Province of the
EASTERN CAPE
EDUCATION

DIRECTORATE SENIOR CURRICULUM MANAGEMENT (SEN-FET)

HOME SCHOOLING SELF-STUDY WORKSHEET ANSWER SHEET

SUBJECT	**POWER SYSTEMS**	**GRADE**	11	**DATE**	AUGUST 2020
TOPIC	CONTROL DEVICES	**TERM 1 REVISION**	()	**TERM 2 CONTENT**	(√)

ANSWERS TO QUESTIONS

1.

- Bearing failure
- Motor overheating
- Motor winding failure
- Reversing of rotation

2. It is a device or circuit that is able to control the performance of an electric motor.

3. Examples include: starting, stopping, controlling direction of rotation and protection.

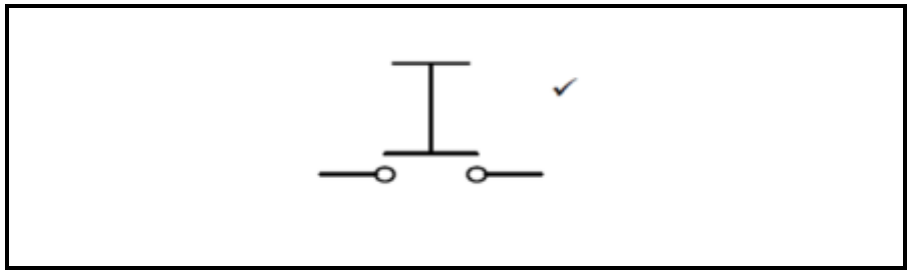
4. The over current sensor is operated by a bi-metallic strip. As the current increases, it causes the heating element to gradually heat up. The heating element steadily heats up the bi-metallic strip. If set correctly, the bi-metallic strip bends to unlatch a mechanism which toggles the circuit breaker to the OFF position. This opens the contacts of the circuit breaker and breaks the circuit.

5. **Purpose of the following Direct-on-Line (DOL) starter components:**

5.1 They are electromagnetically operated switches that provide a safe and convenient means of connecting and interrupting circuits.

5.2 It prevents serious damage to the motor by disconnecting the supply when the rated current is exceeded.

6.



7. To remove the motor from service when a low voltage condition develops. This stops the motor from drawing excessive currents that could cause damage.

8.

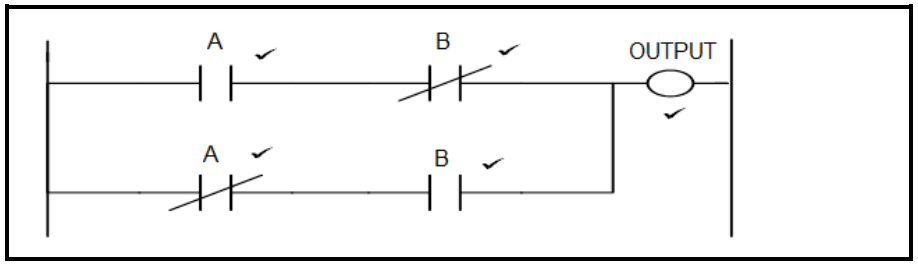
- Input scan
- Process scan
- Output scan

9.

9.1

A	B	OUTPUT	
0	0	0	✓
0	1	1	✓
1	0	1	✓
1	1	0	✓

9.2 Ladder logic diagram

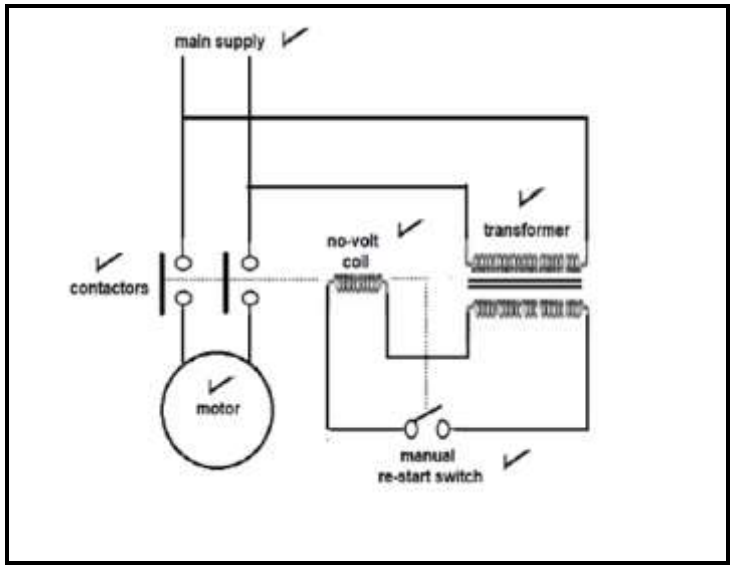


10. A latch makes it possible for an event to remain triggered on regardless of whether the activating trigger is on or off.

11. The bi-metallic strip size, shape, and the material it is made of.

12. Hardware is all the parts of PLC that you can see, (CPU, monitors, input devices and output devices) Software is the machine language that is installed on a computer or written into a PLC's control.

13.



14. In the event of power cut the motor cannot self-start when power is restored.

15.

- Overload
- Short – circuit
- Ground or earth fault

16. At normal operating temperature, the conductive particles form low resistance paths through the polymer beads.

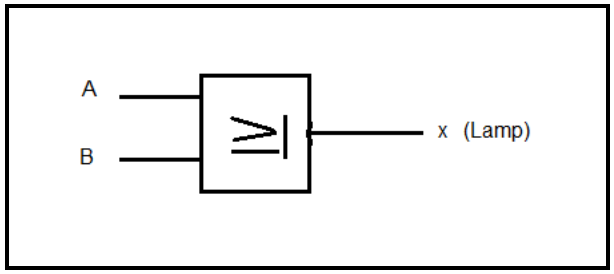
If the temperature rises above the PTC designed limits, the crystallites in the polymer melt and become a shapeless mass, increasing their volume.

This pushes the conductive particles apart causing the two temperature to rise and PTC ‘trips’ causing the current flow to fall to a safe level, protecting the equipment.

17.

17.1 OR gate.

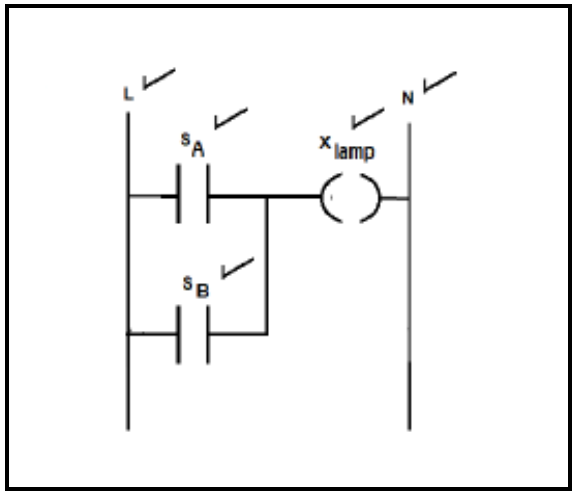
17.2



17.3

input		output
A	B	X
0	0	0
0	1	1
1	0	1
1	1	1

17.4



18.

- Set input OTL (latch)
- Reset input OTU (unlatch)