

- 5a. The losses in a power transformer are generated in the form of heat and it is essential that the temperature is kept below a certain level. With the aid of diagrams, explain three (3) methods, with the aid of diagrams, how this can be achieved. **(15 marks)**
- b. A power transformer needs to be maintained periodically. Mention, at least five points, how a transformer can be kept maintained. **(5 marks)**
- 6a. Electric motors are usually classified by the type of enclosure used. Mention four (4) types of enclosures. **(4 marks)**
- b. Describe two (2) types of motor enclosures and give one application for each type. **(10 marks)**
- ci. With the aid of a circuit diagram explain the operation of a capacitor start single-phase induction motor. **(4 marks)**
- ii With the aid of a circuit diagram explain how the rotation of this motor can be reversed. **(2 marks)**

END OF PAPER

**EXAMINATION FOR THE ISSUE OF A LICENCE
TO ACT AS WIREMAN - LICENCE 'B'**

Paper II (Electrical Installation Technology)

Time Allowed: 3 Hrs

June 2012

**WRITE ALL YOUR WORK IN THE ANSWER BOOK PROVIDED.
EVERY ANSWER SHOULD INCLUDE ALL WORKINGS, NECESSARY
DIAGRAMS AND FORMULAE.**

START EACH ANSWER ON A FRESH PAGE.

Answer any **FIVE** Questions

1. A large workshop consists of electrical operated steel machines. One of the machines develops an earth fault. The metal frame of the machine becomes live.
 - a. Explain in detail what precautions one will carry-out to repair the fault without stopping the other machines. **(6 marks)**
 - b. While repairing the fault, a worker accidentally touches the machine frame metal and becomes electrocuted while touching the frame. Describe the procedure to be followed before applying first aid. **(6 marks)**
 - c. State briefly how to apply Artificial Respiration on a person suffering from electric shock. **(8 marks)**

- 2a. Using a clear and well-labelled diagram describe the component parts and construction of a three-core armoured cable with thermosetting insulation. **(7 marks)**

- b. What is a CONSAC Cable?
Using a clear and well-labelled diagram describe the component parts and construction of this type of cable. **(7 marks)**

- c. Give the advantages and disadvantages of both types of cables. **(6 marks)**

- 3a. Analyse the following and indicate in each case how they may be minimised or eliminated.
 - i. Current leakage to earth from a current carrying conductor.
 - ii. A newly connected a.c. induction motor fails to start rotating while a humming noise is heard from inside it.
 - iii. Low power factor in an installation.
 - iv. Arcing at contact brushes of a series universal motor.
 - v. A current surge in a conductor during a lightning storm. **(3 marks each)**

- b. The positive brush of a dynamo giving a constant potential of 115 volts is connected through a voltmeter of 18000 ohms to the ground. What is the insulation resistance between the negative brush and the ground if the voltmeter reads 17.5 volts **(5 marks)**

- 4a. Copy on your answer book and complete the following sentences:-
 - i. A fire extinguisher filled with Powder is used to extinguish _____. **(1 mark)**
 - ii. A fire extinguisher filled with CO₂ is used to extinguish _____. **(1 mark)**
 - iii. A fire extinguisher filled with Foam is used to extinguish _____. **(1 mark)**
 - iv. A fire extinguisher filled with water is used to extinguish _____. **(1 mark)**
 - v. Temperature Classification T6 is _____°C. **(1 mark)**
 - vi. Ingress Protection is abbreviated _____. **(1 mark)**

On the drawing provided in the answer book answer the following;

- b. An Office block is required to be protected against fire. The Insurance Broker recommended that a Fire alarm system must be installed. Describe the special requirements for this fire alarm system installation. Complete the drawing by showing all the special requirements to erect the fire alarm system. **(10 marks)**

- c. Indicate and explain where you install an emergency lighting system and the type of light fitting used. **(4 marks)**

