ADVANCED LEVEL NATIONAL EXAMINATIONS, 2014
TECHNICAL AND PROFESSIONAL TRADES

EXAM TITLE : Domestic Electricity and Plumbing

OPTION : Construction (CST)

DURATION : 3 hours

INSTRUCTIONS :

The paper consists of three (3) Sections:

Section I: Sixteen (16) questions, all Compulsory. 55 marks

Section II: Five (5) questions, Choose any Three (3). 30 marks

Section III: Three (3) questions, Choose any One (1). 15 marks

Use two separate answer booklets: Domestic Electricity and Plumbing respectively.
SECTION I. SIXTEEN (16) COMPULSORY QUESTIONS.

01. What do you understand by “Direct Electricity”? How is it produced? 4 marks

02. Give at least 3 examples of use of the “Direct Electricity”. 3 marks

03. If an electric heater is rated at 4.5 kilowatts, then calculate how much current it uses if the supply voltage is 240 Volts. 2 marks

04. a) What does earthing do?

   b) Give four (4) criteria of good earth;

   c) Name four (4) types of recognized earth electrodes. 5 marks

05. Name Six (6) items of household equipment that might use the wall sockets outlets. 3 marks

06. Calculate the resistance (R) of 120 m length, of 2.5 mm² cross-sectional area (A) copper conductor for which the specific resistance (ρ) is 17.5*10⁻⁹ Ωm. 4 marks

07. Define briefly how to remove a victim of electrical shock from the fault. 2 marks

08. Name the three (3) types of wire conductor and cables classified by the type of their covering. 3 marks

09. State the three (3) drawbacks of wrong cable end termination. 3 marks

10. a) What is an electrical fuse?

   b) Give three (3) types of commonly used fuses. 4 marks

11. State any three (3) tools that are mostly used in plumbing activities. 3 marks

12. What are the basic skills for pipe fitters? 4 marks

13. Name the four (4) methods used for fixing in plumbing. 4 marks

14. The hacksaw is the most important cutting tool for sawing metal to the required size. Which procedures are recommended during sawing metals? 5 marks

15. Give at least three (3) materials commonly used to make sanitary appliances. 3 marks

16. Convert the following measurement values:

   a) 10 m = ... ? Inches

   b) 32 cm = ... ? Inches

   c) 0.0625 inch = ... mm
SECTION II. ATTEMPT ANY THREE (3) QUESTIONS.

7. Explain five (5) basic electricity rules or Principles used in electricity.  

8. It is required to install a long corridor with several doors and the electrician decide to do it by installing two (2) incandescent lamps controlled from four (4) different positions with two earthed socket outlet.

   Produce: a) The circuit diagram of this installation.  
               b) The wiring diagram of this installation.

9. a) Find the equivalent resistance $R_{AB}$ for the following circuit:

   ![Circuit Diagram]

   b) State and explain any four (4) effects of electric shock.

10. With a neat sketch, describe a pipe cutter and the step followed to cut a steel pipe.

11. a) Describe step by step the process of working out the heat length for 90 bend on a piece of 25mm radius of steel pipe.

   b) State any Four (4) properties of plastic pipes and fittings.

SECTION III. ATTEMPT ANY ONE (1) QUESTION.

12. Describe briefly the process of electrical power generation up to the user.

13. Two resistors of values 1kΩ and 4kΩ are connected in series across a constant voltage supply of 100 Volts. A voltmeter having an internal resistance of 12kΩ is connected across the 4kΩ resistor. Draw the circuit and calculate:

   a) True voltage across 4kΩ resistor before the voltmeter was connected.

   b) Actual voltage across 4kΩ resistor after the voltmeter is connected and the voltage recorded by the voltmeter.

   c) Change in supply current when voltmeter is connected.

   d) Percentage error in voltage across 4kΩ resistor.
24. When water is discharged from a sanitary fitting by flushing a toilet or draining a basin, then some of the water should stay in the trap to maintain the seal. However it is difficult to prevent air gaps for gases and smells to pass through.

Discuss possible ways that air gaps can be created and remedied. 15 marks