

**ELC – Electrical Drawing**

**T002**

**Friday, 11/11/2016**

**08:30 – 11:30**

WORKFORCE DEVELOPMENT AUTHORITY



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**ADVANCED LEVEL NATIONAL EXAMINATIONS, 2016,  
TECHNICAL AND PROFESSIONAL STUDIES**

**EXAM TITLE: Electrical Drawing**

**OPTION: Electricity (ELC)**

**DURATION: 3hours**

**INSTRUCTIONS:**

The paper is composed of **three (3) main Sections** as follows:

**Section I: Thirteen (13) compulsory questions. 55 marks**

**Section II: Attempt any three (3) out of five questions. 30 marks**

**Section III: Attempt any one (1) out of three questions. 15 marks**

**Note:**

***Every candidate is required to carefully comply with the above instructions. Penalty measures will be applied on their strict consideration.***

**Section I. Thirteen (13) Compulsory questions****55marks**

- 01.** What is application of intermediate switch? **2marks**
- 02.** Differentiate the modes of diagram used in electricity. **4marks**
- 03.** Draw forward and reverse starter of three phase squirrel cage induction motor by using camswitch. **5marks**
- 04.** Draw a labelled diagram of the connections of instruments used to measure the power, current and voltage in the ac circuit supplying a load. **5marks**
- 05.** Draw schematic and wiring diagram to represent two one way switches, the first is used to control two lamps in parallel and second is used to control one lamp. **4marks**
- 06.** Draw a labelled circuit and wiring diagram for one lamp controlled in two different ways. **3marks**
- 07.** Draw a labelled circuit, wiring and schematic diagrams for one lamp controlled in three different positions. **4marks**
- 08.** Draw circuit and wiring diagram to represent a door opener circuit. **4marks**
- 09.** Draw wiring diagram to represent an impulse switch used to control a lamp in hazardous area. **5marks**
- 10.** Draw circuit and wiring diagram to represent a bell switching circuit. **4marks**
- 11.** Draw a circuit and schematic diagrams to represent the application of double two way switches. **4marks**
- 12.** Complete the following table. **6marks**

<b>Connection group</b>	<b>Circuit symbol</b>	<b>Short form symbol</b>	<b>Description</b>
<b>Yy<sub>0</sub></b>			
<b>Dy<sub>5</sub></b>			
<b>Yd<sub>5</sub></b>			
<b>Yz<sub>5</sub></b>			

- 13.** Draw power circuit of forward and reverse with stator resistor starter of three phase squirrel cage induction motor. **5marks**

**Section II. Choose and answer any three (3) questions.**

**30marks**

**10.** Represent the winding connections of a D / yy and y /yy two speed motor when running in low speed and when running in high speed.

**10marks**

**11.** Draw the power circuit of a two separate winding three-phase induction motor with fuses and overload relay for protection.

**10marks**

**12.** Draw the power circuit of a Dahlander motor operated in forward and reverse.

**10marks**

**13.** A three-phase induction motor is to be D.O.L started . It is also to be protected against short-circuits and overload. Draw the power circuit enabling this operation knowing that the size of the overload relay is less than the motor rated current .

**10marks**

**14.** Draw the typical circuit diagram with bridging of overload relay during starting. (with overload relay and without overload relay.

**10marks**

**Section III. Choose and answer any one (1) question.**

**15marks**

**15.** A three phase induction motor is to be protected against short-circuit and overload . It is started in D.O.L, forward and reverse. The size of available is less than the motor rated current. Draw the power circuit showing the protection of this motor.

**15marks**

**16.** Draw the control circuit of reversing a three phase motor with actuation and without actuation of the stop pushbutton.

**15marks**

**17.** Draw the power circuit of a three speed motor (combination of Dahlander motor and separate winding motor ) controlled in forward.

**15marks**



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- 03.** Draw forward and reverse starter of three phase squirrel cage induction motor by using camswitch. **5marks**
- 04.** Draw a labelled diagram of the connections of instruments used to measure the power, current and voltage in the ac circuit supplying a load. **5marks**
- 05.** Draw schematic and wiring diagram to represent two one way switches, the first is used to control two lamps in parallel and second is used to control one lamp. **4marks**
- 06.** Draw a labelled circuit and wiring diagram for one lamp controlled in two different ways. **3marks**
- 07.** Draw a labelled circuit, wiring and schematic diagrams for one lamp controlled in three different positions. **4marks**
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