomed in?



a. Power supply b. Terminal plate c. Charging cylinder d. Charging cylinder

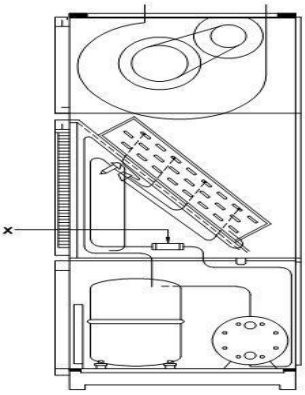
13. Which colour code indicates the earth wire in power supply cord?

a. Red b. Black c. Brown d. Green/yellow

14. How much cut out point is set in high pressure control in package AC using R-22?

a. 12 kg/cm2 b. 15 kg/cm2 c. 17 kg/cm2 d. 20 kg/cm2

15. What is the name of part marked as x in package AC?



a. TXV b. OLP c. Distributor d. Filter drier

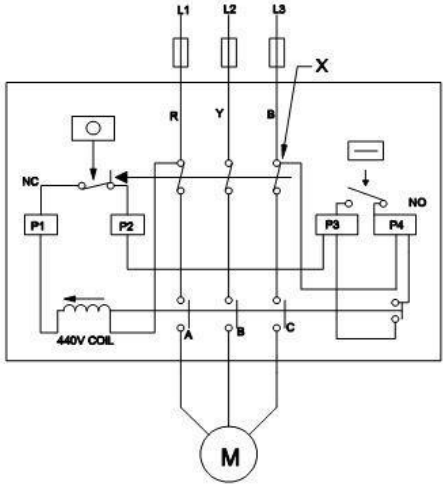
16. Which thermistor s resistance increases if the temperature is decreased?

a. PTC b. NTC c. VDR d. LDR

17. What is the limitation for DOL starters in package AC?

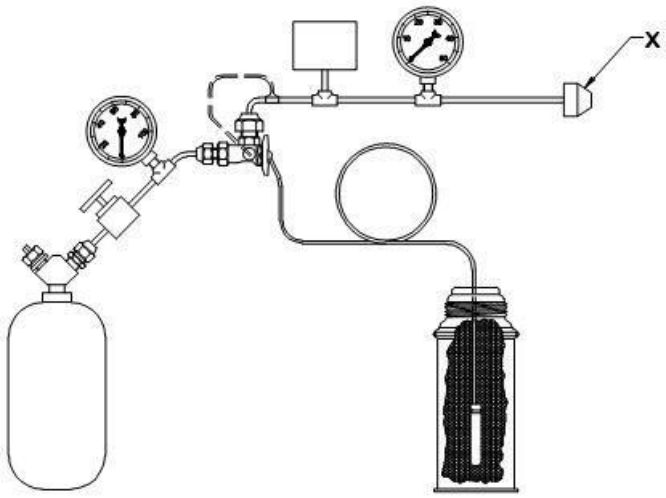
a. Up to 3 HP b. Up to 5 HP c. Up to 8 HP d. Up to 10 HP

18. What is the name of component marked as x in motor starter?



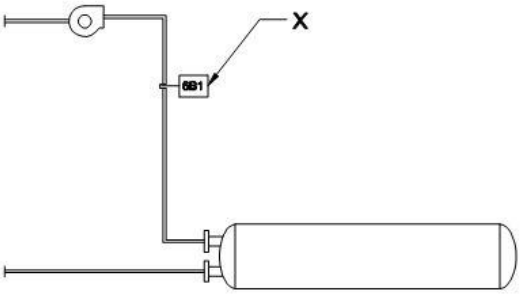
a. PTC relay b. Thermostat c. Thermal OLP d. Selector switch

19. What is the name of part marked as x in testing thermostatic expansion valve?



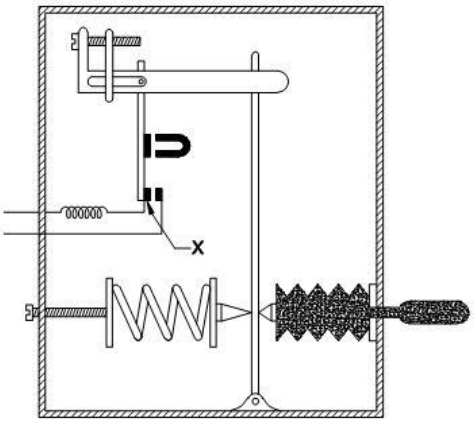
a. Feeler bulb
b. Expansion valve
c. Adjustable drill bleed
d. High pressure supply line

20. What is the name of safety switch marked as x in package AC?



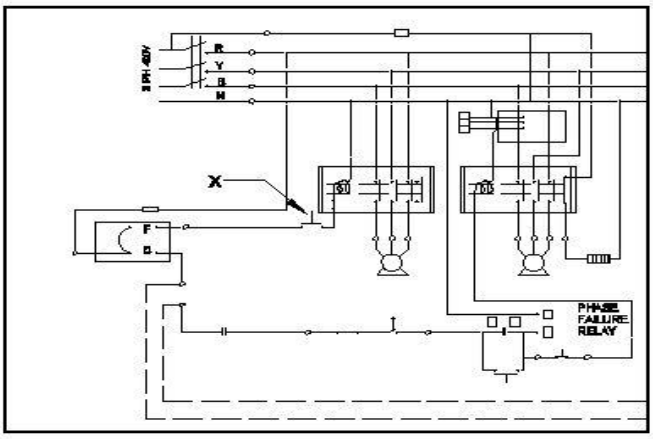
a. Oil flow switch
b. Gas flow switch
c. Water flow switch
d. Pressure flow switch

21. What is the name of part marked as x in thermostat?



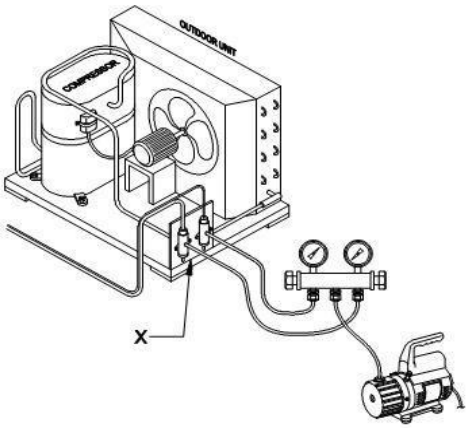
a. Bellows
b. Movable contact
c. Stationary contact
d. Differential adjustment

22. What is the name of component marked as x in wiring of package AC?



a. Heater
b. DOL starter
c. Pressure stat
d. Internal thermostat

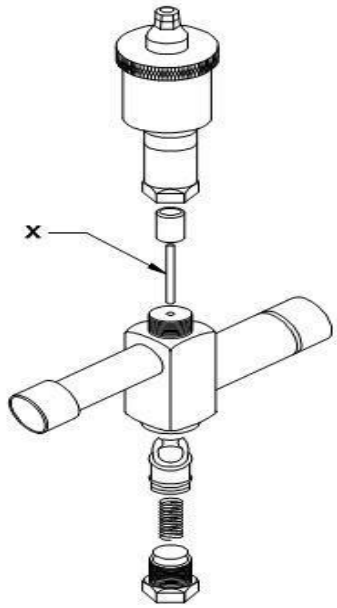
23. What is the name of component used in vacuumising process at ductable split AC?



a. Fan motor
c. Three way service valve

b. Condenser
d. Direct drive vacuum pump

24. Which AC connects the indoor evaporator unit with outdoor condenser unit through a wall hole of 7cm diameter?
    a. Split air-conditioner
    b. Window air-conditioner
    c. Three way service valve
    d. Industrial air-conditioner
25. What is the name of part marked as x in electronic expansion valve?



a. Cap
b. Push rod
c. Valve body
d. Piston assembly

26. What is the periodical checking for blower belt in package AC?

a. Daily
b. Yearly
c. Weekly
d. Monthly

27. What is the preventive maintenance schedule of blower motor s speed and end play in package AC?

a. Daily
b. Yearly
c. Weekly
d. Monthly

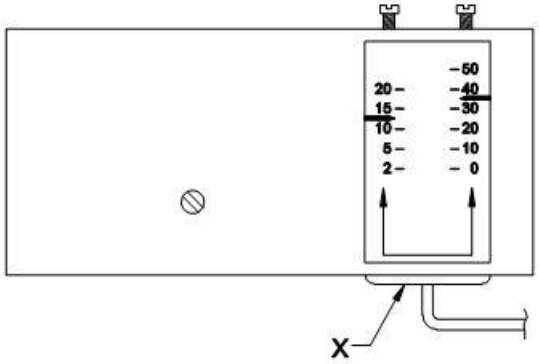
28. Which is scheduled for yearly maintenance in package AC?
    a. Wash the air filter
    b. Tighten the blower belt
    c. Clean the cooling tower
    d. Tighten the pump gland nut
29. Which type of processor control is used for safety in package air conditioner?

a. Electric
b. Mechanic
c. Electronic
d. Pneumatic

30. Which component absorbs heat from return air in package AC?

a. Blower
b. Condenser
c. Evaporator
d. Expansion valve

31. What is the name of part marked as x in low pressure cut out switch?



a. Cover
b. Diaphragm
c. Sensing line
d. Cut-in adjustment

32. Which schedule is followed for lubricating the cooling tower fan motor in package AC?

a. Daily b. Weekly c. Biweekly d. Quarterly

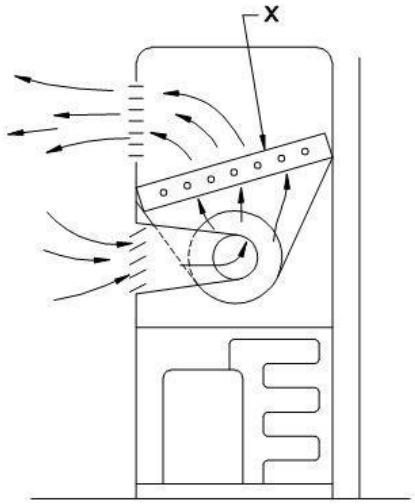
33. Where the air temperature is measured to check the performance of package AC?

a. Supply grille b. Blower inlet c. Atmosphere d. Condenser outlet

34. Which switch is interlocked to become on if the power isolator is off in package AC?

a. Thermostat b. Blower motor c. Crankcase heater d. Compressor starting

35. What is the purpose of installing the part marked as x in console type package air conditioner?



a. Cool the air
b. Force the air
c. Force the gas
d. Cool the water

36. Which valve is opened first after installing the package AC for test run?

a. Ball valve b. Globe valve c. Service valve d. Solenoid valve

37. What is measured by clamp tester during “Test run” of package AC?

a. Idle pressure
b. Running current
c. Rotation per minute
d. Vacuum holding strength

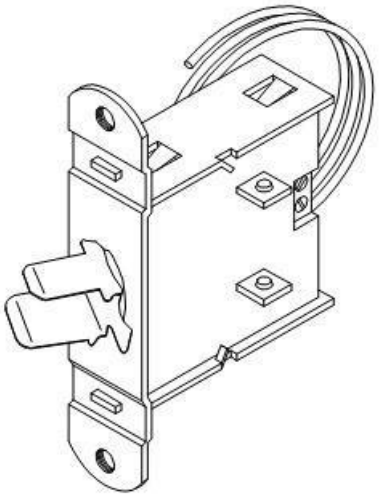
38. What is the purpose of TEV in refrigeration cycle of package AC?

a. Condensing gas
b. Throttling refrigerant
c. Flush out dry nitrogen
d. Cooling the evaporator

39. Which safety control is actuated by excess of heat /current in package AC?

a. Selector switch
b. Over load relay
c. Water flow switch
d. High pressure cut-out

40. Which is controlled by the component in package AC?



a. Power b. Gas flow c. Temperature d. Water pressure

41. Which control terminals are shorted before pump down operation in package AC?
    a. Selector switch
    b. H.P cut-out switch
    c. L.P cut-out switch
    d. Thermostat switch

42. Which valve is kept closed to check the function of low pressure switch?
    a. Reed valve
    b. Suction valve
    c. Liquid line valve
    d. Discharge service valve

43. What is the advantage of water pressure cut out switch in package AC?
    a. Raise condensation
    b. Improve evaporation
    c. Protect the compressor
    d. Increase refrigerant flow

44. Which safety control is manually reset after rectifying the faults in packages AC?

    a. LP b. HP c. OLP d. OILP

45. Which safety switch deactivates the compressor motor circuit if suction pressure falls below the safe limit in package AC?
    a. Selector switch
    b. Low pressure switch
    c. High pressure switch
    d. Dual pressure switch

46. How to position the liquid line valve to start the pump down operation in split AC?

    a. Closed b. Opened c. Back seated d. Back seat crack

47. What is the position of knob selected in thermostat to check its working condition in package AC?

    a. Fan only b. Low cool c. High cool d. Medium cool

48. Which document is used for writing the AC system parameters round the clock?

    a. Log sheet b. Trip sheet c. Note sheet d. Plain sheet

49. Which operation is carried out first in selector switch after installation of package AC?
    a. Compressor 1
    b. Compressor 2
    c. Blower - low speed
    d. Blower - high speed

50. What is the remedy for scaled up water tubes of water cooled condenser?
    a. Clean the surface
    b. Descale the condenser tubes
    c. Wipe the condenser fins
    d. Wash the condenser with soap water

51. What is the remedy for insufficient cool supply air from package AC?
    a. Check for gas leak
    b. Repair the compressor
    c. Flush out the condenser
    d. Replace the blower belt

52. What is the cause for compressor cut off by HP cut out in package AC?
    a. Aged wire
    b. Compressor grounded
    c. Cooling tower fan failure
    d. Mild gas leak in evaporator

53. What is the preventive remedy for scale in water cooled condenser tubes in package AC?
    a. Install flow meter
    b. Minimise water flow
    c. Improve water quality
    d. Increase water pressure

54. What is the remedy for loosened one belt in multidrive belts of blower unit?
    a. Align the drive pulley
    b. Remove the loosened one
    c. Align the driven pulley
    d. Replace the whole set of belts

55. What is the remedy for noisy blower with excessive axial play in AHU?
    a. Apply grease
    b. Change belts
    c. Replace blower unit
    d. Change the air filter

56. Why the water flow switch is bypassed to test the HP control switch in package AC?
    a. Make the unit not to trip
    b. Raise the oil pressure more
    c. Stopping the unit immediately
    d. Lower the head pressure in compressor

57. Which parameter of heater element is increased in OLP due to hot compressor dome?

    a. Voltage b. Resistance c. Capacitance d. Magnetic field

58. What is the effect on compressor motor if water pressure switch trips out in package AC?

a. Does not stop b Stops working c Does not start d. Motor burns out

59. What is the effect on adjusting the thermostat differential too close in package AC?

a. Unit does not start
b. Normal cooling effect
c. Unit runs continuously
d. Unit starts and stops frequently

60. What is the reason for switching contacts get carbonised in package AC electrical wiring?

a. Humidity
b. Quality is bad
c. Loose connections
d. Too tight connection contacts

Answer: **PACKAGE AIR CONDITIONER**

1:	B	16:	b	31:	b	46:	a
2:	C	17:	b	32:	d	47:	b
3:	D	18:	c	33:	a	48:	a
4:	D	19:	c	34:	c	49:	c
5:	C	20:	c	35:	a	50:	c
6:	B	21:	b	36:	b	51:	d
7:	D	22:	b	37:	b	52:	c
8:	A	23:	c	38:	b	53:	c
9:	C	24:	a	39:	b	54:	d
10:	C	25:	b	40:	c	55:	c
11:	A	26:	c	41:	c	56:	a
12:	B	27:	d	42:	c	57:	b
13:	D	28:	c	43:	c	58:	b
14:	D	29:	c	44:	b	59:	d
15:	D	30:	c	45:	b	60:	c

CENTRAL AIR CONDITIONING

1. Which RAC system belongs to centralised air conditioning?

a. Split AC b. Window AC c. Cassette AC d. Chiller plant AC

2. What is the percentage of HCl used for making descaling solution with water?

a. 1% b. 5% c. 15% d. 55%

3. Which instrument is used to measure the total pressure in an air duct?

a. Hygrometer b. Velocimeter c. Anemometer d. Pitot tube manometer

4. What is meant by total pressure in a duct?
   a. Velocity pressure - static pressure
   b. Static pressure + velocity pressure
   c. Velocity pressure + suction pressure
   d. Suction pressure + discharge pressure

5. Which device controls the moisture in AC room air?

a. Humidistat b. Hydrometer c. Hygrometer d. Anemometer

6. Which part of a central AC system cannot be repaired after pump down operation?

a. Condenser b. Evaporator c. Liquid receiver d. Expansion device

7. Which device is installed in ducts to control air flow?

a. Grille b. Damper c. Diffuser d. Register

8. Which components are used in AHU of central AC plant?
   a. Blower, Air filter, Evaporator
   b. Condenser, Fan, Compressor
   c. Evaporator, Compressor, Blower
   d. Air filter, Compressor, Condenser

9. Which component removes the burrs and moisture from the circulating refrigerant in AC plant?

a. Air filter b. Filter drier c. HEPA filter d. Oil strainer

10. Which differentiates the industrial AC compared to domestic AC system?
    a. Blowers are used
    b. Separate plant room
    c. Condensation of refrigerants
    d. Filters for air and refrigerants

11. What is the purpose of using the water cooled condenser in industrial AC plant?
    a. Reduce the pressure
    b. Increase the temperature
    c. Reject more heat to water
    d. Absorb less heat from system

12. Which T across water tubes indicates the shell and tube condenser for decaling process?

a. 2°C b. 3°C c. 4°C d. 5°C

13. Which part of the working refrigeration system, the non condensable accumulate?
    a. Accumulator
    b. Top of condenser
    c. Evaporator outlet
    d. Compressor crankcase

14. What is the evaporator surface temperature maintained in dehumidifier?
    a. Above dry bulb temperature of air
    b. Below dry bulb temperature of air
    c. Above dew point temperature of air
    d. Below dew point temperature of air

15. What is the purpose of using humidistat in an industrial AC plant?
    a. Purifies air
    b. Add moisture to air
    c. Control humidity of air
    d. Remove moisture from air

16. What is the purpose of cooling tower in central AC plant?
    a. Cool the chilled water
    c. Cool the liquid refrigerant

b. Maintain refrigerant flow
d. Cool the condenser water

17. Which part of water pump becomes worn out fast?

a. Bearing
b. Impeller
c. Water seal
d. Shaft sleeve

18. What is the preventive maintenance of cooling tower sump?
a. Remove sludge
b. Flush with water
c. Add HCL to water
d. Add bleaching powder

19. Which suction line pressure ensures that the compressor is to be stopped during pump down operation?

a. 3 kg/cm2
b. 5 kg/cm2
c. 0.5 kg/cm2
d. - 0.5 kg/cm2

20. Which device is used to measure the static and total pressure of air in ducting systems?

a. Pitot tube
b. Gauge manifold
c. Pressure gauge
d. Compound gauge

21. Why the stainless-steel metal is used to make evaporator in ice plant?

a. Erosive
b. Galvanic
c. Reactive
d. Non corrosive

22. Which gauge is connected to the AC plant system before doing pump down operation?
a. Compound gauge
b. Oil pressure gauge
c. High pressure gauge
d. Water pressure gauge

23. Why the glass wool insulation is avoided in ducts?
a. Less strength
b. High conductivity
c. Not resistant to water
d. Allows vapour transmission

24. What is the effect of scale formation inside the tubes of chiller in industrial AC plant?
a. Reduce heat transfer
b. Increase heat transfer
c. Increase suction pressure
d. Decrease power consumption

25. Which parameter is checked if the air flow in supply duct is reduced in central AC plant?
a. Condenser temperature
b. Cooling water temperature
c. Blower motor ampere/speed
d. Compressor discharge temperature

26. What is the effect of residual acid particles after descaling the shell and tube condenser in industrial AC plant?
a. Block the strainer
b. Corrode the tubes
c. Reduce heat transfer
d. Increase algae growth

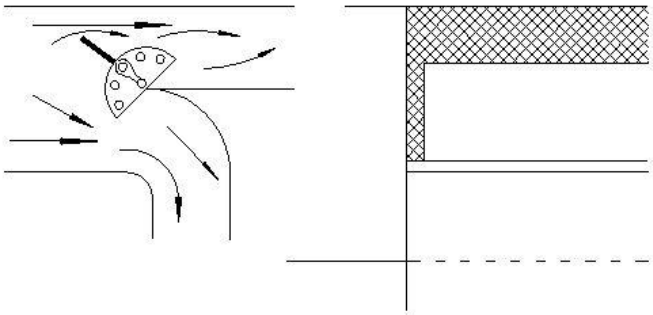
27. What is the effect of partially choked thermostatic expansion valve in central AC plant?
a. Iced condenser
b. Frosted evaporator
c. Hot expansion valve
d. Frosted expansion valve

Answer: **CENTRAL AIR CONDITIONING**

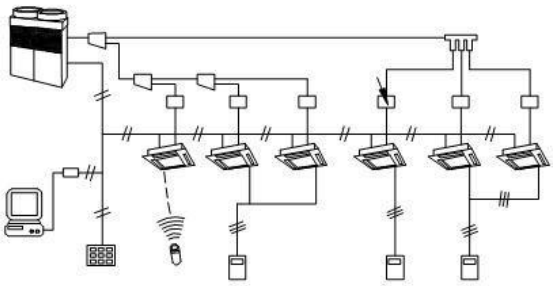
1:	D	10:	b	19:	c
2:	B	11:	c	20:	a
3:	D	12:	d	21:	d
4:	B	13:	b	22:	a
5:	A	14:	d	23:	d
6:	C	15:	c	24:	a
7:	B	16:	d	25:	c
8:	A	17:	d	26:	b
9:	B	18:	a	27:	d

DIRECT EXPANSION AIR CONDITIONING

1. Which tool is used for descaling the condenser tubes in shell and tube condenser?
   a. Steel brush
   b. Brass brush
   c. Sponge brush
   d. Teflon fibre brush
2. What is the name of damper inside the duct?



   a. Single vane
   b. Splitter
   c. Butterfly
   d. Multiple vane
3. What is the expansion of PMV used in VRV system?
   a. Prime Mover Valve
   b. Pass Modulate Valve
   c. Phase Modulate Valve
   d. Pulse Modulating Valve
4. Which electronic component senses the temperature in indoor unit of VRV system?
   a. Resistor
   b. Thyristor
   c. Transistor
   d. Thermistor
5. Which type of AC system is operated by VRV system?
   a. Package AC
   b. Central plant AC
   c. Multizone split ACs
   d. Indirect ACs
6. Which set of components are used in FCU?
   a. Air filter, blower, condenser
   b. Compressor, fan, condenser
   c. Air filter, cooling coil, blower motor
   d. Cooling coil, condenser, fan motor
7. Which is circulated in VRV system for cooling cycle?
   a. Water
   b. Cooled air
   c. Cooled brine
   d. Liquid refrigerant
8. What is the type of cooling system?



   a. VRF
   b. VAV
   c. CAV
   d. Central plant AC
9. What is the expansion of HVAC?
   a. Heavy Vehicle Air Conditioning
   b. Heating, Vibration, Auto Correction
   c. Heating, Ventilation Automatic Control
   d. Heating, Ventilation and Air Conditioning
10. Which valve is used for gas charging and pressure checking in central AC plants?
    a. Safety valve
    b. Service valve
    c. Solenoid valve
    d. Non return valve
11. What is the value of absolute vacuum in millimetres of mercury?
    a. -76
    b. - 760
    c. - 14.7
    d. - 10.33

12. Which compressor is used only in central AC systems?

a. Scroll b. Screw c. Rotary d. Centrifugal

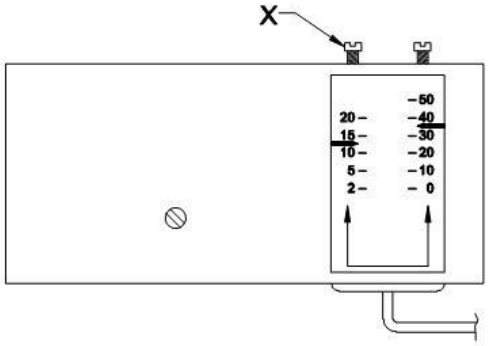
13. What is the benefit of preventive maintenance in AC plant?

a. Reduce water flow
b. Increase running cost
c. Prevent plant s break down
d. Decrease refrigerant charge

14. What is the method of flushing the indoor coils?

a. Using nitrogen
b. Pressurised air
c. Chemical cleaning
d. Mechanical cleaning

15. What is the purpose of the screw marked as x in LP control?



a. Adjust low pressure
b. Differential adjustment
c. Temperature adjustment
d. Adjust discharge pressure

16. Why the temperatures of inlet and outlet water in shell and tube condenser are recorded in log sheet?

a. Study about the plant
b. Judge quality of water
c. Checking the hardness of water
d. Fix descaling time for condenser

17. Which parameter of power supply reduces the starting current in VFD motor?

a. Decreased power factor
b. Increased supply voltage
c. Lower frequency operation
d. Decreased resistance mode

18. Why the U trap is provided in water drain line of AHU?

a. Allows air from outside
b. Block dust from outside
c. Prevent entry of foul smell
d. Ensure free flow of drain water

19. What is the benefit of VRV system?

a. Bigger in size b. Many controls c. Energy saving d. Saving refrigerant

20. Which type of AC system is capable of heating or cooling in different zones simultaneously?

a. Package AC b. Central plant AC c. VRV AC system d. VAV AC system

21. Which distribution system is absent in VRV operation compared to central AC plant?

a. Refrigeration b. Ducting system c. Refrigerant flow d. Interlocked wiring

22. Which version of motors are used in ductless multisplit system?

a. Bioptional drive
b. Trioptional drive
c. Variable frequency drive
d. Constant frequency drive

23. Which refrigerant is used with VRF AC system?

a. R 11 b. R 12 c. R 502 d. R 410A

24. How the indoor unit acts during heating cycle of heat pump?

a. Condenser b. Evaporator c. Expansion device d. Electrical heater

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

a. Flush oil particles
b. Charge refrigerant
c. Remove refrigerant
d. Remove moisture and non-condensable

26. Which process is done to remove the oil and other impurities from the condenser tubes?

a. Purging b. Flushing c. Evacuation d. Pressurising

27. Which valve is first closed to start the pump down operation in central AC plant?
    a. Receiver inlet valve
    b. Receiver outlet valve
    c. Suction service valve
    d. Discharge service valve
28. Which valve is used to release the non condensable gases from AC plant?

    a. Purge valve b Check valve c Service valve d. Solenoid valve

29. What is the reason for short cycling of LP control switch in AC plant?
    a. Excess of water flow
    b. Excess of refrigerant
    c. Shortage of water flow
    d. Shortage of refrigerant
30. Which parameters in log sheet indicate the air blocking in ducts?
    a. All grille temperatures
    b. Liquid line temperature
    c. Inlet and outlet temperature of chillier
    d. Temperatures in chilled water system
31. What is the effect on system performance if the AC system is at undercharged condition?
    a. Poor cooling
    b. Excess cooling
    c. Compressor over loading
    d. Compressor trips by HP cut out
32. What is the cause of oil foaming in compressor crankcase at the time of starting?
    a. Poor condensation
    b. Damaged oil separator
    c. Excess oil in crankcase
    d. Defective oil heater/circuit
33. Why the LP cut out control is bypassed electrically before pump down operation?
    a. Avoid oil foaming
    b. Prevent liquid entry to compressor
    c. Increase current of the compressor motor
    d. To lower the suction pressure close to 0.5

Answer: **DIRECT EXPANSION AIR CONDITIONING**

1:	b	12:	d	23:	d
2:	b	13:	c	24:	a
3:	d	14:	a	25:	d
4:	d	15:	b	26:	b
5:	c	16:	d	27:	b
6:	c	17:	c	28:	a
7:	d	18:	c	29:	d
8:	a	19:	c	30:	a
9:	d	20:	c	31:	a
10:	b	21:	b	32:	d
11:	b	22:	c	33:	d

CHILLER SYSTEM

1. Which type of pump is used in AC plants for circulation of chilled water?

   a. Gear b. Screw c. Rotary d. Centrifugal

2. Which secondary refrigerant is used for human comfort in chiller plant AC?

   a. Brine b. Water c. Ammonia d. Ethylene glycol

3. What is meant by hydronic system?

   a. Pressure equaliser
   b. Humidity control system
   c. Pressure control system
   d. Water distribution system in HVAC

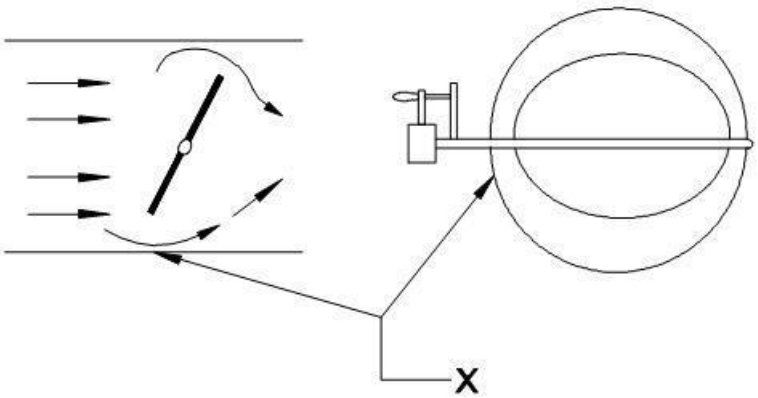
4. Which device is used to measure the density of brine solution?

   a. Lactometer b. Hydrometer c. Hygrometer d. Thermometer

5. What is the pH level of water used for final rinsing of condenser tubes after descaling?

   a. 4 to 4.5 b. 7 to 7.5 c. 10 to 12 d. 9 to 10.5

6. What is the name of device marked as x ?

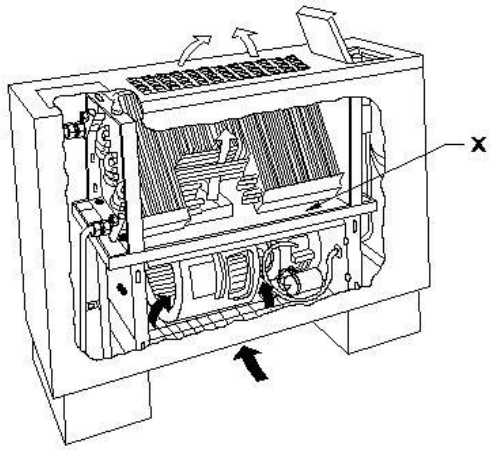


   a. Diffuser grille
   b. Splitter damper
   c. Butterfly damper
   d. Multiple vane damper

7. What is the formula for finding cooling tower efficiency?

   a. $\frac{Range + Approach}{Range} \times 100$
   b. $\frac{Range + Approch}{Range - Approach} \times 100$
   c. $\frac{Range}{Range + Approach} \times 100$
   d. $\frac{Range}{Range + Approach} + 100$

8. What is the name of part marked as X in fan coil unit?



a. Coil b. Heater c. Fan motor d. Drain pan

9. What is meant by static pressure?
   a. Moving air pressure
   b. Ambient air pressure
   c. Air diffusing pressure
   d. Still air pressure in duct
10. What is the name of part marked as x in the fan motor compartment?

a. Belt guard b. Drive Belt c. Motor Shaft d. Blower Cover

11. How the total heat of air is represented in psychrometric chart?

a. Entropy b. Enthalpy c. Latent heat d. Sensible heat

12. Which type of heat is considered for tube light s heat gain in AC space?

a. Latent heat b. Conduction heat c. Specific heat d. Sensible heat

13. Which thickness of PUF has the least thermal conductivity?

a. One inch b. Two inch c. Four inch d. Three inch

14. Which types of heat are involved in ventilation and infiltration of air to AC space?
   a. Sensible heat and solar heat
   b. Sensible heat and latent heat
   c. Radiant heat and specific heat
   d. Latent heat of water-vapour only
15. Which design data is used for indoor air heating in winter air conditioning?
   a. 20°C ± 1°C and RH = 35%
   b. 18°C ± 1°C and RH = 45%
   c. 16°C ± 1°C and RH = 50%
   d. 14°C ± 1°C and RH = 55%
16. Which branch of science deals with the properties of air?

a. Geometry b. Audiometry c. Psychometry d. Trigonometry

17. Which component protects the electrical circuit and loads from excess current?

a. Fuse b. Relay c. Relief valve d. Transformer

18. Which type of starter is used for motors in chiller AC plants?

a. Magnetic b. Hydraulic c. Pneumatic d. Electromagnetic

19. Which type of cooling tower is used in large capacity chiller plants?

a. Natural draft b. Forced draft c. Induced draft d. Liquid cooling

20. Which valve is used in capacity control system employing hot gas bypass?

a. Relief valve b. Safety valve c. Solenoid valve d. Reversing valve

21. Which material is used for making air ducts in chiller AC plant?

a. Cast iron b. Glass wool c. Thermo Cole d. Galvanised iron

22. Which expansion device is used with VFD motors in multi split AC?

a. Electronic b. Automatic c. Thermostatic d. Hand operated

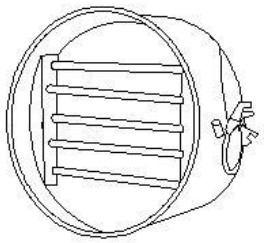
23. Which type of expansion device is used in flooded chillers?

a. Float valve
b. Multiple capillary
c. Automatic expansion valve
d. Hand operated expansion valve

24. Which type of heat is absorbed by water while passing through the cooling coils of an indirect expansion chiller plant?

a. Super heat b. Latent heat c. Specific heat d. Sensible heat

25. What is the name of component used in air distribution system?



a. Duct
b. Diffuser
c. Multi blade damper
d. Single blade damper

26. Which tool is used to straighten the deformed fins of air cooled condenser?

a. Blower b. Fin comb c. Wire brush d. Brass brush

27. Which refrigerant spreads the pungent odour if it leaks from ice plant system?

a. H_2O b. SO_2 c. CO_2 d. NH_3

28. Which device ensures correct flow of chilled water supply in chiller AC plant?

a. Sight glass
b. Leaf switch
c. Level master control
d. Pressure relief valve

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

a. LP cut out
b. HP cut out
c. Thermostat
d. Oil pressure cut out

30. How the pH of water is checked for acidic or alkaline?

a. By hydro meter
b. By hygro meter
c. Using litmus paper
d. Pressure relief valve

31. What is the advantage of glass fibre ducting?

a. Economical b. Heavy weight c. Self insulating d. High heat transfer

32. What parameters are checked if the uneven cooling prevails at different rooms in a chiller plant?

a. Compressor current drawn
b. Condenser water pump ampere
c. Cooling tower fan motor ampere
d. Chilled water pump current drawn

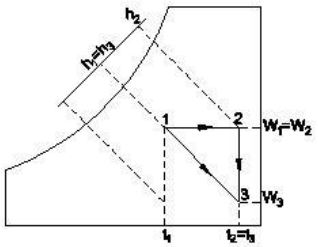
33. Which method prevents the foul smell of drainage entering the AHU?

a. Strainer b. U – trap c. Louvers d. Exhaust fan

34. What is the purpose of rinsing the condenser tubes with water after descaling process in industrial AC plant?

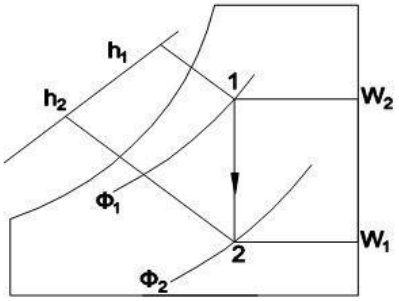
a. Remove algae
b. Remove scales
c. Check block in tubes
d. Remove acid particles

35. Which psychrometric processes are represented between initial (t1) and final (t2) conditions of air in the chart?



a. Cooling and humidification
b. Heating and humidification
c. Cooling and dehumidification
d. Heating and dehumidification

36. Which process is indicated between 1 and 2 by the arrow mark at constant dry bulb temperature?



a. Cooling
b. Heating
c. Humidification
d. Dehumidification

37. What is the capacity of air conditioner if it removes 18000 BTU/hr heat from the space?

a. 1.00 T.R
b. 1.25 T.R
c. 1.50 T.R
d. 2.00 T.R

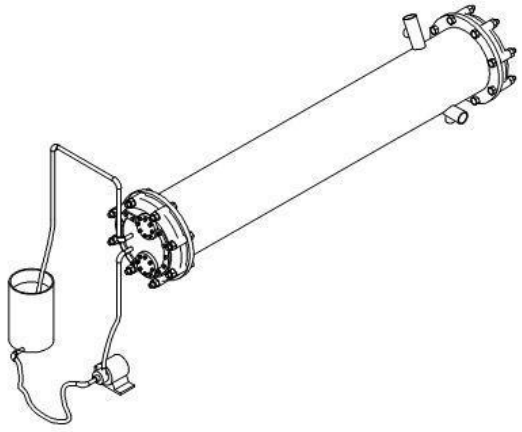
38. How much heat is released from 2 HP motor if 746 W motor releases 3 K Cal/hr?

a. 3 K Cal/hr
b. 4 K Cal/hr
c. 5 K Cal/hr
d. 6 K Cal/hr

39. What is the advantage of electrically interlocked circuit for motors and pumps in a chiller plant?

a. Start the loads non sequentially
b. Start the loads when not needed
c. Stop the loads when not required
d. Start and stop the loads sequentially

40. What service operation is in progress with shell and tube condenser?



a. Measuring quantity of water
b. Checking resistance of tubes
c. Decaling of condenser tubes
d. Removing tubes from condenser

41. Which parameter indicates that the central AC system has non condensable gas?

a. Liquid line temperature
b. Pressure drop in discharge line
c. Condenser inlet water temperature
d. Condenser outlet water temperature

42. What is the advantage of air washer compared to cooling coil of AHU?

a. Faster heat transfer
b. Quick dehumidification
c. No eliminators are required
d. Can be used in small systems

43. What is the advantage of variable speed pumping load control in chiller AC plant?

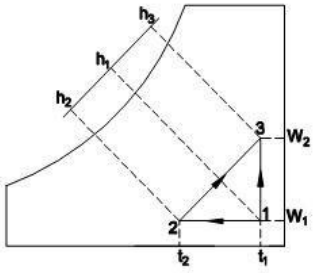
a. Heating control is easy
b. High cost of maintenance
c. Control valves are eliminated
d. Cooling coil can be eliminated

44. What is the purpose of using rubber pads while installing compressor?

a. Fill gaps
c. Locate the parts

b. Prevent leaks
d. Absorb vibration

45. What is the advantage of using indirect expansion chiller AC system?
    a. Quick cooling
    b. Cooling tower is not needed
    c. Less quantity of primary refrigerant
    d. Less quantity of secondary refrigerant
46. What is the purpose of gland packing in water line valves of chiller AC plant?
    a. Prevent leakage
    b. Control water flow
    c. Reduce valve noise
    d. Smooth handling of valve
47. What is the purpose of valves in chiller AC plants?
    a. Removes dust
    b. Control air flow
    c. Increase pressure
    d. Regulate the flow of water
48. What is the cause of water hammer or valve chatter in water pump lines?
    a. Low pump pressure
    b. Blocked suction line
    c. High pump pressure
    d. Low velocity of water
49. What is the cause of bubbles in liquid line sight glass after gas charging the system?
    a. Excess refrigerant
    b. Shortage of refrigerant
    c. Oil bubbles in sight glass
    d. Nitrogen trapped in system
50. What is the effect if the refrigeration system is started before chilled water pump?
    a. No cooling
    b. Water warms in chillier
    c. Water freezes in chillier
    d. Excess of heat transfer
51. Which control trips if the expansion valve inlet strainer is blocked in chiller AC plant?
    a. Thermostat control
    b. Low pressure cut out
    c. Oil pressure cut out
    d. High pressure cut out
52. What is the effect of improper alignment of machines while installing a central AC plant?
    a. Silent operation
    b. Excess of wear and tear
    c. Less noise and vibration
    d. Less power consumption
53. What is the remedy for no lubrication even if the sight glass shows proper oil level?
    a. Replace oil pump
    b. Add oil to crankcase
    c. Replace oil pressure gauge
    d. Replace oil pressure cut out
54. How the brine freezing on cooling coil is prevented in ice plant?
    a. Add water to brine
    b. Add glycol to brine
    c. Reduce concentration
    d. Increase salt concentration
55. What is the cause of discolouration of oil in a compressor?
    a. Moisture in oil
    b. Dirty drier filter
    c. Low pressure of oil
    d. Liquid refrigerant in oil
56. What is the effect if the oil return from oil separator to the compressor is blocked?
    a. Suction pressure rises
    b. Discharge pressure decreases
    c. Compressor oil level falls down
    d. Compressor oil level increases
57. What is the cause of compressor knocking sound in chiller AC plant?
    a. High oil level
    b. Liquid refrigerant entry
    c. Shortage of refrigerant
    d. Air entered into system
58. Which causes the filter drier to become cold in chiller AC plant?
    a. Over charge
    b. Under charge
    c. High condensing pressure
    d. Partial blocking of filter drier
59. What is the reason for low discharge line temperature in chiller AC?
    a. Excess refrigerant
    b. High evaporator load
    c. Insufficient refrigerant
    d. Condenser water pump not working
60. What is the cause of high condensing pressure in water cooled condenser?
    a. Lack of lubrication
    b. Damage condenser fan
    c. Low load on evaporator
    d. Defective cooling water pump
61. What is the reason for high condensing pressure in air cooled condensers?
    a. Dirt on fins
    b. Faulty water pump
    c. High speed of fan motor
    d. Low ambient temperature
62. Which psychrometric processes are represented between initial (t1) and final (t2) conditions of air in the chart?



a. Cooling and humidification
b. Heating and humidification
c. Heating and dehumidification
d. Cooling and dehumidification

Answers: **CHILLER SYSTEM**

1:	d	16:	c	31:	c	46:	a	61:	a
2:	b	17:	a	32:	d	47:	d	62:	a
3:	d	18:	d	33:	b	48:	c		
4:	b	19:	c	34:	d	49:	b		
5:	b	20:	c	35:	d	50:	c		
6:	c	21:	d	36:	d	51:	b		
7:	c	22:	a	37:	c	52:	b		
8:	d	23:	a	38:	d	53:	a		
9:	d	24:	d	39:	d	54:	d		
10:	a	25:	c	40:	c	55:	a		
11:	b	26:	b	41:	d	56:	c		
12:	d	27:	d	42:	a	57:	b		
13:	c	28:	b	43:	c	58:	d		
14:	b	29:	a	44:	d	59:	c		
15:	a	30:	c	45:	c	60:	d		

MOBILE AIR CONDITIONING

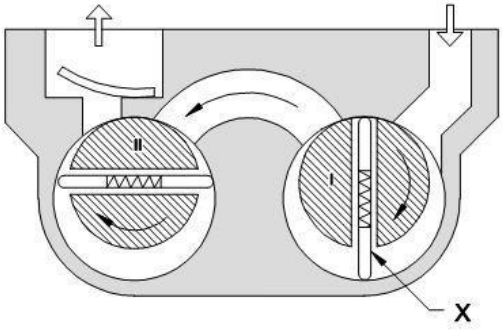
1. What is the minimum cross sectional area of the ducts used with bus AC?

a. 400 cm^2 b. 500 cm^2 c. 600 cm^2 d. 700 cm^2

2. How many water drain lines are provided for each evaporator in a bus AC?

a. One b. Two c. Three d. Four

3. What is the name of part marked x in the vacuum pump?



a. Rotor b. Housing c. Sliding vane d. Discharge valve

4. What is the equivalent of 760mm of Hg in torr?

a. 7.6 Torr b. 76 Torr c. 760 Torr d. 7600 Torr

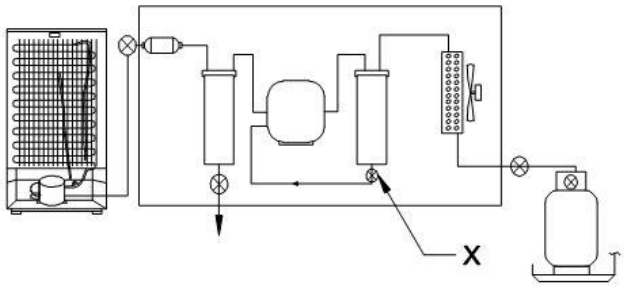
5. What is the comfortable range of relative humidity (RH) for human beings?

a. 30 ± 5% b. 40 ± 5% c. 50 ± 5% d. 60 ± 5%

6. Which type of filter drier is used with HFC 134a car AC?

a. XH – 1 b. XH – 3 c. XH – 5 d. XH – 7

7. What is the name of component marked X as in recycling machine?

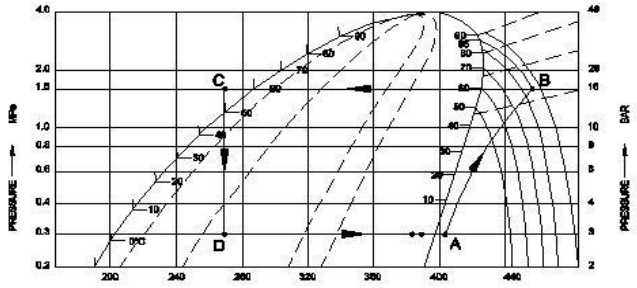


a. Pressure relief valve
b. Schrader valve
c. Oil return valve
d. Piercing valve

8. What is the human body temperature in °C?

a. 17°C b. 27°C c. 37°C d. 47°C

9. Which process of vapour compression system is represented along C→D in pH chart?



a. Expansion b. Evaporation c. Compression d. Condensation

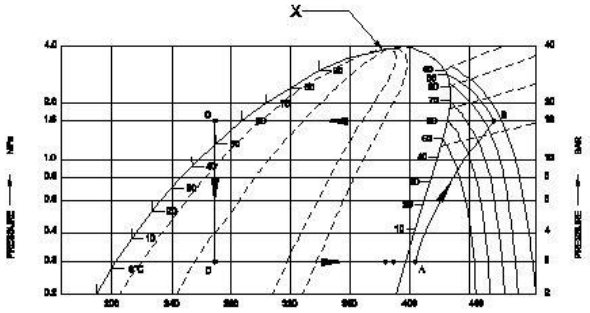
10. What is the temperature of air at the supply grille in car AC system at an ambient 35°C?

a. 10.2°C b. 11.3°C c. 12.4°C d. 13.5°C

11. What is low side pressure range in HFC134a car AC at an ambient range of 32°C to 35°C?

a. 1 kg/cm^2 - 3 kg/cm^2
b. 2 kg/cm^2 - 4 kg/cm^2
c. 3 kg/cm^2 - 5 kg/cm^2
d. 4 kg/cm^2 - 6 kg/cm^2

12. What is the name of curve marked as x in pressure - enthalpy chart of a refrigerant?



a. Saturated liquid
b. Saturated vapour
c. Critical temperature
d. Liquid vapour mixture

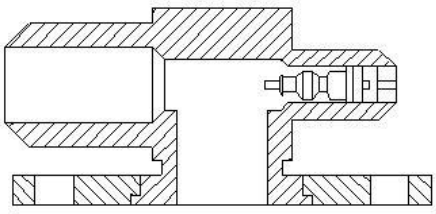
13. What is the boiling point of HFC-134a refrigerant at atmospheric pressure?

a. -26.1°C b. -25.6°C c. -24.5°C d. -23.6°C

14. What is the name of device used for gas charging in car AC system?

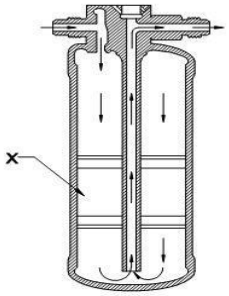
a. Schrader valve connectors
b. Non-return valve connectors
c. CFC - 12 service port assembly
d. HFC - 134a service port couplings

15. What is the name of component?



a. Schrader valve
b. Suction service valve
c. Receiver shut of valve
d. Discharge service valve

16. What is the name of part marked as x in receiver-drier used in automobile air-conditioner?



a. Desiccant
b. Filter pads
c. Pick-up tube
d. Liquid refrigerant

17. Which lubricant oil is used with R-134a car AC system?
a. Mineral oil
b. Low viscosity oil
c. High viscosity oil
d. Poly alkaline glycol

18. Where the sensor bulb of Thermostatic Expansion Valve is clamped?
a. Liquid Line
b. Suction Line
c. Discharge Line
d. Inside the compressor

19. Which type of short cycling is avoided by the design of blower housing in car AC?

a. Oil
b. Air
c. Moisture
d. Lubricant

20. Which operating condition opens the HPC control switch in car AC?
a. If evaporator pressure exceeds safe limit
b. If there is continuous rain outside
c. If condenser pressure exceeds safe limit
d. If there is continuous air velocity

21. What is the differential of low pressure cut out control switch? If LPC cuts out at 2.2kg/cm2 and LPC cut in at 2.4kg/cm2

a. 0.8 kg/ cm2
b. 0.4 kg/ cm2
c. 0.2 kg/ cm2
d. 0.1 kg/ cm2

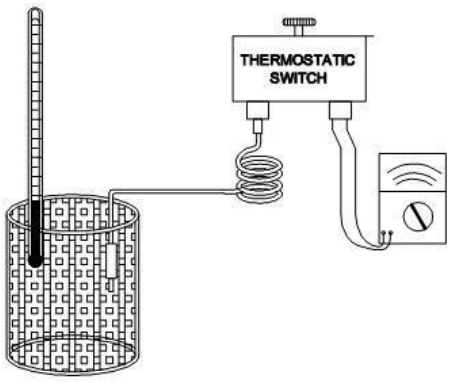
22. What is the absolute pressure of gas cylinder if the gauge reads 15.3 p.s.i.g?

a. 10 p.s.i.a
b. 20 p.s.i.a
c. 30 p.s.i.a
d. 40 p.s.i.a

23. Which size service port is used in automobile air conditioners for HFC-134a refrigerant?

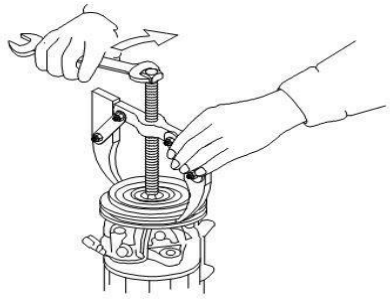
a. ¼ " - 13 ACME
b. ½ " - 16 ACME
c. 3/8 " - 15 ACME
d. 5/16 " - 14 ACME

24. What is tested by the multimeter on thermostatic switch?



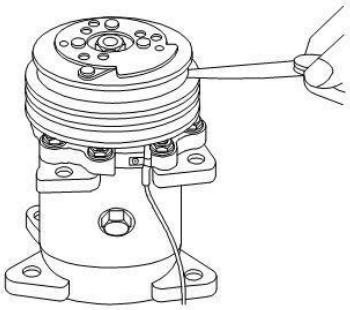
a. Grounded/shorted thermostat
b. Refrigerant leakage of bellow |
c. Working of knob in thermostat
d. Cut-in and cut-out function of thermostatf2

25. Which operation is carried out on pulley?



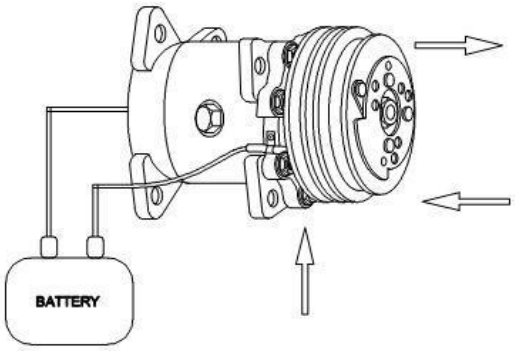
a. Pulling b. Pushing c. Aligning d. Tightening

26. What is being tested between the compressor drive pulley and the function plate in a car air-conditioner?



a. Clutch clearance using a blade
b. Clutch clearance using a knife
c. Clutch clearance using a feeler gauge
d. Clutch clearance using a screw driver

27. What is tested by 12V DC battery on compressor used in automobile air conditioner?



a. Working of compressor
b. Working of magnetic clutch
c. Testing of mounting clearance
d. Testing of compressor mounting

28. Why the service port fitting size differs in HFC-134a from CFC-12 car AC system?
a. Increases quantity of refrigerant charge
b. Decreases quantity of refrigerant charge
c. Avoids cross contamination of refrigerants
d. Improves performance of car air conditioners

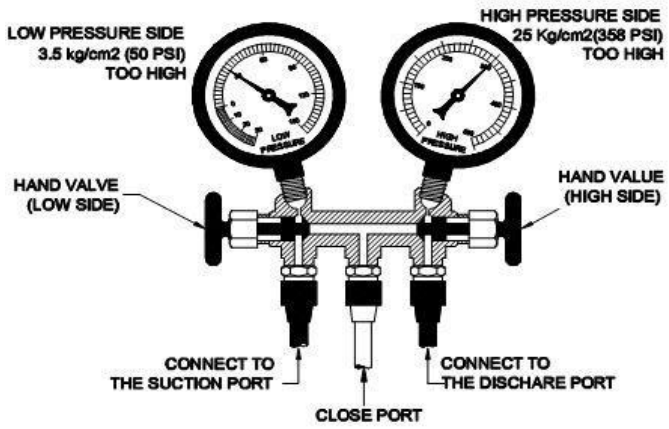
29. What is the advantage of recycling R 134a refrigerant?
a. Minimise air pollution
b. Reduce global warming
c. Increase water pollution
d. Increase ozone depletion

30. Which controls the speed of blower fan motor to vary air cooling or heating in car AC?
a. Selector switch and resistors
b. Thermostat and return-air sensor
c. Ambient and cabinet temperature
d. Increase or decrease refrigerant flow

31. Why the miscibility of refrigerant and oil is preferred in car AC?
a. Lubricate the clutch assembly
b. Lubricate the heat exchangers
c. Circulate oil back to compressor
d. Lubricate the moving parts of TEV

32. What are the controls connected in series with the magnetic clutch of compressor in car AC?
a. Thermostat, LPC, HPC
b. LPC, Blower Fan Motor
c. HPC, Condenser Fan Motor
d. Thermostat, Condenser Fan Motor

33. What is the function of magnetic clutch in an automobile air conditioner?
    a. Check Rpm of engine shaft
    b. Check Rpm of compressor shaft
    c. Start and stop the evaporator blower
    d. Start and stop the compressor electro magnetically
34. What are the three pressure actuated electrical control switches connected in series in an automobile air-conditioner?
    a. LPC, HPC and Blower-switch
    b. Thermostat, Electromagnetic clutch, on-off control
    c. Thermostat, Thermostatic expansion valve, Blower-switch
    d. Thermostat, Low-pressure control and high pressure control
35. What is the reason for water dripping inside the AC bus?
    a. Drain pan is leak proof
    b. Leakage of evaporator coil
    c. Poor insulation at the bottom of drain pan
    d. Worn out shock absorbers on the bus wheels
36. What is the effect of sludge in car AC?
    a. Chokes the orifice of TEV
    b. Blocks the orifice of AEV
    c. Closes the orifice of TEEV
    d. Closes the orifice of capillary
37. What is the reason for intermittent cooling cycle in car AC?
    a. Moisture in the system
    b. Fully evacuated system
    c. Excess of lubricant in receiver
    d. Non condensable in the system
38. What is the reason for having 2.5 kg/cm2 on low and high side of car AC system?
    a. Defective thermostat
    b. Excessive oil in evaporator
    c. Too close differential in LPC
    d. Defective compressor valve
39. Why both the gauges read abnormal high pressures while testing the car AC performance?



    a. Poor pumping
    b. Oxygen in system
    c. Nitrogen in system
    d. Excessive refrigerant charge
40. What is the cause of bubbles in liquid line at sight glass in car AC system?
    a. No refrigerant charge
    b. Over charge of refrigerant
    c. Shortage of refrigerant
    d. Correct charge of refrigerant

Answer: **MOBILE AIR CONDITIONING**

1:	c	11:	A	21:	c	31:	c
2:	b	12:	A	22:	c	32:	a
3:	c	13:	A	23:	b	33:	d
4:	c	14:	D	24:	d	34:	d
5:	c	15:	A	25:	a	35:	c
6:	d	16:	A	26:	c	36:	A
7:	c	17:	D	27:	b	37:	A
8:	c	18:	B	28:	c	38:	D
9:	a	19:	B	29:	b	39:	D
10:	c	20:	C	30:	a	40:	B

ICE PLANT

1.which of the following method is used by small retail trucks for the delivery of ice-cream?

(a)using water ice

(b)using liquid nitrogen

(c)using water

(d) using dry ice

2. What should the ambient temperature around ice cube machine?

(a)0^0C-10^0C (b)10^0C-25^0C c.10^0-43^0C d.2.8^0-78^0C

3.What is the ambient temperature around ice cube machine?

a. Ice port b. ice bin c. ice box d. all of these

4. Which of the following refrigerant commonly used in commercial ice plant?

a. carbon dioxide b. air c. ammonia d.freon-12

5.The main part used in an ice candy machine for freezing the candy is_____

a.ice port b.ice bin c. ice cane d. none of these

6.The capacity of direct cooling type evaporator is_____

a.1/6HP b.1/4HP c.3/8HP d.all of these

7.Brine is a _____refrigerant.

a. Primary b. secondary c. tertiary d. all of these

8.What is the freezing point of brine solution?

a. More than 0^0C b.5^0C c10^0C D. less than 0^0C

9.Following is an example of brine solution?

a.NaCl b.KCl c.PCl d.NaOH

10.This component is not used in an ice cream plant_

a. homogenizer b. pasteurizer c. heat exchanger d. ice bin

11.In which of the following the brine is always used as a secondary refrigerant_

a. Milk chilling plant b. ice plant c. cold storage d. none of these

12.In an ice plant, the function of brine aviator is_____

a. To increase COP b.to reduce compressor power c. To obtain uniform temperature d. none of these

13. During which process air is mixed in the ice cream mixture?

a. Freezing b. ageing c. Pasteurization homogenization

14.What temperature is maintained for 15 seconds during pasteurization?

a.30^0C b.45^0C c.72^0C d.105^0C

15. What type of heat exchanger is mostly used in ice cream plants?

a. plate type b. shell type c. tube type d.fin type

16.The component used for breaking thick particles into small particles in an ice cream plants?

a. aging tank b. heat exchanger c. homogenizer d. freezing unit

17.The specific heat of a brine solution with 5%$CaCl_2$ concentration is_

a.4 b.3.8 c.3.5 d.3.3

18.what is the minimum temperature that can be obtained by NaCl brine?

a. -5^0c b.-10^0c c.-15^0c d.-21^0c

19.The dew point temperature of the room in which solidification of ice candy takes place is

a. Below 20^0C b. below 25^0c c. below 15^0c d.all of these

20.The machine used on a commercial level to convert water into ice cube is called

a. ice candy plant b. ice cream plant c. refrigeration system d. ice cube machine

21.Which of the following method is used by small retail trucks for the delivery of ice-cream?

a. using water ice b. using liquid nitrogen c. using water d. using dry ice

22.In the ice manufacturing, the ice cans are fabricated from_____

a. Aluminium b. galvanized steel with chromium treatment c. copper d. brass

23.The component used to mix and finely grind all the particles present in the mixture is_____

a. Pasteurise b. Homogenizer c. Heat exchanger d. compressor

24.What is the degree of temperature maintained by a refrigeration system for freezing?

a. -30^0C B.90^0C c.-25^0C d.75^0C

25.Where the ice cubes are in regular use?

a. Bars b. Restaurants c. Remote homes d. Residential flats

ANSWERS: **ICE PLANT**

1.d	6.d	11.b	16.c	21.d
2.c	7.b	12.c	17.b	22.b
3.b	8.d	13.a	18.d	23.b
4.c	9.a	14.c	19.c	24.c
5.c	10.d	15.a	20.d	25.a

WALK-IN-COOLER AND REACH-IN CABINET

CHOOSE THE CORRECT ANSWER

1. The unit used in walk-in cooler is _____

a. wall cell b. ceiling panel c. wall array d. wall panel

2. What is a wall panel made of?

a. conducting substanceb. semiconducting substance c. insulating substance d.all of these

3. The substance used in a panel is_____

a. aluminium b. galvanized steel c. vinyl d.all of these

4. This is helpful in controlling the temperature in a walk-in-cooler_____

a. light switch b. door valve c. thermostat d. porcelain

5. The insulating substance used in a walk-in-cooler is_____

a. polystyrene b. polyurethane c. foam d.all of these

6. The condenser in a walk-in-cooler is_____

a inside the unitb. above the unit c. Separate from the unit d. none of these

7. The other name for reach-in cabinet is _____

a. air tight cabinet b. high cooling cabinet c. water cabinet d. grocery cabinet

8. Following is the compact form of a walk-in-cooler_____

a. water cooler b. bottle cooler c. walk cabinet d .reach-in-cabinet

9. Following is a system that can be assembled on the site of installation_____

a. walk-in-cooler b. bottle cooler c. reach-in-cabinet d. walk cabinet

10. The advantage of an outdoor walk-in cooler is_____

A.it consume less power b.it has a high storage capacity

c.it doesn't require any other arrangement for the condenser fan

D.all of these

11. The disadvantage of an indoor walk-in-cooler is_____

a. they are expensive b. they have a complex construction

c. they heat up building d.all of these

12. The capacity of a walk-in-cooler is measured in_____

a. Cu/m^2 b.$Cu.m^2$ c. Cu.m d.Cu^2m

13.The temperature level of a walk-in-cooler is_____

a.-30^0C to -15^0C b.0^0C to 15^0C c.-2^0C to-13^0C d.-35^0C to 2^0C

14. Thickness of the insulation used in a walk-in-cooler is_____

a. almost 4 inches b. almost 10inches c. almost 15inches d.almost20inches

15.An application of reach in cabinet is_____

a.in the field of medicine b.in the industrial field c.in meat market d.in cold storage

Answers:- **WALK-IN-COOLER AND REACH-IN CABINET**

1.d	4.c	7.d	10.c	13.c
2.c	5.d	8.d	11.c	14.a
3.d	6c	9a	12.c	15.a