CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD
Technical and Vocational Education Examination

FUNDAMENTAL REFRIGERATION AND AIR CONDITIONING 1
5300

JUNE 2020 **INTERMEDIATE LEVEL**

Centre No. & Name	
Candidate No.	
Candidate Name	

Mobile phones are **NOT** allowed in the examination room.

5300 FUNDAMENTAL REFRIGERATION AND AIR CONDITIONING 1**: MULTIPLE CHOICE QUESTION PAPER**

1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed "**Intermediate Level – 5300** FUNDAMENTAL REFRIGERATION AND AIR CONDITIONING **1**.
4. Insert the information required in the spaces above.
5. Insert the information required in the spaces provided on the answer sheet using your HB pencil:

   Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number.

   Take care that you do not erase or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination:

6. Answer **ALL** the **50** questions in this Examination. All questions carry equal marks.
7. Each question has FOUR suggested answers: **A, B, C** and **D**. Decide which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.

   For example, if **C** is your correct answer, mark **C** as shown below:

   [A] [B] [C] [D]

8. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
9. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
10. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
11. **You must not take this booklet and the answer sheet out of the examination room. All question booklets and answer sheets will be collected at the end of the examination.**

1. Absorption system normally uses the following

A	Freon-11
B	Freon-22
C	CO2
D	Ammoniac

2. In a refrigeration cycle, the flow of refrigerant is order by

A	Compressor
B	Evaporator
C	Expansion valve
D	Condenser

3. The pressure at the inlet of a refrigerant compressor is called

A	Suction pressure
B	Discharge pressure
C	Liquid pressure
D	Average pressure

4. -In an absorption refrigeration cycle, the compressor of the vapor compression refrigeration cycle is replaced by

A	Liquid pump
B	Generator
C	Absorber and generator
D	Absorber, liquid pump and generator

5. In a vapor absorption refrigerator, heat is rejected in

A	Condenser only
B	Condenser and absorber
C	Generator only
D	Absorber only

6. In ideal refrigeration cycle, the condenser and evaporator temperature are 27°C and -13°C respectively. The COP of cycle is.

A	6,5
B	5,5
C	6
D	10

7. What is the perfect condition for dehumidification of air?

A	air is heated above its dew point temperature
B	air is cooled up to its dew point temperature
C	air is heated below its dew point temperature
D	air is cooled below its dew point temperature

8. When the rate of evaporation of water is zero, the relative humidity of the air is

A	0%
B	100%
C	50%
D	unpredictable

9. The dew point temperature is less than the wet bulb temperature for

A	saturated air
B	unsaturated air
C	both saturated and unsaturated air
D	all situation

10. At 100% relative humidity, the wet bulb temperature is

A	lower than the dew point temperature
B	Higher than the dew point temperature
C	Equal to the dew point temperature
D	Equal to the dry bulb temperature

11. Humidification is the process of addition moisture in air at

A	Constant wet bulb temperature
B	Constant dry bulb temperature
C	Constant latent heat
D	Constant dew point temperature

12. The horizontal line in psychrometric chart joining the change of state of air represents

A	a. humidification
B	sensible cooling or heating
C	sensible cooling or heating with humidification
D	sensible cooling or heating with dehumidification

13. The moisture content lines in psychrometric chart are also called as

A	Relative humidity lines
B	Specific humidity lines
C	Enthalpy lines.
D	Adiabatic lines

14. At any point on the saturation curve in psychometric chart, the dry bulb temperature is always

A	Less than the corresponding wet bulb temperature
B	More than the corresponding wet bulb temperature
C	Equal to the corresponding wet bulb temperature

D	Cannot predict

15. On psychrometric chart, wet bulb temperature lines are

A	Horizontal with uniformly spaced
B	Horizontal with non-uniformly spaced
C	Inclined with uniformly spaced
D	Inclined with non-uniformly spaced

16. When the dew point temperature is equal to the air temperature then the relative humidity is

A	0%
B	50%
C	100%
D	unpredictable

17. The temperature, at which the air cannot hold all the water vapor mixed in it and some vapor starts condensing, is called as

A	Humidification temperature
B	Dehumidification temperature
C	Dew point temperature
D	Wet bulb temperature

18. When the humidity ratio of air increases the air is said to be

A	Dehumidified
B	Humidified
C	Heated
D	Cooled

19. What is sensible cooling of air?

A	The cooling in which sensible heat of air is removed in order to reduce pressure
B	b. the cooling in which temperature of air is reduced with changing in its moisture content
C	b. the cooling in which temperature of air is reduced with changing in its moisture content
D	The cooling in which sensible heat of air is removed in order to reduce relative humidity

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20. Which temperature can be measured by an instrument called psychrometer?

A	Dry bulb temperature
B	Wet bulb pressure
C	Dry bulb pressure
D	Dew point pressure

21. The temperature of air recorded by thermometer when the bulb is covered by a cotton wick saturated by water is called as

A	Dry bulb temperature
B	Wet bulb temperature
C	Stream temperature
D	Psychrometric temperature

22. What is the temperature at which the water vapor in the mixture of water vapor in air, starts condensing called?

A	Condensation temperature
B	Dew point temperature
C	Vaporization temperature
D	Evaporation temperature

23. The degree of saturation varies between

A	1 to infinity
B	0 to infinity
C	0 to 1
D	1 to 10

24. What is the relative humidity for a saturated air?

A	0%
B	50%
C	100%
D	cannot say

25. In adiabatic evaporative cooling, heat transfer between room and surroundings is ____

A	Zero
B	High
C	Low
D	One

26. In vapor refrigeration cycle, which of the following is used for expansion?

A	a) expansion engine
B	b) throttling valve or capillary tube
C	Reciprocating compressor
D	Rolling compressor

27. Which of the following operations occur in a vapor refrigeration cycle?

A	Cooling and condensing
B	Expansion and dehumidification
C	Expansion and humidification
D	Cooling and humidification

28. In vapor refrigeration cycle, Compression can be
(a) dry compression
(b) wet compression

A	dry compression
B	throttling

C	fast compression
D	slow compression

29. The expansion process is

A	Isentropic
B	Reversible
C	Adiabatic
D	Isothermal

30. The evaporation process is a

A	Constant volume reversible process
B	Constant pressure reversible process
C	Adiabatic throttling process
D	Reversible adiabatic process

31. In the expansion process, which of the following remains constant?

A	Work done
B	Heat supplied
C	Internal energy
D	Enthalpy

32. Which of the following is recommended in a refrigeration cycle?

A	a) superheating of water
B	a) superheating of liquid
C	b) sub cooling of vapor
D	b) sub cooling of liquid

33. A condenser must ____ and then ____ the compressed refrigerant.

A	Superheat, evaporate
B	DE superheat, evaporate
C	Superheat, condense
D	DE superheat, condense

34. If the gas is cooled during compression, work required will be ____ the adiabatic compression work.

A	More than
B	Less than
C	Equal to
D	Double to

35. Which of the following is an advantage of cooling?

A	Less pipe friction losses
B	Increase in volume of gas
C	More pipe friction losses
D	Increase in pressure of gas

36. The adiabatic efficiency of real compressor can be ____

A	Less than unity
B	Greater than unity
C	Equal to unity
D	Equal to zero

37. The pressure at the inlet of a refrigerant compressor is called

A	Suction pressure
B	Discharge pressure
C	Evaporating pressure
D	Condensing pressure

38. In vapor compression cycle, the condition of refrigerant is saturated liquid

A	After passing through the condenser
B	Before passing through the condenser
C	After passing through the expansion throttle valve
D	Before entering the expansion valve

39. The vapor pressure of refrigerant should be

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

40. In parallel flow heat exchangers,

A	The exit temperature of hot fluid is always equal to the exit temperature of cold fluid
B	The exit temperature of hot fluid is always less than the exit temperature of cold fluid
C	The exit temperature of hot fluid is always more than the exit temperature of cold fluid
D	We cannot predict comparison between exit temperatures of hot fluid and cold fluid

41. In a vapor compression system, the condition of refrigerant before passing through the condenser is

A	Saturated liquid
B	Wet vapour
C	Dry saturated vapor
D	Superheated vapor

42. Which of the following temperature difference is safer than other to consider in designing of heat exchangers?

A	Arithmetic Mean Temperature Difference (ΔT_{am})
B	Analogic Mean Temperature Difference (AMTD)
C	Arithmetic and Analogic

D	Logarithmic Mean Temperature Difference (LMTD)

43. For the same inlet and exit temperatures of two fluids, the LMTD for counter flow is always

A	a. smaller than LMTD for parallel flow
B	b. greater than LMTD for parallel flow
C	c. same as LMTD for parallel flow
D	d. unpredictable

44. In isothermal compression, all work done on gas is transformed into

A	Heat added into system
B	Heat going out of system
C	Internal energy increase
D	Heat remove from the system

45. The work of compression is ____ the shaft work.

A	Positive of
B	Negative of
C	Equal to
D	Less than

46. The COP of cycle is given by(Q2=heat absorbed by evaporator and Wc=work done by compressor)

A	1- (Q2/Wc)
B	1- (Wc/Q2)
C	(Q2/Wc)
D	(Wc/Q2)

47. In the cooling and condensing, correct sequence of processes is

A	DE superheated->condensed->saturated liquid
B	DE superheated->saturated liquid->condensed
C	Condensed->DE superheated->saturated liquid
D	Saturated liquid->condensed->DE superheated

48. What is the specific humidity?

A	a. the ratio of the mass of water vapor to the mass of the total mixture of air and water vapor
B	b. the ratio of the mass of dry air to the mass of the total mixture of air and water vapor
C	c. the ratio of the mass of dry air to the mass of water vapor in a mixture of air and water vapor
D	d. the ratio of the mass of water vapor to the mass of dry air in a mixture of air and water vapor

9. When dry bulb temperature (DBT) and wet bulb temperature (WBT) are measured, greater the difference between DBT and WBT,

A	Greater the amount of water vapor held in the mixture
B	Smaller the amount of water vapor held in the mixture
C	Same the amount of water vapor held in the mixture
D	Smaller the amount of saturate vapor held in the mixture

50. The ratio of partial pressure of water vapor in a mixture to the saturation pressure of water at the same temperature of the mixture is called as

A	Humidity
B	Partial humidity
C	Specific humidity
D	Relative humidity