higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

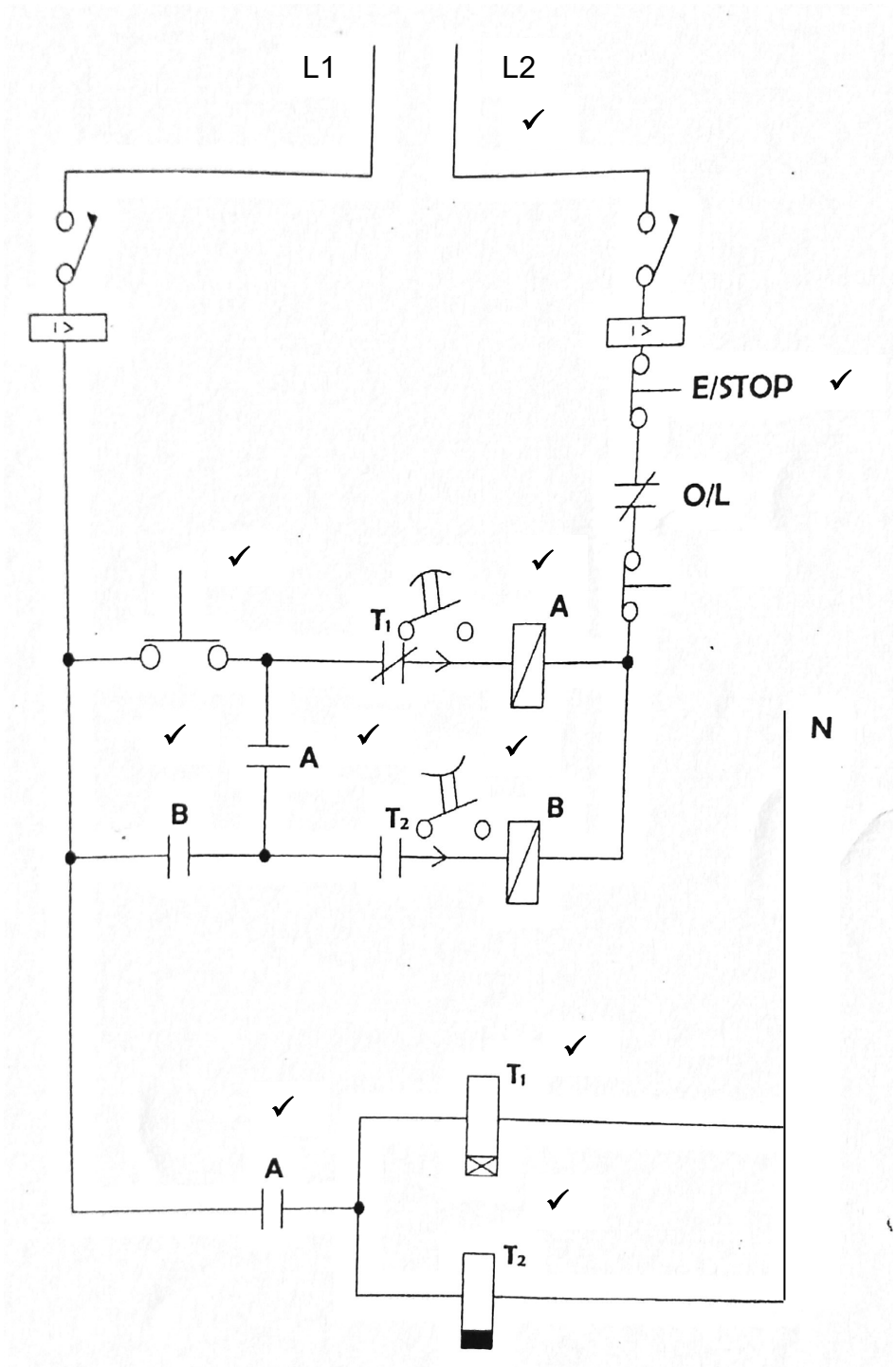
FAULT FINDING AND PROTECTIVE DEVICES N5

3 April 2020

This marking guideline consists of 7 pages.

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QUESTION 1



[10]

QUESTION 2

2.1 2.1.1 DC machine (1)

2.1.2 A – Pole shoe
B – Field coil or winding
C – Armature winding
D – Commutator
E – Brush
F – Armature (6)

2.2 2.2.1 Reversal of the EMF and current to the short-circuited coil during its transfer from one commutator segment to the next (2)

2.2.2 Angular distance between the centres of two adjacent poles (1)
[10]

QUESTION 3

3.1
- Stator
- Rotor
- End shields supporting the bearings (3)

3.2
- Rotor resistance needed at starting
- High starting torque
- Low starting current
- Winding wires used for rotor construction
- Maintained parts like slip ring and brush gears (Any 4 × 1) (4)

3.3
- Insulation resistance test between windings
- Insulation resistance test between each winding and earth
- Short-circuit and open-circuit test/Continuity test (3)
[10]

QUESTION 4

4.1
- To reduce friction
- To clean
- To cool
- No viscosity change with temperature change (4)

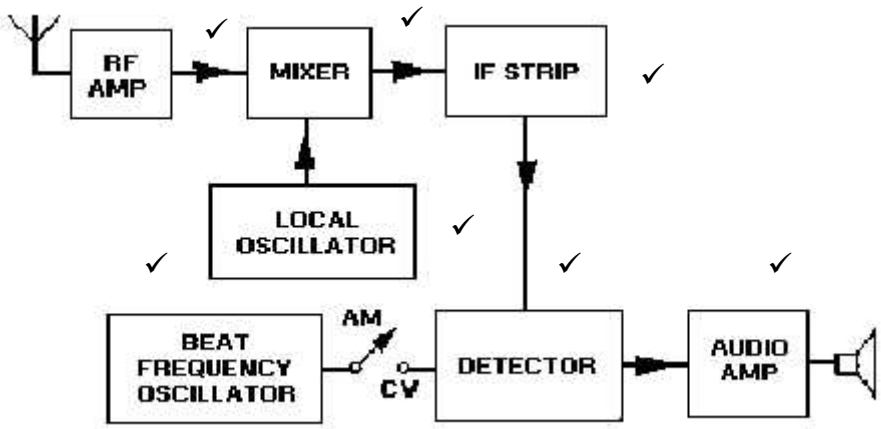
4.2 Low-voltage DC supply is connected✓ across brush pitch✓ to measure voltage drop across each adjustment segment✓ between the brush pitch✓ with a voltmeter.✓ Variation of 5% above or below the average reading is allowed.✓ (6)
[10]

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QUESTION 5

5.1
- Low harmony content
- Stable operating frequency
- Stable output amplitude
- Low spurious output like low noise, module distortion (Any 3 × 1) (3)

5.2



(7)
[10]

QUESTION 6

6.1 Used for determining the value or magnitude of a quantity or variable. (1)

6.2
- To measure AC and DC voltage
- To measure frequency
- To analyse waveforms
- To indicate phase difference between signals
- To indicate wave distortion (Any 4 × 1) (4)

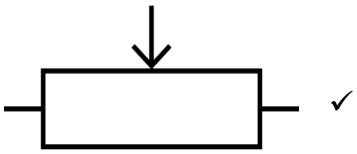
6.3 6.3.1 A sharply focused beam of electrons is produced and accelerated to a high velocity to strike the fluorescent screen with enough energy to light up in a small glow. (3)

6.3.2 It produces a trigger pulse at some selected point on the input waveform to start the time-base generator. (2)
[10]

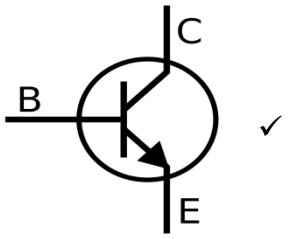
QUESTION 7

7.1 7.1.1 A Variable resistor/Adjustable resistor or potentiometer
B Transistor (2)

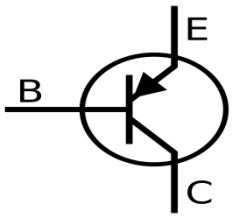
7.1.2 A



B



OR



(2 × 1) (2)

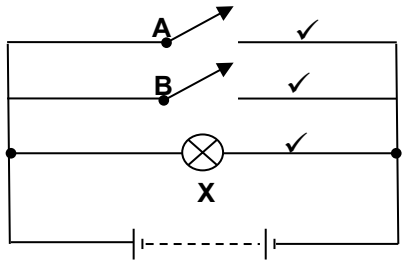
7.2
- Common base
- Common collector
- Common emitter (3)

7.3
- Devices controlling high power
- Devices controlling high voltage
- Car ignition systems
- Lamp dimmers
- Temperature regulators (Any relevant 3 × 1) (3)

[10]

QUESTION 8

8.1 8.1.1



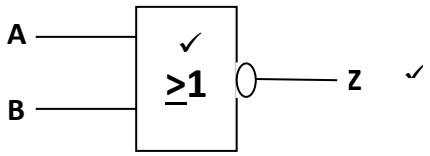
(3)

8.1.2 NOR gate (1)

8.1.3

A	B	Z
0	0	1
0	1	0
1	0	0
1	1	0

✓✓✓✓



(6)
[10]

QUESTION 9

9.1
- AND gate
- NOT gate
- NOR gate

(3)

9.2 9.2.1 D
9.2.2 A
9.2.3 B
9.2.4 A
9.2.5 C

(5 × 1) (5)

9.3
- R-S
- J-K
- T type
- N-type

(Any 2 × 1) (2)
[10]

QUESTION 10

10.1 0100 1010, 0110_2
10.2 011, 111_2
10.3 $76,25_{10}$
10.4 111, 01_2
10.5 $8A,2_{16}$

(5 × 2) **[10]**

TOTAL: 100

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