



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

**NATIONAL CERTIFICATE
DIGITAL ELECTRONICS N6**

29 JULY 2021

This marking guideline consists of 7 pages.

SECTION A**QUESTION 1**

- 1.1 Synchronous
- 1.2 UART
- 1.3 Modem
- 1.4 Address
- 1.5 Server

(5 × 1) [5]

QUESTION 2

- 2.1 Handshaking
- 2.2 Solar flare
- 2.3 XOR gate
- 2.4 XNOR gate
- 2.5 Hamming code

(5 × 1) [5]

QUESTION 3

- 3.1 False
- 3.2 True
- 3.3 True
- 3.4 False
- 3.5 True

(5 × 1) [5]

QUESTION 4

4.1 High level

4.2 BASIC or FORTRAN or COBOL or any other suitable answer

4.3 Machine code

4.4 Translating

4.5 Compiling

(5 × 1) [5]

QUESTION 5

5.1 C

5.2 B

5.3 B

5.4 B

5.5 D

(5 × 1) [5]

QUESTION 6

6.1 G

6.2 F

6.3 B

6.4 A

6.5 E

(5 × 1) [5]
[30]**TOTAL SECTION A: 30**

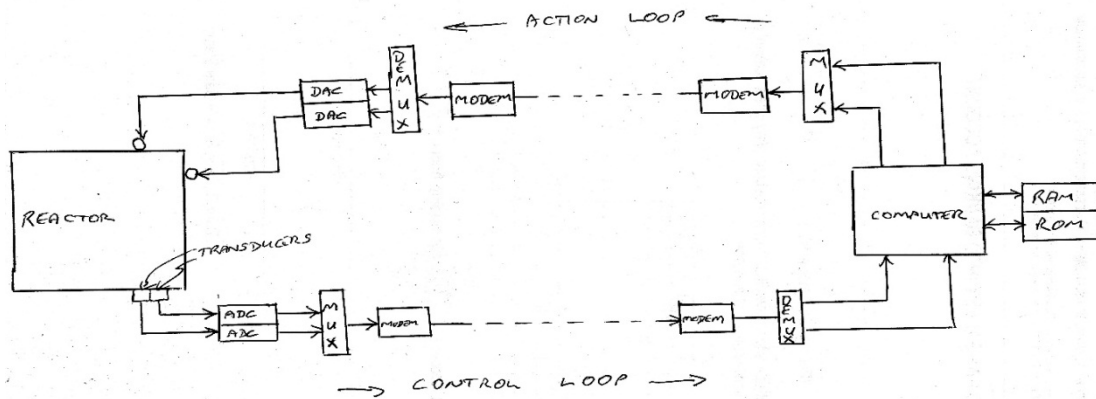
SECTION B

QUESTION 7

7.1 Thermocouple (1)

7.2 Action (1)

7.3



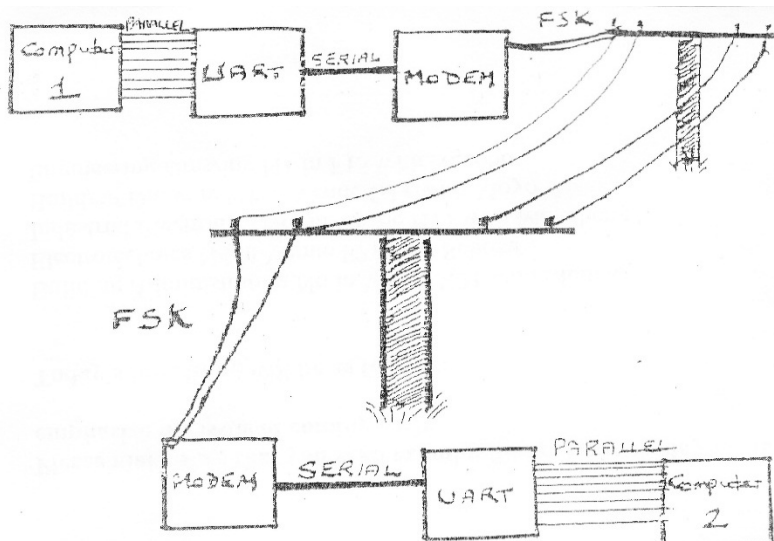
NOTE: The reactor must be named as such. Students must be penalised if they misname it. (12)

- 7.4
- Data selection
 - Data routing
 - Operation sequencing
 - Parallel-to-serial conversion
 - Waveform generation
 - Logic function generation
- (Any 4 × 1) (4)

[18]

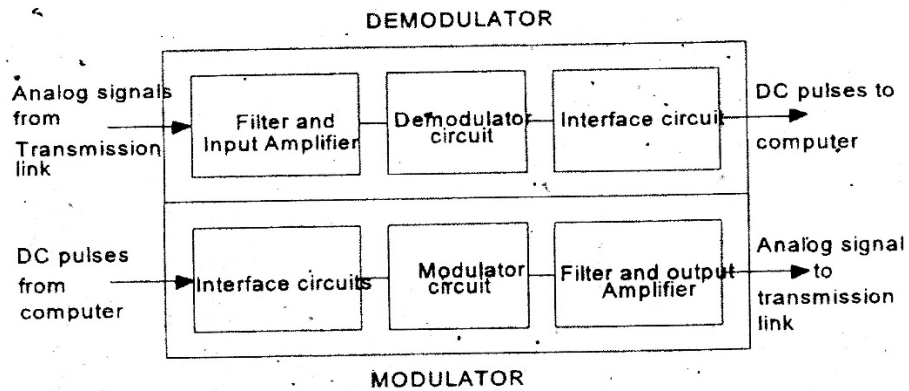
QUESTION 8

8.1



(6)

8.2



(4)

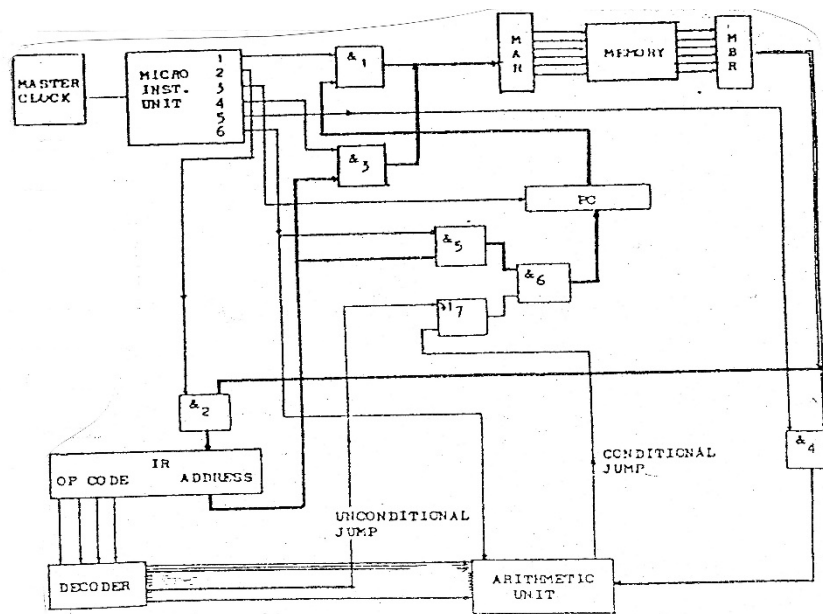
8.3 Modulator-demodulator

(1)

[11]

QUESTION 9

9.1



(10)

9.2 DEMUX

(1)

9.3 1010₂

(1)

9.4 The command to load the accumulator is completed after five pulses. ✓
However, the pulse distributor always generates six pulses regardless. ✓
Therefore, the last pulse will cause no action to be taken, ✓ hence it is a 'do-nothing' phase.

(3)

[15]

QUESTION 10

10.1

<u>PASS</u>	<u>DIRE</u>	<u>STRAITS</u>	<u>MARK</u>
0	8	8	16
- - - - -	- - - - -	15	- - - - -
1		22	23
- - - - -	- - - - -	- - - - -	- - - - -
2		29	30
- - - - -	- - - - -	- - - - -	- - - - -
3			37

8
29
37

- NOTE:**
1. The column “PASS” can start on 1 and not 0.
 2. Each correct row (to the dashed line, which does not have to be included) is worth TWO marks – no half marks. Mistakes must not be followed through.
 3. The final printout below the table **MUST** be in the correct order, one below the other, for TWO marks.

(10)

10.2 Airline, theatre, bus or train reservations; ATM transactions; gaming or any other valid answer

(1)

10.3 Salaries and wages, bills, examination results, or any other suitable alternative

(1)
[12]

QUESTION 1111.1 $1_1 0_2 0_3 0_4 0_5 1_6 1_7 1_8 1_9 0_{10}$

Pos. 1 checks 3; 5; 7; 9

 $0 \ 0 \ 1 \ 1$ – P1 should therefore be 0: Not: 1✓✓

Pos. 2 checks 3; 6; 7; 10

 $0 \ 1 \ 1 \ 0$ – P2 should therefore be 0: It is therefore: 0✓✓✓

Pos. 4 checks 5; 6; 7

 $0 \ 1 \ 1$ – P4 should therefore be 0: It is therefore: 0✓✓

Pos. 8 checks 9; 10

 $1 \ 0$ – P8 should therefore be 1: It is therefore: 0✓✓Therefore, the fault lies on bit $0001_2 = 1_{10}$

Therefore, pos. 1, which is a 1, should be a 0.

I.e. the word should be: 00000011110hamming✓✓

(10)

11.2 $+0,00011101 \times 10^{+110}$ ✓ $= 111,01_2$ ✓ $= 4 + 2 + 1 + 0,25$ $= 7,25_{10}$ ✓

(3)

11.3 $D+E = E+D$ **OR** $D.E = E.D$

(1)

[14]

TOTAL SECTION B:	70
GRAND TOTAL:	100