CST & PWO – Domestic Electricity and Plumbing

T036

Friday, 13/11/2015
14:00 – 17:00

WORKFORCE DEVELOPMENT AUTHORITY

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ADVANCED LEVEL NATIONAL EXAMINATIONS, 2015, TECHNICAL AND PROFESSIONAL TRADES

EXAM TITLE: **Domestic Electricity and Plumbing**

OPTIONS: **- Construction (CST)**

- Public Works (PWO)

DURATION: **3hours**

INSTRUCTIONS:

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

Section **I**: Seventeen **(17)** questions, all **Compulsory**. **55marks**

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

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

Every candidate is required to strictly obey the above instructions. Punishment measures will be applied to anyone who ignores these instructions.

Section I. Seventeen (17) Compulsory questions. **55marks**

01. Differentiate an open-circuit from a short-circuit. **3marks**

02. What is a circuit breaker? Name three (3) types of circuit breaker. **5marks**

03. Give at least Four (4) desirable characteristics of insulation which protects electrical devices. **2marks**

04. Briefly state and explain the types of electrical supply voltage levels. **6marks**

05. List any Three (3) reasons for earthing electrical devices. **3marks**

06. Give the value of the minimum electric current which can pass through a person then it can cause death. **1mark**

07. Give Six (6) things that severity of an electric shock will depend on. **3marks**

08. State the Charles Augustin coulomb's law. **3marks**

09. Apply the potential divider method to calculate the value of voltage V_1 and V_2 in the following figure: **4marks**

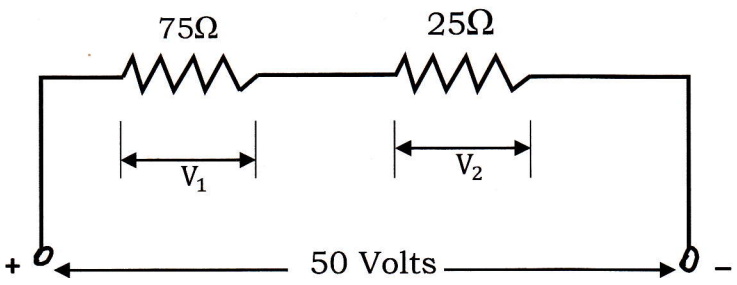

Figure1.

10. What is plumbing? Name three (3) main types of pipes used in plumbing. **3marks**

11. Name four (4) measuring tools and four (4) cutting tools used in plumbing. **4marks**

12. Give the application of a union fitting used in plumbing. **2marks**

13. State three (3) methods used to bend steel and copper pipes. **3marks**

14. Name the following plumbing tool and fitting illustrated below in figure (a) & (b) and give the application for each one. **4marks**

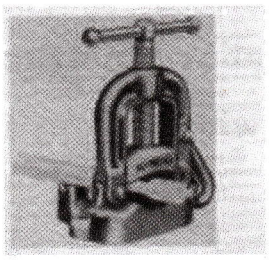

Figure (a)

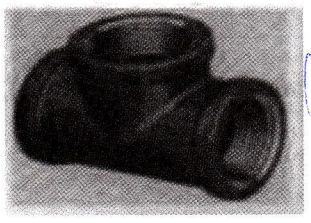

Figure (b)

15. List any four (4) factors which may be considered in selection of pipes. **4marks**

16. Complete the table bellow of the recommended pipe wrench size and size of the pipe: **2marks**

S/N	Pipe size (inches)	Wrench size (inches)
a	3/4	?
b	?	18
c	?	24
d	1	?

17. Give three (3) types of pipes used in drainage work. **3marks**

Section II. Answer any three (3) questions of your choice

(Do not choose more than <u>three questions</u>). 30marks

18. a) Give all different factors that are usually considered when we have to choose the diameter of the pipe and the dimensions of the water heater needed for providing the domestic hot water.

b) Calculate the flow rate (in liters/minute) if 10 liters bucket takes 80 second to fill. **10marks**

19. Electrical shock occurs when a person becomes part of the electrical circuit; and the severity of the shock will depend on the level of current and the length of time it is in contact with the body. Give the action to be taken in the event of an electrical shock. **10marks**

20. Give two (2) types of electric charges and give their properties. **10marks**

21. Consider two (2) charges q_1 of $+3.01*10^{-6}C$ and q_2 of $-3.01*10^{-6}C$ separated by r=2.5cm. Calculate and show the force between the two electrically charged objects. Take the constant $K=8.991*10^9\ Nm^2/C^2$ **10marks**

22. Plumbing satisfies the basic needs of people to keep clean, warm and healthy by providing hot and cold water systems and sanitation. What a competent plumber should be able to do? **10marks**

Section III. Answer any one (1) question of your choice
(Do not choose more than one question). 15marks

23. State and explain the three (3) methods of electric wires identification.

15marks

24. Two batteries of e.m.f.10Volts each and internal resistance of 0.5Ω are connected in:

(i) Series;

(ii) Parallel, to supply a load which has a resistance of 4Ω.

Make circuit diagrams of these circuit connections.

Calculate the current and the voltage across the load in each case.

15marks

25. Describe the copper pipes types and tubes. Provide also their identifications and their use.

15marks