



UGANDA INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY

END OF SEMESTER I EXAMINATIONS ACADEMIC YEAR 2017/2018

DEPARTMENT : ICT

YEAR OF STUDY : TWO

PROGRAMME : Diploma in Electrical & Electronic Engineering (DEEE)

COURSE : ELECTRICAL & ELECTRONICS WORKSHOP

COURSE CODE : EET1202

DATE : WEDNESDAY, DECEMBER 7, 2017

TIME : 09:00 – 12:00HRS

DURATION : 3 hours

INSTRUCTIONS:

- (i) The Paper consists of two sections (A) and (B)
- (ii) Attempt ALL questions from Section (A) which is Compulsory, and ANY THREE questions from section (B)
- (iii) Begin each number on a new page of the answer booklet.
- (iv) Credit will be given for use of relevant examples and illustrations
- (v) You may use ONLY the back page of your answer booklet for rough work
- (vi) Do not write on the question paper.

SECTION A [40 MARKS]

Multiple Choice Questions

Create a table in the answer booklet with **one** column having numbers 1 to 10.

Write the letters against question numbers corresponding to the best alternatives.

1. How is the waveform on CRO screen adjusted?
A. by adjusting the voltage B. through shift controls
C. by reducing the current D. by means of a galvanometer
2. Period of a waveform on CRO screen is obtained by the relation
A. *number of divisions occupied by 1 cycle $\times$ time*
B. *number of divisions occupied by 1 cycle $\times$ 1 / division*
C. *number of divisions occupied by 1 cycle $\times$ time division*
D. *number of divisions occupied by 1 cycle*
3. How is frequency related to time period?
A. square proportional B. not related
C. directly proportional D. inversely proportional
4. How is a 3.9 K Ω resistor color-coded?
A. red, white, red, gold B. red, green, orange, silver
C. orange, white, red, gold D. orange, green, orange, silver
5. What are the two major categories for resistors?
A. low and high ohmic value B. commercial and industrial
C. low and high power value D. fixed and variable
6. What is the most commonly used conductor material in electrical and electronics circuits?
A. aluminum B. copper C. gold D. silver
7. In soldering the melting point of filler metal is
A. below 420°C B. above 420°C C. below 520°C D. above 520°C
8. The composition of electrician solder is
A. lead-37%, tin-63% B. lead-50%, tin-50% C. lead-63%, tin-37% D. lead-70%, tin- 30%
9. For household wiring and small units, the following should be used for safety measure
A. CB B. ACB C. OCB D. MCCB
10. The following class of fire occur in electrical equipment
A. Class-A fires B. Class-B fires C. Class-C fires D. All of these

[1 mark@] (10 marks)

Short Essay Questions

11. (a) What is a tool?
(b) List **two** important tools used in electrical wiring. (3 marks)
12. If current flow exceeds the rated ampere value:
(a) Which device can be used to protect the circuit other than the fuse?
(b) How is this done? (3 marks)
13. State and explain **three**:
(a) Common electrical wire joints and splices.
(b) types of connectors and their area of application (12 marks)
14. (a) Suggest **three** benefits of maintaining electrical installations.
(b) Outline **three** main circuit protecting devices (6 marks)
15. Differentiate between earthing and grounding.
What are the **three** characteristics of effective grounding?
List **three** precautions against electrical shocks, other grounding. (6 marks)

SECTION B [60 MARKS]

Attempt **ONLY THREE** Questions in this Section.

Question 1

- a) All systems which use electrical energy have the potential to cause serious harm. As an electrical technician list **five** precautions while working with electricity. **(5marks)**
- (i) List three effects of electricity to the body when it becomes part of the live circuit **(3marks)**
- (ii) During hand to foot shock per one second duration of an alternating current, list two current levels in milliamps and the probable effect on human body **(4 marks)**
- b) For any task to be accomplished when using electricity there must be the use of tools
- I. Name four types of tools we use **(4marks)**
- II. List four precaution while using those tools **(4marks)**

Question 2

- a. For a successful electrical installation the load consumption must be determined by measurement of specific electrical quantities. What are the three main electrical quantities considered? **(3 marks)**
- b. If the input voltage is 240v and the input current is 13 amps in AC circuit and the reading on the energy meter indicates 12kwh Determine: **@2 marks**
- I. Apparent power
- II. Real power consumed
- III. Powerfactor
- IV. Actual power
- c. Draw the circuit diagram of a single phase wiring using fuse switch, CCB, indicator lamp, energy meter and power supply **(9 marks)**

Question 3

- a. Name three types of electrical wires and their color codes **(6 marks)**
- I. List 4 recommended **SWG** in domestic installation according to their cross section (mm^2), amperage and uses **(12 marks)**
- II. Give two reasons why we use staircase wiring **(2 marks)**

Question 4

- a. As a technician the most fundamental skill needed to assemble electronic project is soldering
- I. Define the term soldering and name two tools used in soldering process **(3 marks)**
- II. While choosing a soldering gun there are factors considered, name three of them **(3marks)**
- III. What is the difference between solder and flux **(2marks)**
- IV. List two uses of flux in soldering process **(2 marks)**
- b. For the perfectly soldered joint it should be nice and shiny looking.
- I. Explain some two factors that affect the quality of good joint **(2 marks)**

- II. Explain two types of soldering technologies **(2 marks)**
- III. In every activity there are related problems encountered. What are the three common problems encountered during soldering **(3 marks)**
- IV. Explain three safety considerations which are important to remember while soldering. **(3 marks)**

Question 5

- a. Define the term earthing and explain the two main types **(5 marks)**
- b. For a complete electrical wiring installation, earthing or grounding must be done correctly,
 - i. Give five reasons why earthing should be done **(5 marks)**
- c. As an electrical technician earthing an installation,
 - i. Name five factors you can consider which can affect earth or soil resistance **(5 marks)**
- d. Which instrument is used to measure earth or soil resistivity **(1 mark)**
 - i. Write down the formula for soil resistivity, hence calculate soil resistivity given the distance between instrument spikes to be 1000cm and earth resistance to be 5 ohms **(4 marks)**.