higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

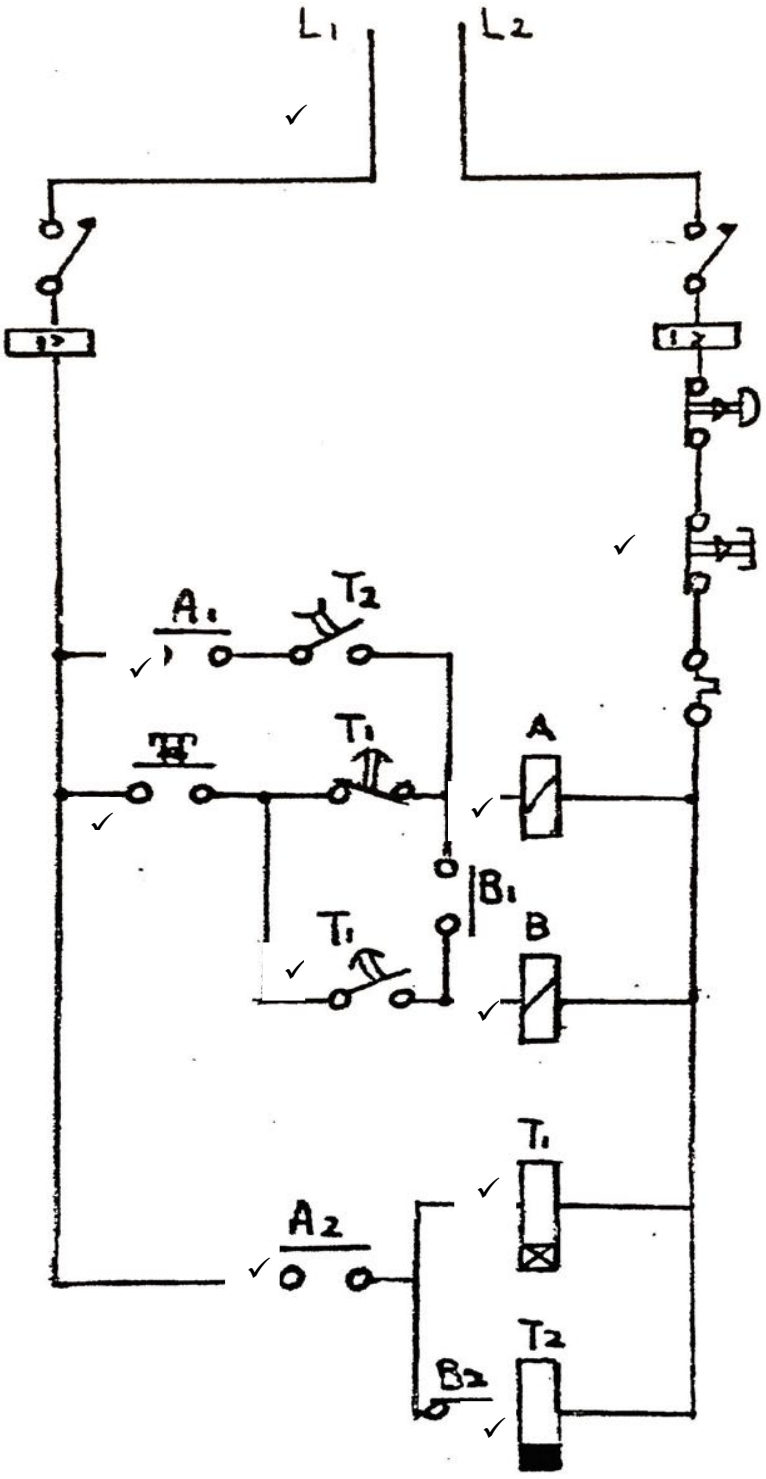
FAULT FINDING AND PROTECTIVE DEVICES N5

8 April 2021

This marking guideline consists of 7 pages.

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QUESTION 1



[10]

QUESTION 2

2.1
- Shifting brushes to magnetic neutral axis
- Increasing brush contact resistance
- Using interlopes
- Using compensating windings (4)

2.2 To decelerate motor before reversal of rotation (2)

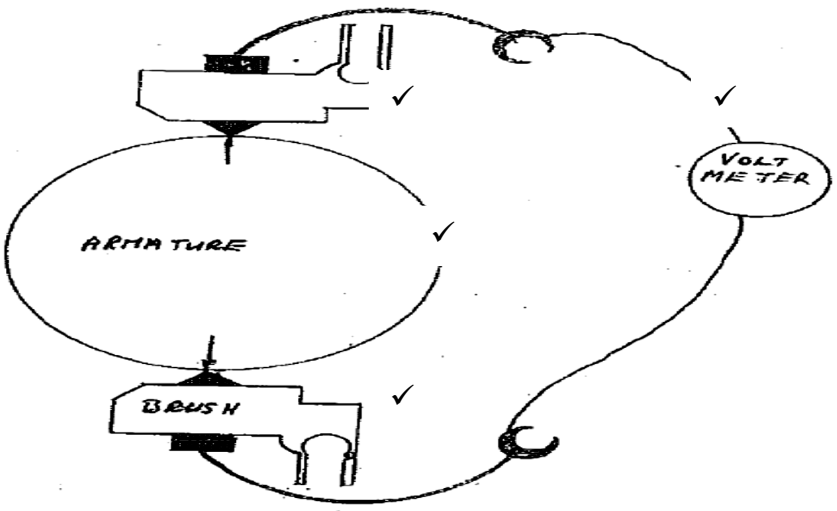
2.3 2.3.1
- To increase efficiency of magnetic path
- To distribute main magnetic flux evenly over air gap between stator and rotor
- To increase cross-sectional area reducing reluctance of air gap
- To hold field windings in position (Any ONE)

2.3.2
- Produces main magnetic flux
- Used for excitation to supply field flux

(2 × 2) (4)
[10]

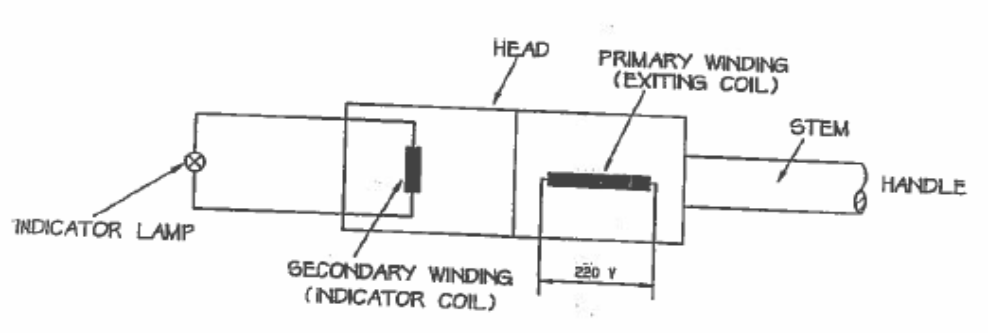
QUESTION 3

3.1



(1 × 1 for correct sketch) (5)

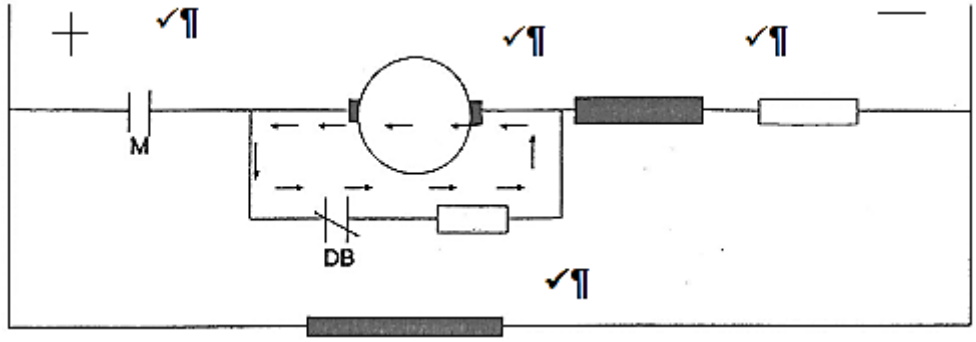
3.2

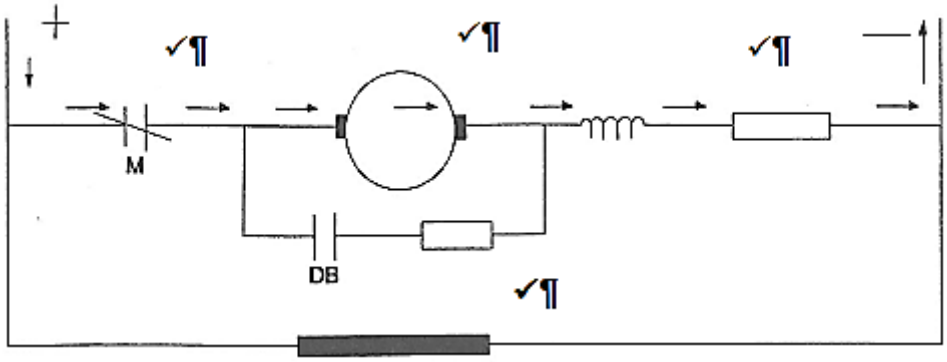


(Correct sketch 1 × 2 and labels 1 × 3) (5)
[10]

QUESTION 4

4.1





(8)

4.2 When motor is still running✓ or when armature is still starting✓ (2)
[10]

QUESTION 5

5.1
- Deflecting voltage
- Length of deflection path
- Distance from deflecting system to plates (3)

5.2 X-deflection plates deflect beam horizontally✓ and Y-deflection plates deflect beam vertically✓ (2)

5.3
- Ensure interruption of supply
- Verify that circuit is switched off
- Isolate circuit
- Ensure supply cannot be switched on accidentally
- Earth apparatus
- Lock out and place safety notices
- Isolate circuit (Any 5 × 1) (5)

[10]

QUESTION 6

6.1
- Selectable pen and carriage speed
- Built-in electronic time base
- Vacuum paper hold down
- Electric pen lift
- Zener reference supplies
- Double pen Y -style.
- Selectable balancing speed (Any 4 × 1) (4)

6.2
- Delivery of a permanent record on standard graph paper
- Eliminations of human errors
- Function like hysteretic loop
- Availability of self-checking by opposite direction retracting and plotting closed loop
- Ability to plot family of curves representing second independent variable. (Any 4 × 1) (4)

6.3 Self-balancing potentiometer used to control both pen carriage position on one axis and pen position on carriage on other axis (2)

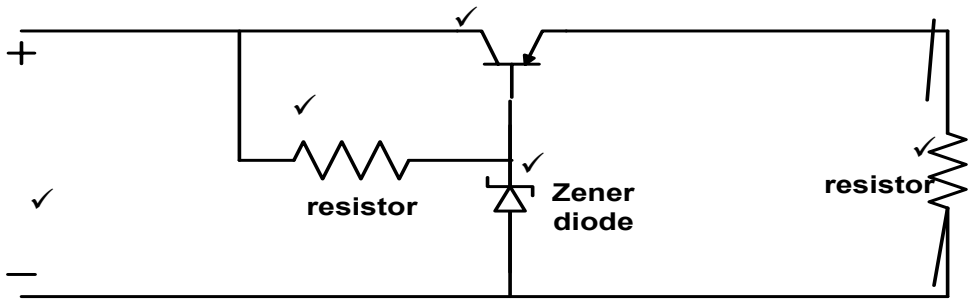
[10]

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QUESTION 7

7.1
- Stabilising gain
- Increasing input impedance and decreasing output
- Impedance
- Reducing noise and distortion
- Decreasing thermal effects
- Increasing operating bandwidth
- Achieving more linear operation (Any 5 × 1) (5)

7.2



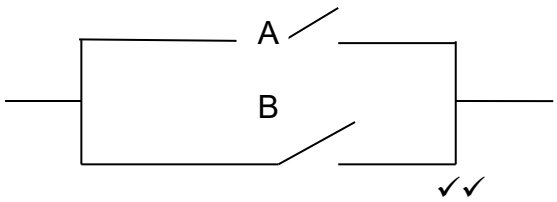
Positive Series Regulator (5)
[10]

QUESTION 8

8.1
8.1.1 True
8.1.2 False
8.1.3 True
8.1.4 False
8.1.5 True
(5 × 1) (5)

8.2
8.2.1 NOR gate
8.2.2 Exclusive OR gate
8.2.3 AND gate
(3 × 1) (3)

8.3

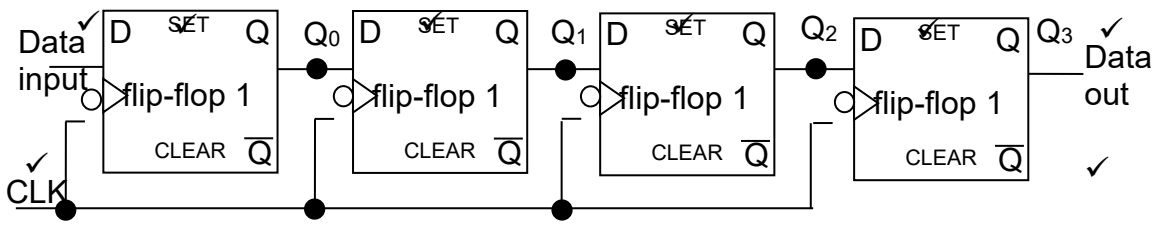


(2)
[10]

QUESTION 9

9.1 Group of J-K or D-type flip-flops connected in such a way that data is shifted in required side of register with every clock pulse (2)

9.2



(8)
[10]

QUESTION 10

10.1 527_{10}
10.2 $01010101,110_2$
10.3 $3BE,A_{16}$
10.4 147_8
10.5 100111001

(5 × 2) **[10]**

TOTAL: 100

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