

**CST&PWO – Domestic Electricity  
and Plumbing**

**T028**

**Monday, 26/11/2018**

**08:30 – 11:30 AM**

**WORKFORCE DEVELOPMENT AUTHORITY**



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**ADVANCED LEVEL NATIONAL EXAMINATIONS, 2018,  
TECHNICAL AND PROFESSIONAL STUDIES**

**EXAM TITLE:**

**DOMESTIC ELECTRICITY AND PLUMBING**

**OPTIONS: Construction (CST); Public Works (PWO)**

**DURATION: 3 hours**

**INSTRUCTIONS:**

The paper is composed of **the following sections:**

**Section I: Fifteen (15) 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.***

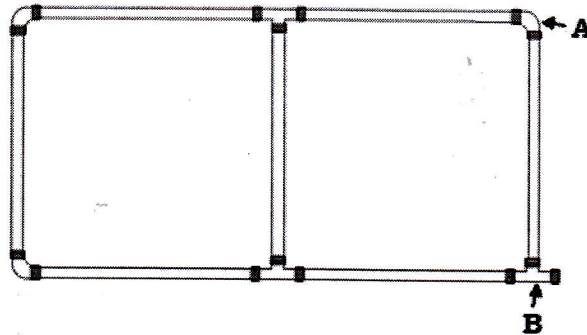
**Section I. Fifteen (15) Compulsory questions****55 marks**

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- 01.** Give the difference between a good conductor and an insulator of electricity. **(2 marks)**
  - 02.** Label Five (5) basic components of an electrical circuit. **(5 marks)**
  - 03.** Give at least Four (4) necessary treatments to perform to someone who receives the electric shock. **(4 marks)**
  - 04.** List any Four (4) causes of fire in electrical equipment. **(4 marks)**
  - 05.** If a P.d. of 12V maintains a current of 3A through a resistor, what will be the electrical energy  $W$  changes to heat per second? **(4 marks)**
  - 06.** The current flowing through a resistor is 0.8A when a p.d.of 20V is applied. Determine the value of the resistance. **(4 marks)**
  - 07.** What is an electrical current? **(2 marks)**
  - 08.** What is the standard frequency of the electricity supply in Rwanda? **(2 marks)**
  - 09.** Mention any Four (4) applications of mild steel pipes. **(4 marks)**
  - 10.** State any four (4) different types of pipes used in plumbing. **(4 marks)**
  - 11.** Name Four (4) joints used for PVC pipes. **(4 marks)**
  - 12.** State at least four (4) general jobs of a plumber. **(4 marks)**
  - 13.** What are the applications of an elbow and a nipple fitting used in plumbing? **(4 marks)**
  - 14.** List any Four (4) methods used for fixing in plumbing. **(4 marks)**
  - 15.** Identify the difference between a die and a tape used in plumbing work. **(4 marks)**

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

**30 marks**

16. Given the sketch below of steel pipe threaded jointing work, there are non-represented fittings:



- (a) Name the labeled fittings, A and B;  
(b) What and how many (min.) are these non-represented fittings to make the work possible?  
(c) Propose where the unspecified fitting it / they can be fixed to make the work possible.

**(10 marks)**

17. (i) What do you know about:

- Electrostatic force
- Resistors
- Rectifier

- (ii) With concrete examples, explain the difference between the alternative current and direct current.

**(10 marks)**

18. (i) While assembling galvanized steel pipe, it requires the application of Teflon tape/ thread sealing tape, identify at least two reasons of it.

- (ii) Explain in brief the term "nominal diameter (ND)" used for pipe sizes;

- (iii) Name the apparatus used to measure the consumed water for domestic water supply. (XANI)

**(10 marks)**

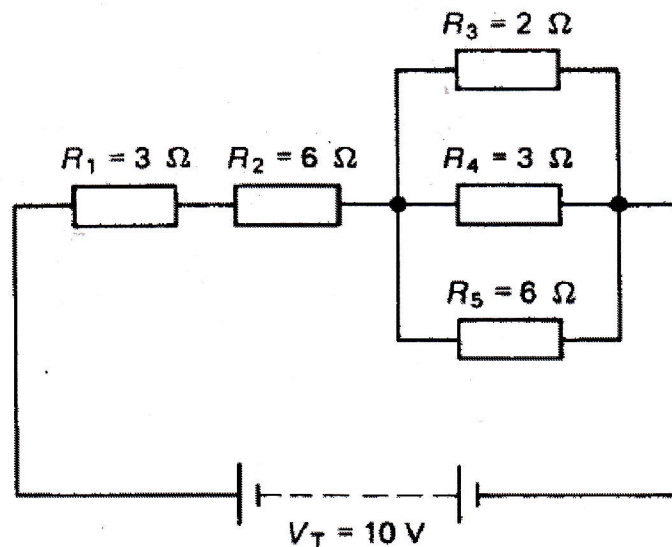
19. i) Determine at least two the types of cable sizes normally used for domestic electrical installation.

- ii) Magnetic materials are classified as either magnetic or nonmagnetic materials based on the highly magnetic properties of iron. List down the three groups in which those materials are classified.

**(10 marks)**



20. A) Resolve the circuit shown in Figure below into a single resistor and calculate the potential difference across each resistor.



- B) List out at least five (5) types of electrical energy sources and make a short explanation on each type. **(15 marks)**

21. A) For all residential and commercial buildings, copper tube is leading the choice of modern contractors for plumbing. List at least five (5) reasons why copper tube is of first choice in comparison with other tubes.

- B) Explain the following two different processes used for bending pipe and tube:

- i) Press Bending
- ii) Rotary Draw Bending

**(15 marks)**

22. A) Electrical energy can be generated from power generating stations, transmitted through power conductors, and distributed to the power consumers (loads) with help of different components including transformers. Define a transformer, how it works and discuss the role of the transformer in electrical network (from generation to consumption) with some diagram showing its parts.

- B) Plumbing is very important in our daily life. Describe this concept by showing also the applications (examples) of plumbing system in our local communities and services.

**(15 marks)**

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