



PAN AFRICA CHRISTIAN UNIVERSITY

BSIT

END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: BCIT101

CAMPUS: ROYSAMBU

COURSE TITLE: DIGITAL ELECTRONICS

EXAM DATE: DAY OF WEEK, DATE (DDTH MONTH YEAR)

TIME: START HOUR – END 13:00-17:00 HRS

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other three questions in Section **B**.
- None programmable calculators permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A

(Answer ALL questions in this section)

QUESTION 1

- a) State THREE advantages of binary codes in digital electronics **(03 Marks)**
 - b) Subtract 13 from 15 using the two's complement method. **(03 marks)**
 - c) For the logic expression $Y = AB' + A'B'$. Obtain the truth table and realize its implementation using AND, OR, NOT gate **(04 Marks)**
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SECTION B

(Answer any THREE (3) questions in this section)

QUESTION 2

- a) Convert the Gray coded number 11010011 to its binary equivalent. **(04 Marks)**
- b) Convert the octal number 13254 into its equivalent in decimal systems. **(03 marks)**
- c) Convert the decimal number 85 to XS-3 BCD code. **(03 marks)**

QUESTION 3

- a) Represent -25 in the one's complement system in byte size. **(03 Marks)**
- b) Describe any TWO 4-bit BCD systems **(04 marks)**
- c) Perform the binary addition operation on the following three numbers: 0010, 0001, 0111. **(03 Marks)**

QUESTION 4

- a) Digital logic gates exhibit certain behaviors. Explain any THREE methods used to describe the behavior of gates and circuits. **(06 marks)**
- b) Using your own words, distinguish between the OR gate and the XOR gate **(04 marks)**

QUESTION 5

- a) Apply DeMorgan's theorem to remove the overbar covering both terms from the expression **(04 Marks)**
- $$X = \overline{\overline{C} + D}$$
- a) Explain THREE ways in which Boolean algebra differ from ordinary algebra. **(06 marks)**

QUESTION 6

- b) Describe the significance for ADDERS in Digital Electronics **(04 Marks)**
- c) Convert the following expressions to standard form:
- i. $X = (\overline{A} + \overline{B}) (A + B + C)$ **(03 marks)**
- ii. $X = \overline{A} \overline{B} + A B C$ **(03 marks)**

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