

**MOI UNIVERSITY**

OFFICE OF THE DEPUTY VICE CHANCELLOR

(ACADEMICS, RESEARCH & EXTENSIONS )

**UNIVERSITY EXAMINATIONS**

 **2016/2017 ACADEMIC YEAR**

SECOND YEAR SECOND SEMESTER EXAMINATION

**FOR DIPLOMA**

 **IN**

 **INFORMATION TECHNOLOGY**

**COURSE CODE:** DIT 028

**COURSE TITLE:** DIGITAL ELECTRONICS

**DATE :**  1ST SEPTEMBER, 2016 **TIME:** 2.00 A.M – 4.30 P.M

**INSTRUCTIONS TO CANDIDATES**

* SEE INSIDE.

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MOI UNIVERSITY

SCHOOL OF INFORMATION SCIENCES

DEPARTMENT OF INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION TECHNOLOGY

END OF SEMESTER EXAMS – YEAR II SEMESTER II

2016/2017 ACADEMIC YEAR - SEPTEMBER 2016 EXAMINATIONS

DIT 028: DIGITAL ELECTRONICS

Time: 2 hours 30 minutes

*Instructions to candidates*

* Section A is compulsory
* Answer any two questions in section B

**SECTION A – COMPULSORY: ANSWER ALL QUESTIONS (30 MARKS)**

**QUESTION 1**

1. Explain any **FOUR** reasons for shifting from analog to digital transmission (8 mks)
2. Explain the following terms and state the SI units of each: (6 mks)
3. Resistance
4. Inductance
5. Capacitance
6. With the aid of adiagram, describe the V-I characteristics of PN junction diode. (6 mks)
7. Derermine the total number of possible input combinations of a 3-input AND gate. Sketch a logic symbol and develop a truth table for this logic gate. (5 mks)
8. An 8-bit DAC has an output voltage of the rage of 0-2.55v. define its resolution in two ways.

 (3 mks)

1. Convert 110012 to its equivalent decimal number. (2 mks)

**SECTION B: ANSWER ANY TWO QUESTIONS (20 MARKS EACH)**

**QUESTION 2**

1. Show that X.Y.Z1 + X1.Y.Z1 + Y.Z = Y (4 mks)
2. Evaluate the following: (6 mks)
3. 2310 to Base Two
4. 11011111002 to Base Eight
5. A3F16 to Decimal
6. Explain the following terms: (6 mks)
7. Combination logic circuits
8. Logic system
9. Switching circuit
10. Decoder
11. Capacitor

**QUESTION 3**

1. Explain three factors sffecting capacitance. (6 mks)
2. Briefly describe what is meant by the following terms. (6 mks)
3. Truth table
4. Boolean expression.
5. Universal gate
6. Using a 2-input logic symbol and truth table, explain the meaning and logical operations of the following: (8 mks)
7. NAND GATE
8. NOR GATE

**QUESTION 4**

1. Explain any **FOUR** applications of diodes. (8 mks)
2. With the aid of a circuit diagrams, describe how transistor biasing is achieved. (8 mks)
3. State any **FOUR** advantages of transistors. (4 mks)

**QUESTION 5**

1. State any **TWO** types of analog to digital converters (ADC). (2 mks)
2. State **ohms law,** and use it find the resistance of a coil which draws a current of 200uA from 120 V supply. (4 mks)
3. Find out the step size and analog input for a 4 bit R-2R ladder DAC when input is 1000 and 1111 assume vref =+5v (6 mks)
4. Explain any **FOUR** characteristics of digital to analog converters. (8 mks)

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