



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE DIGITAL ELECTRONICS N6

8 April 2021

This marking guideline consists of 7 pages.

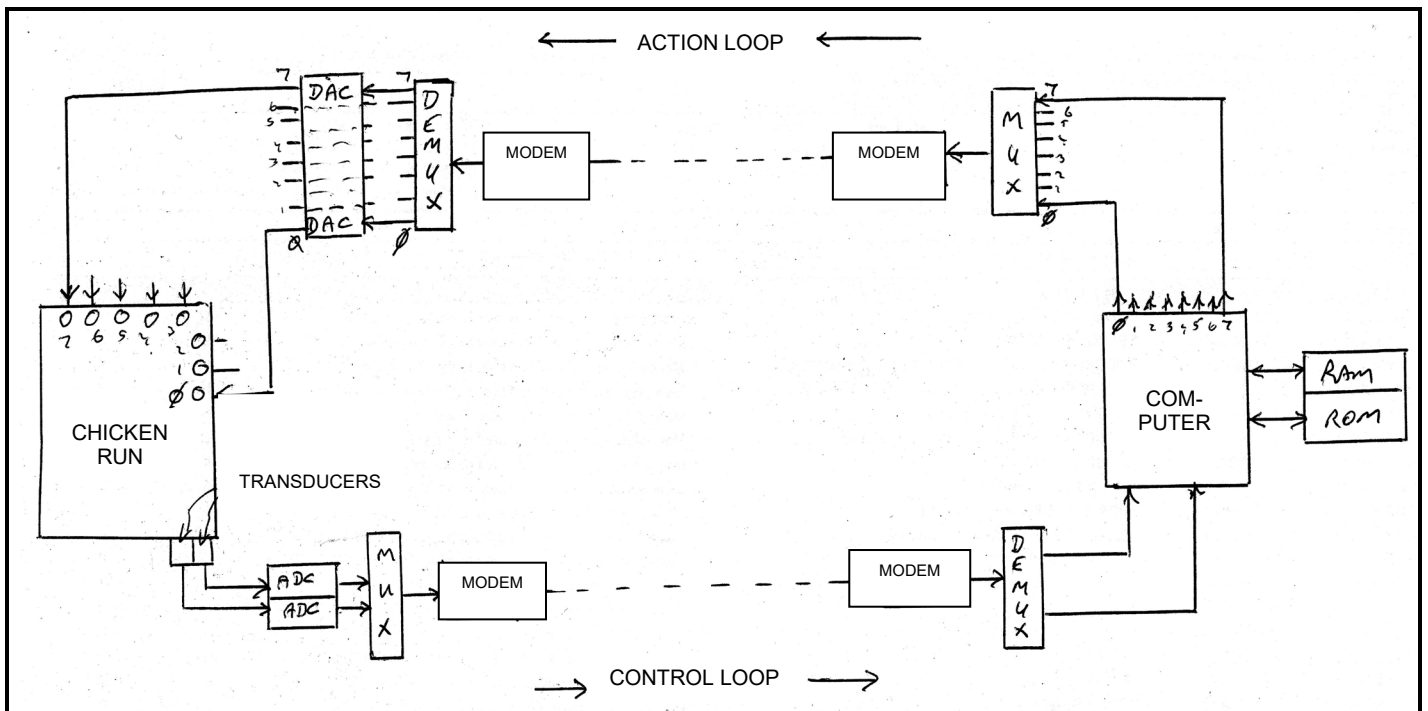
SECTION A**QUESTION 1**

1.1	1.1.1	B		
	1.1.2	C		
	1.1.3	D		
	1.1.4	B		
	1.1.5	B		
			(5 × 1)	(5)
1.2	1.2.1	High-level languages		
	1.2.2	BASIC or FORTRAN or COBOL or any other valid answer		
	1.2.3	Machine code		
	1.2.4	Compiling		
	1.2.5	Translating		
			(5 × 1)	(5)
1.3	1.3.1	D		
	1.3.2	A		
	1.3.3	C		
	1.3.4	G		
	1.3.5	E		
			(5 × 1)	(5)
1.4	1.4.1	True		
	1.4.2	False		
	1.4.3	False		
	1.4.4	False		
	1.4.5	True		
			(5 × 1)	(5)
1.5	1.5.1	Bug		
	1.5.2	8086		
	1.5.3	Flow chart		
	1.5.4	RAM		
	1.5.5	Real-time computing		
			(5 × 1)	(5)
1.6	1.6.1	modem		
	1.6.2	UART		
	1.6.3	Windows		
	1.6.4	1,023 V		
	1.6.5	associative		
			(5 × 1)	(5)
				[30]

TOTAL SECTION A: 30

SECTION B

QUESTION 2

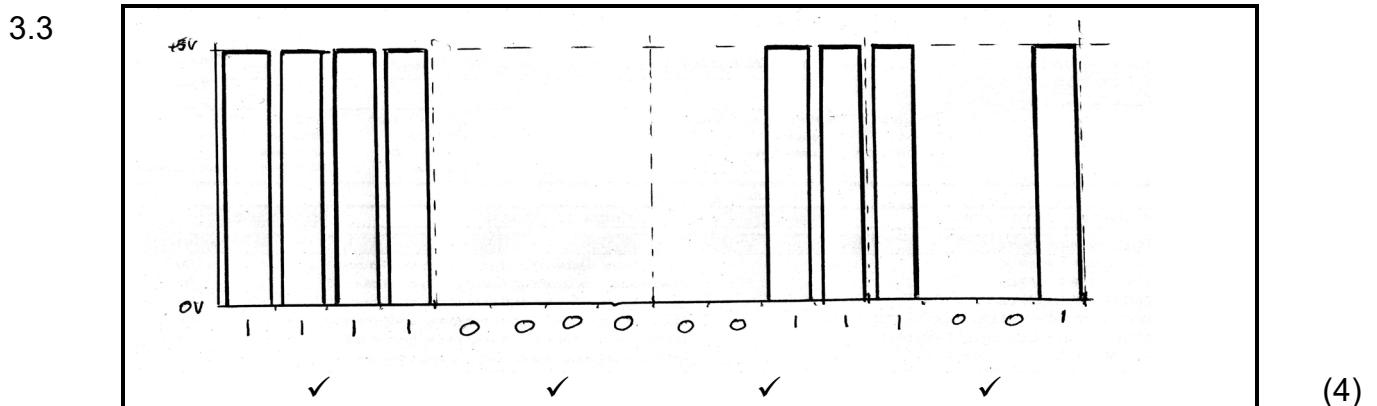


NOTE: The chicken run must be named as such. Candidates must be penalised if they misname it.

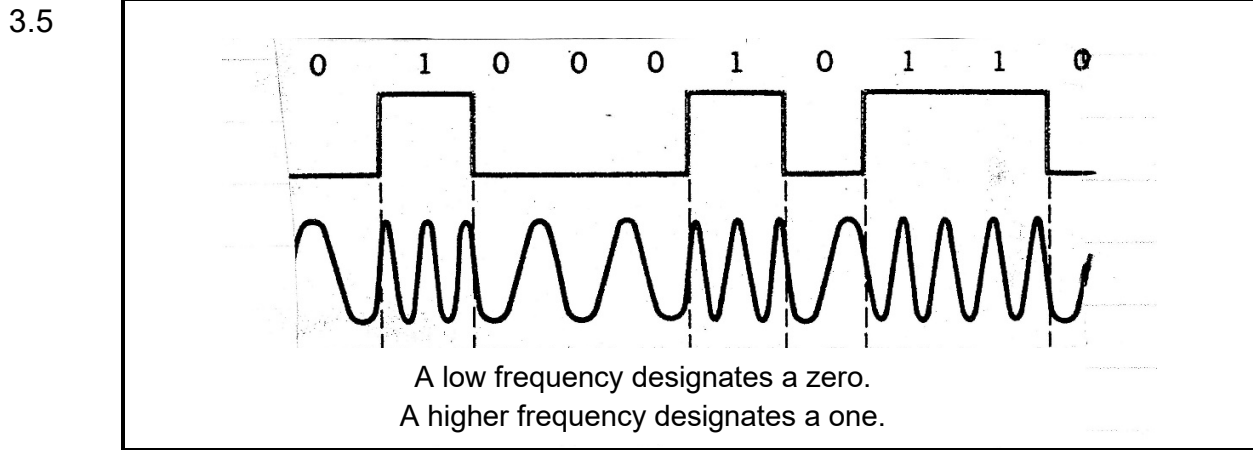
[12]

QUESTION 3

- 3.1
- Data selection
 - Data routing
 - Operation sequencing
 - Parallel-to-serial conversion
 - Waveform generation
 - Logic function generation
- (Any 3 × 1) (3)
- 3.2 Pulse distribution (1)



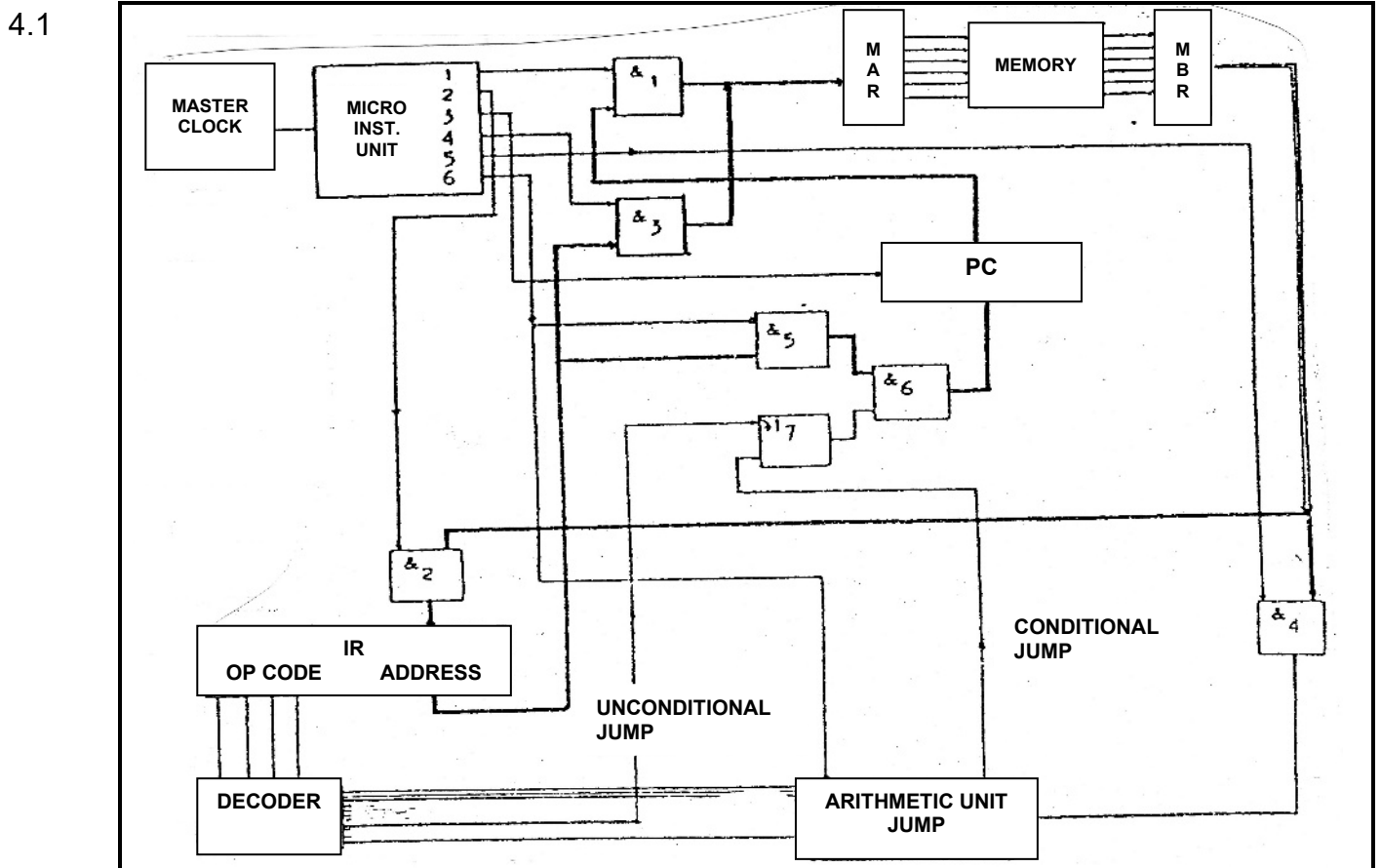
- 3.4
- Transmit side – changes the high-frequency signals from a digital device into frequency shift keying for transmission across the telephone wires.
 - Receive side – changes the frequency shift keying audio tones from the telephone wires into high-frequency signals for the digital device.
- (2)



(NOTE: Any wave train can be drawn as long as the frequencies on the 1 are visibly higher than the frequencies on the 0 and these frequencies must show constant amplitudes throughout.)

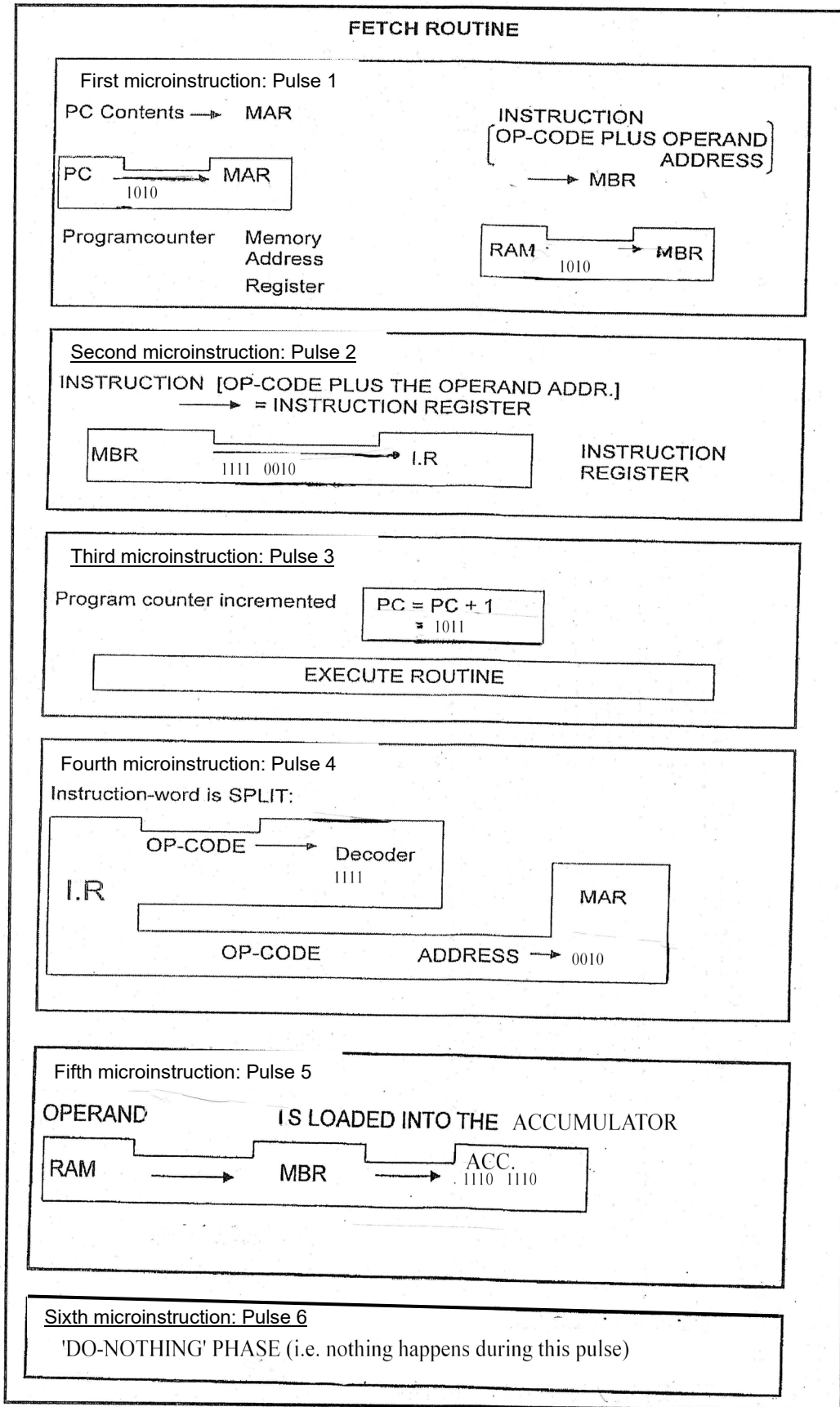
(3)
[13]

QUESTION 4



(10)

4.2



(10)
[20]

QUESTION 5

5.1

PASS	MONTY	PYTHON	ANSWER
0	8	12	20
	16		
- - - - -	- - - - -	- - - - -	- - - - -
1			28
	24		
- - - - -	- - - - -	- - - - -	- - - - -
2			36
	32		

36
32
12

NOTE:

- The column 'PASS' can start on 1 and not 0.
- Each correct row (the dashed lines do not have to be included) is worth 1 marks – no half marks. Mistakes must not be followed through. (6 × 1) (6)
- The final printout below the table must be in the correct order, one below the other for 1 mark. (1)

5.2

- The cost of a new system or expansion of the existing system
 - Hiring of additional an specialised personnel
 - Training of personnel
 - Advantages and benefits that can be derived from the proposed system
 - Environmental considerations
 - Problem areas as well as possible solutions
 - Commissioning and installation
 - Service and backup facilities
 - Data files and format requirements at both input and output terminals
 - Future expansion and estimated lifetime of the system (Any 5 × 1) (5)
- [12]**

QUESTION 66.1 $1_1 0_2 1_3 0_4 1_5 1_6 1_7 0_8 1_9 1_{10}$

Pos. 1 checks 3; 5; 7; 9

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

Pos. 2 checks 3; 6; 7; 10

 $1\ 1\ 1\ 0$ – P2 should thus be 1: 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

 $1\ 1$ – P8 should thus be 0: IT IS thus: 0 ✓✓Thus the fault lies on bit $0101_2 = 5_{10}$ ✓

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

i.e. the word should be: **1010011011**hamming ✓

(10)

6.2 $+0,00110000 \times 10^{+100}$ ✓ $= 11_2$ ✓ $= 2 + 1 = 3_{10}$ ✓

(3)

[13]

TOTAL SECTION B:	70
GRAND TOTAL:	100