



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

DIGITAL ELECTRONICS N6

3 April 2020

This marking guideline consists of 6 pages.

SECTION A**QUESTION 1**

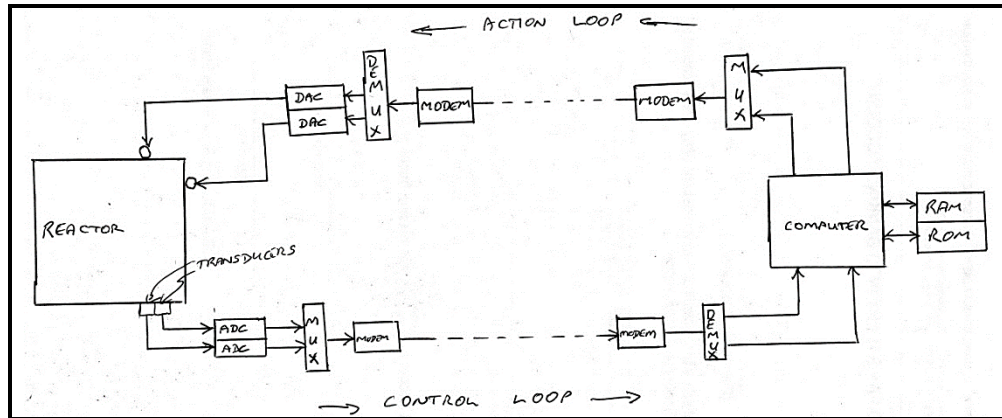
1.1	1.1.1	B		
	1.1.2	C		
	1.1.3	A		
	1.1.4	B		
	1.1.5	C		
			(5 × 1)	(5)
1.2	1.2.1	noncomplementary/nonreflective		
	1.2.2	weighted		
	1.2.3	complementary/reflective		
	1.2.4	nonweighted		
	1.2.5	2421		
			(5 × 1)	(5)
1.3	1.3.1	A		
	1.3.2	G		
	1.3.3	B		
	1.3.4	C		
	1.3.5	D		
			(5 × 1)	(5)
1.4	1.4.1	True		
	1.4.2	False		
	1.4.3	True		
	1.4.4	False		
	1.4.5	True		
			(5 × 1)	(5)
1.5	1.5.1	NAND gate		
	1.5.2	solar flare		
	1.5.3	handshaking		
	1.5.4	XOR gate		
	1.5.5	Gray code		
			(5 × 1)	(5)
1.6	1.6.1	external		
	1.6.2	USB		
	1.6.3	synchronous		
	1.6.4	0,511 V		
	1.6.5	MUX		
			(5 × 1)	(5)
				[30]

TOTAL SECTION A: 30

SECTION B

QUESTION 2: COMPUTER SYSTEMS

2.1 2.1.1



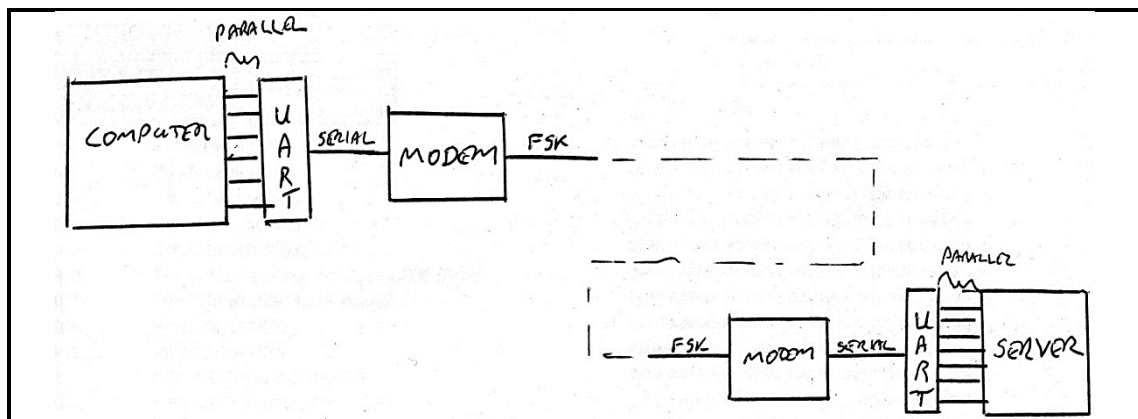
NOTE: The reactor must be correctly named. Candidates must be penalised if they misname it. (12)

2.1.2 Thermocouple✓ (no other device would be able to withstand the stated temperatures) (1)

2.1.3 Seebeck effect (1)
[14]

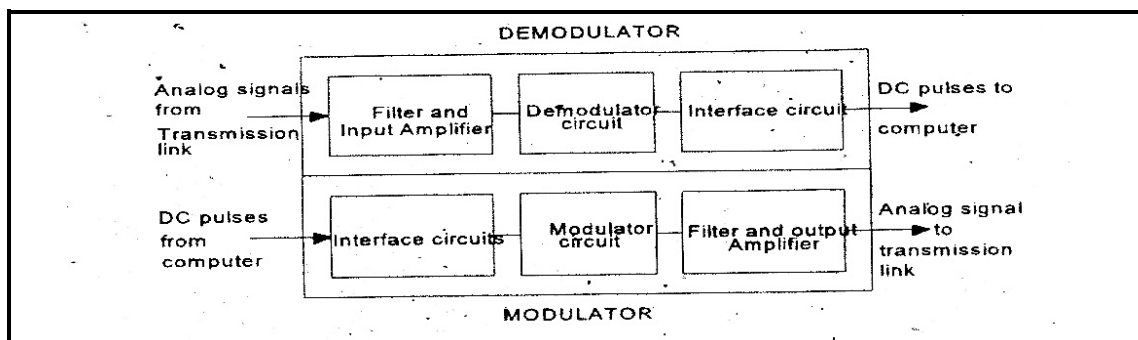
QUESTION 3: TRANSMISSION, DATA AND RELATED SOFTWARE

3.1



(6)

3.2

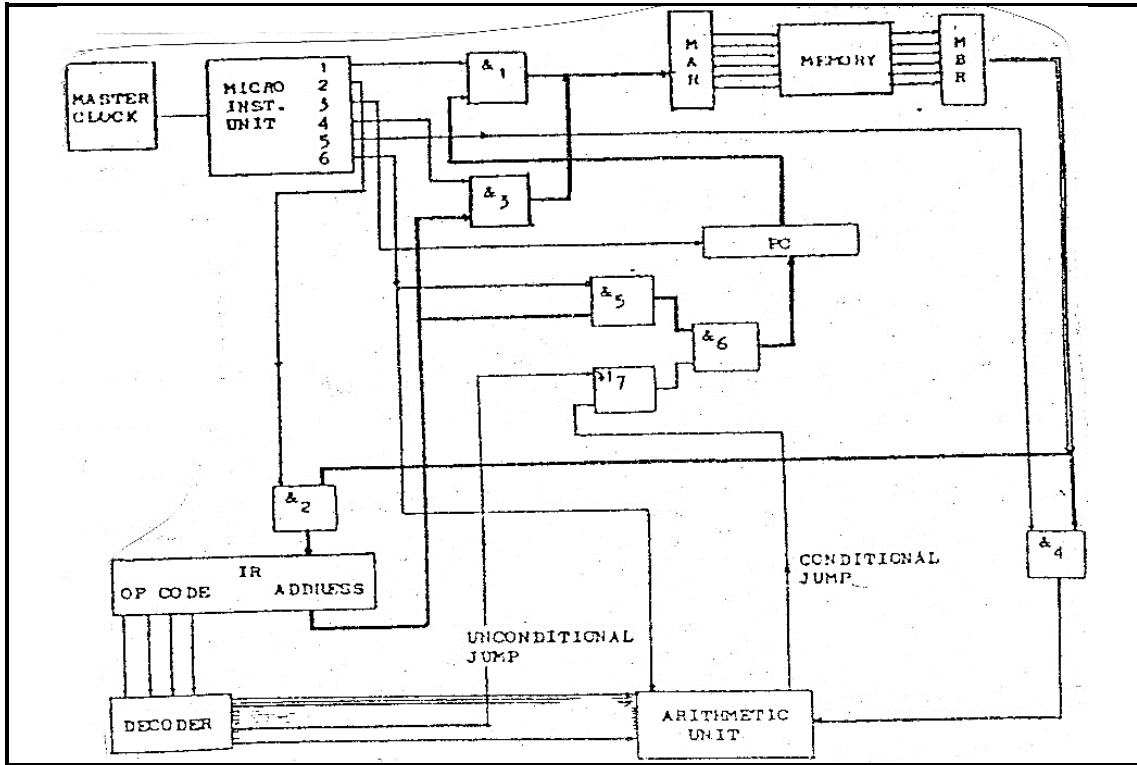


(4)

[10]

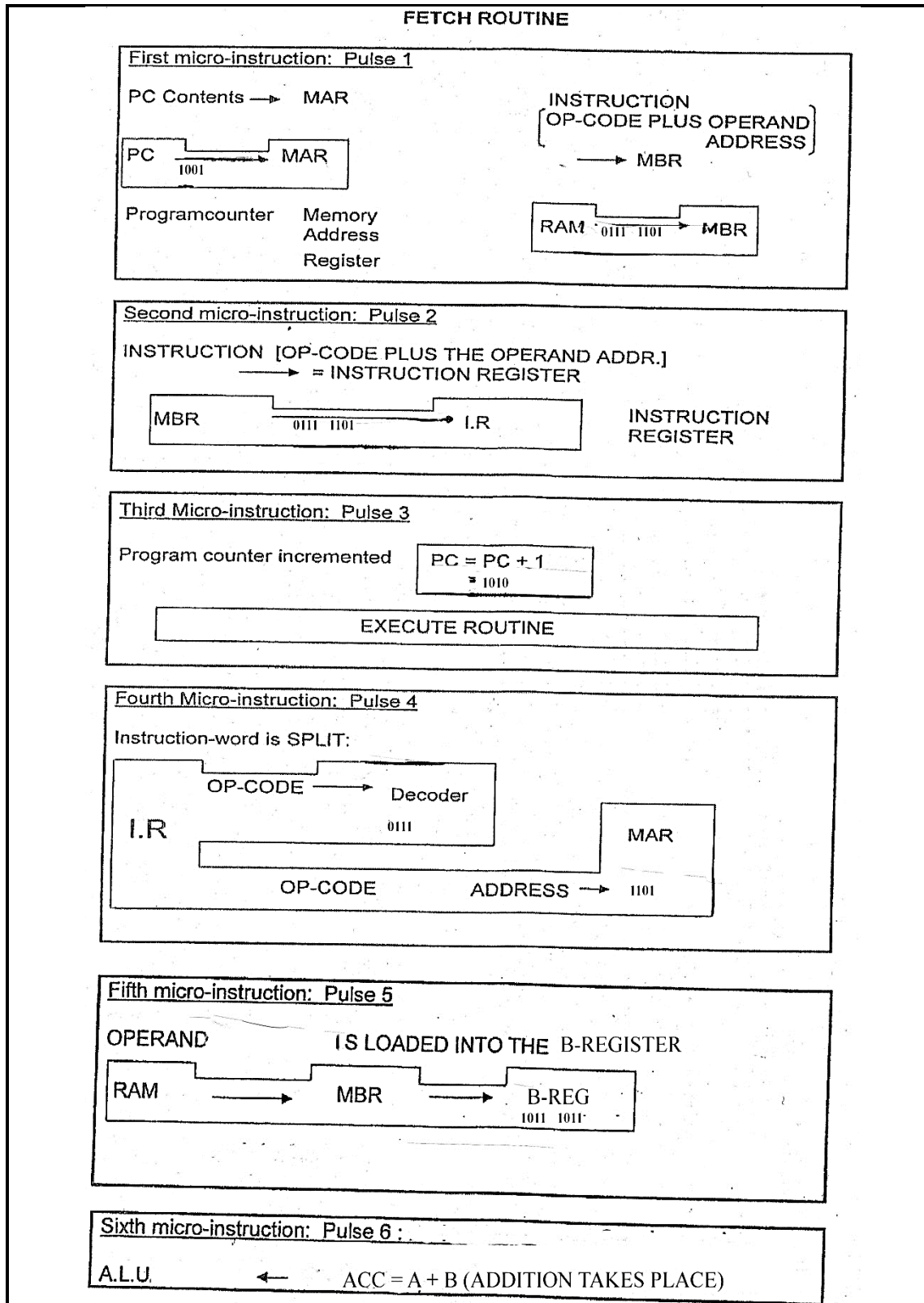
QUESTION 4: COMPUTER ARCHITECTURE

4.1



(10)

4.2



(10)
[20]

QUESTION 5: HIGH-LEVEL PROGRAMMING

5.1 THE WORDS OF WISDOM FOR TODAY✓✓

NOTHING BEGETS NOTHING✓✓✓✓✓✓✓✓✓

NOTE: 2 for the first line + 8 marks for the second line (if it is correct in its entirety) (10)

- 5.2 • FORMula TRANslation✓ (2)
- Commen business-orientated language✓

5.3 Stack pointer
04✓

Stack

<u>Address</u>	<u>Contents</u>
01	68 ₁₆
02	B8 ₁₆
03	8B ₁₆
04✓	3B ₁₆ ✓

(3)

NOTE: 1 for incrementing the stack pointer + 1 for indicating the new address + 1 for including the new contents. If the candidate did not redraw the rest of the stack, only the mark for the correct stack pointer can be given.

- 5.4 • Airline/Railway/Bus reservations
 - Computicket
 - ATM withdrawals
 - Gaming
- (Any relevant 1 × 1) (1)
[16]

QUESTION 6: NUMBER SYSTEMS

0₁ 0₂ 0₃ 0₄ 1₅ 1₆ 1₇ 1₈ 1₉ 0₁₀

Pos. 1 checks 3; 5; 7; 9

0 1 1 1 – P1 should thus be 1: NOT thus: 1✓✓

Pos. 2 checks 3; 6; 7; 10

0 1 1 0 – P2 should thus be 0: IT IS thus: 0✓✓

Pos. 4 checks 5; 6; 7

1 1 1 – P4 should thus be 1: NOT thus: 1✓✓

Pos. 8 checks 9; 10

1 0 – P8 should thus be 1: IT IS thus: 0✓✓

Thus the fault lies on bit 0101₂ = 5₁₀.✓

Thus pos. 5 which is a 1 should be a 0.

i.e. the word should be: **0000011110**hamming✓

[10]

TOTAL SECTION B: 70
GRAND TOTAL: 100