higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

REFRIGERATION PRINCIPLES
NQF LEVEL 2

17 November 2022

This marking guideline consists of 5 pages.

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QUESTION 1

1.1 1.1.1 A compressor takes refrigerant in the form of low-pressure vapour from the evaporator and compresses it to form high-pressure vapour. (2)

1.1.2 The refrigerant condenses to a liquid at constant pressure when heat is rejected. (1)

1.1.3 The controlled amount of refrigerant is released into the evaporator. (1)

1.1.4 The refrigerant in the evaporator absorbs heat by evaporating and enter the compressor as low-pressure vapour. (2)

1.2
- Compressor to condenser
- Evaporator to compressor (2)

1.3
1.3.1 True
1.3.2 True
1.3.3 True
1.3.4 False
1.3.5 False
1.3.6 False
1.3.7 True
1.3.8 False
1.3.9 True
1.3.10 True

(10 × 1) (10)
[18]

QUESTION 2

2.2

No	Component	SI Unit	Symbol
2.1.1	Frequency	Hertz	Hz
2.1.2	Electromotive force	Voltage	Volts
2.1.3	Power	Watts	W
2.1.4	Current	Ampere	A

(4 × 1) (4)

2.2 2.2.1 A very small atomic particle which carries a negative electrical charge.

2.2.2 The destruction of life by means of an electric current.

(2 × 2) (4)

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2.3 2.3.1

$$\frac{1}{Rt} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}$$

$$\frac{1}{Rt} = \frac{1}{10} + \frac{1}{13} + \frac{1}{20}$$

$$Rt = \frac{130}{29,5}$$

$$Rt = 4,407\ \Omega$$

2.3.2

$$P = I^2R$$

$$P = (2,3)^2 \times 4,407$$

$$P = 23,313\ W$$

(3 × 2) (6)

2.4 To prevent damage to equipment. (1)
[15]

QUESTION 3

3.1 3.1.1 Combination pliers. (1)

3.1.2
A Tip
B Pipe grip
C Cutter
D Pivot point or fulcrum
E Handle

(5 × 1) (5)

3.2 3.2.1 Flare too thin
3.2.2 Uneven flare
3.2.3 Flare slit

(3 × 1) (3)

3.3
- Blue – low-pressure side
- Yellow – service operation
- Red – high-pressure side

(2 × 3) (6)
[15]

QUESTION 4

4.1 4.1.1 C
4.1.2 A
4.1.3 D
4.1.4 E
4.1.5 B

(5 × 1) (5)

4.2 101.1 °C (1)

4.3
- Importation and exportation.
- Prohibition on venting of refrigerants.
- Regulatory requirements.
- Evacuation of equipment for recovery of refrigerant. (2 × 4) (8)

[14]

QUESTION 5

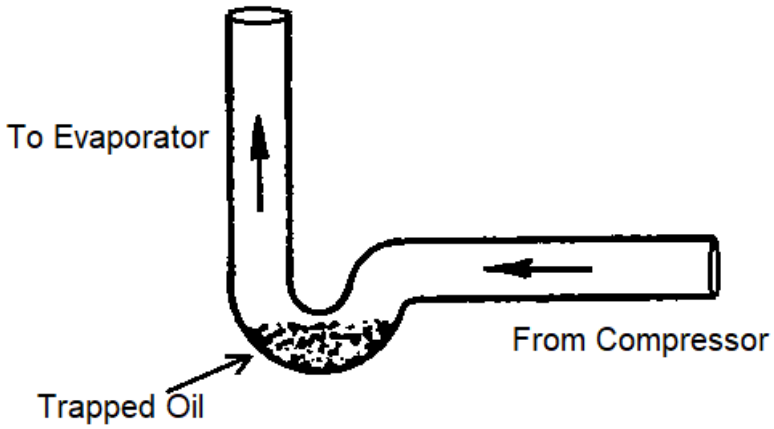
5.1
- Steel tubing
- Plastic piping
- Aluminium piping (3)

5.2 5.2.1 D
5.2.2 E
5.2.3 A
5.2.4 B
5.2.5 C

(5 × 1) (5)

5.3
- Flaring
- Swaging
- Soldering
- Brazing
- Threading (5)

5.4



(5)

[18]

QUESTION 6

6.1
- Hexagon screw
- Square
- Clutch
- Hex socket
- Phillips
- Torx (6)

6.2
6.2.1 Acorn nut
6.2.2 Wing nut
6.2.3 Nylock nut
6.2.4 Castle nut

(4 × 1) (4)
[10]

QUESTION 7

7.1 An increase in discharge pressure and temperature because the condenser fills up with liquid refrigerant. (2)

7.2
- Soap bubble
- Halide torch
- Electronic leak testing (3)

7.3
7.3.1 B.
7.3.2 D
7.3.3 A
7.3.4 C

(4 × 1) (4)
[10]

TOTAL: 100

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