higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T470**(E)**(A8)T

NATIONAL CERTIFICATE

DIGITAL ELECTRONICS N5

(8080365)

8 April 2019 (X-Paper)
09:00–12:00

This question paper consists of 5 pages.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
DIGITAL ELECTRONICS N5
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Calculation processes and calculated answers must be given in THREE fractional radix spaces, for example $10{,}101_2$.
5. ALL sketches must be neat, using a pencil and a ruler with no freehand lines.
6. Use only BLUE or BLACK ink.
7. Keep subsections of questions together.
8. Write neatly and legibly.

QUESTION 1

Convert each of the following numbers to their binary equivalents and do the calculations by following the instruction given in brackets.

$A = 33,25_{10}$ $B = 70,2_8$ $C = B4,C_{16}$

1.1 A × C (Convert the answer to octal.)

1.2 B – $10,01_2$ (Use 2'complements to convert the answer to decimal.)

1.3 C ÷ $11,1_2$ (Convert the answer to hexadecimal.)

(3 × 6) **[18]**

QUESTION 2

Design a BCD (8.4.2.1.) to Gray code decoder and draw the circuit that uses only TWO XOR gates and ONE OR-gate. **[28]**

QUESTION 3

3.1 Draw a circuit diagram of a TWO pin TTL NAND gate. (6)

3.2 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (3.2.1–3.2.4) in the ANSWER BOOK.

3.2.1 The … is the rate of change from a logic 0 to a logic 1 or vice-versa.

A switching speed
B switching velocity
C clock pulse
D trigger pulse

3.2.2 … is the number of output stages which can be connected to single-gate input.

A Fan-out
B Fan-in
C Speed
D Velocity

3.2.3 … is the time that lapses between a change in input and the resultant change in output.

A Period
B Time
C Propagation delay
D Time delay

