



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

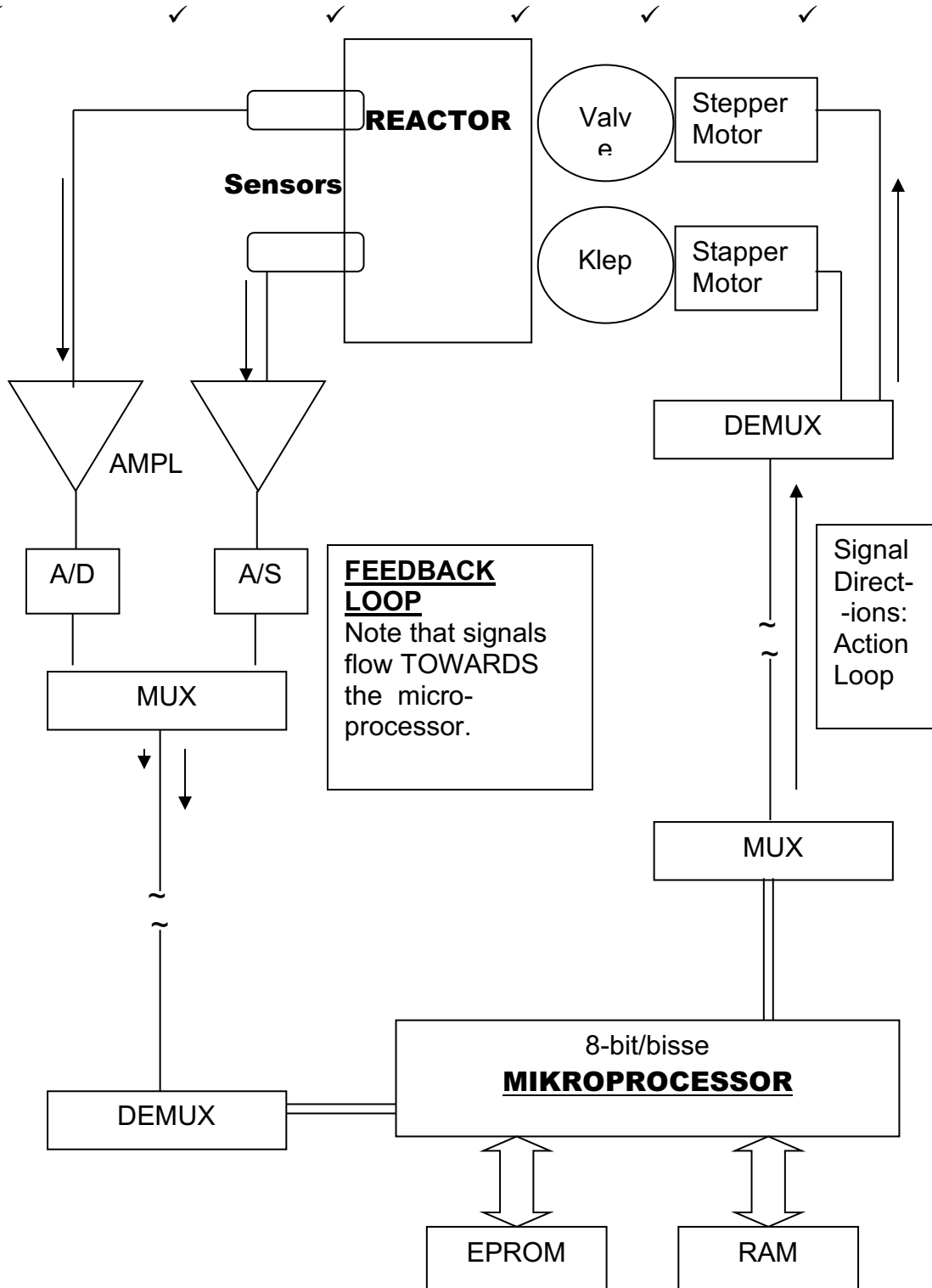
**NATIONAL CERTIFICATE
APRIL EXAMINATION
DIGITAL ELECTRONICS N6**

11 APRIL 2016

This marking guideline consists of 9 pages.

QUESTION 1

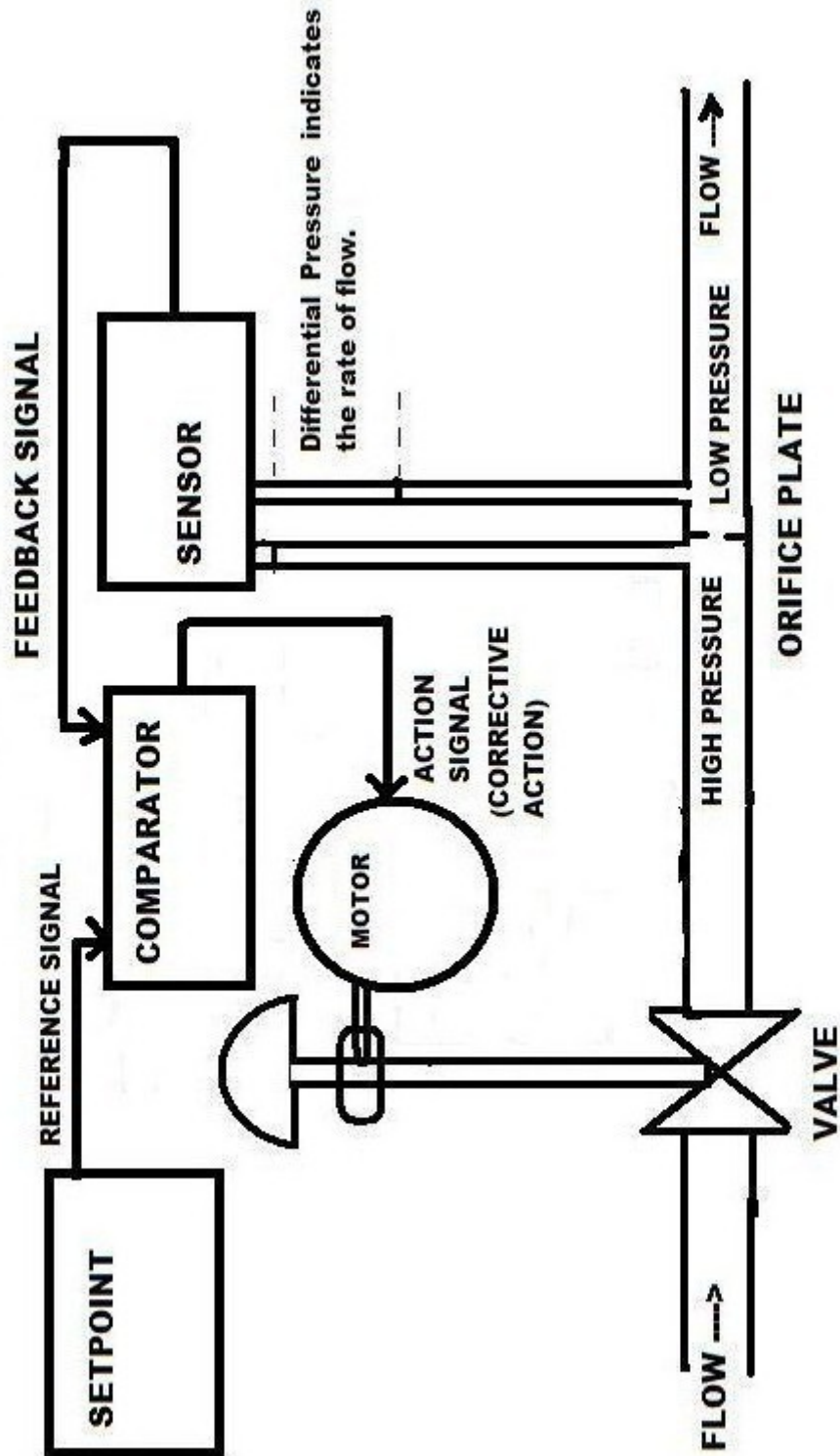
1.1 **REACTOR PROCESS CONTROL**



✓ ✓ ✓

(10)

1.2 CLOSED-LOOP CONTROL SYSTEM: BLOCK DIAGRAM



✓

✓

✓

✓ ✓

✓ ✓

✓

(10)
[20]

QUESTION 2

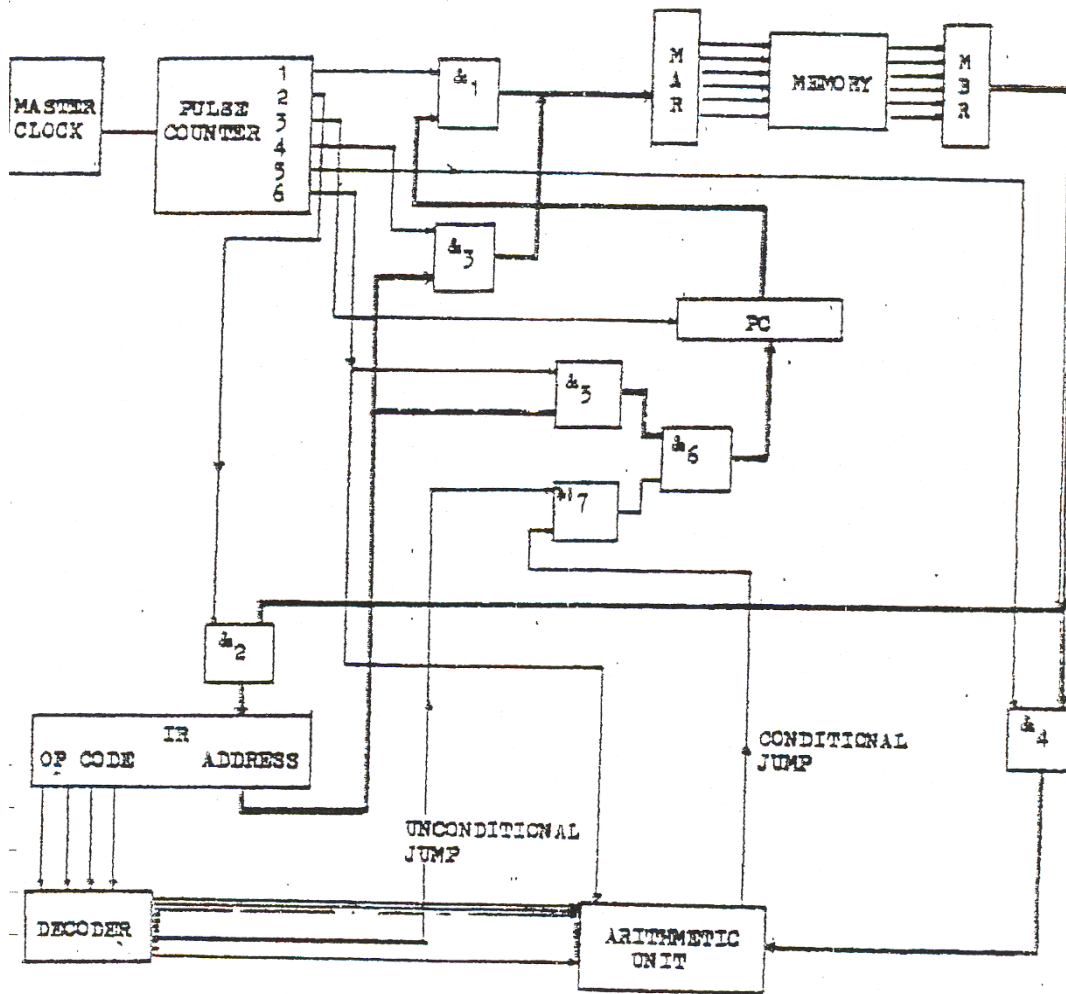
2.1 BELOW IS THE FINAL PRINT-OUT FOR TODAY'S PROGRAM
FULL MARKS FOR CORRECT PRINT-OUT!
ALL THE BEST FOR YOUR EXAMINATIONS!

DEPEND ON PROFESSIONAL WORK

(10)

2.2 CONTROL UNIT

✓ ✓ ✓ ✓ ✓ ✓



(10)
[20]

✓ ✓ ✓ ✓ ✓ ✓ ✓

QUESTION3

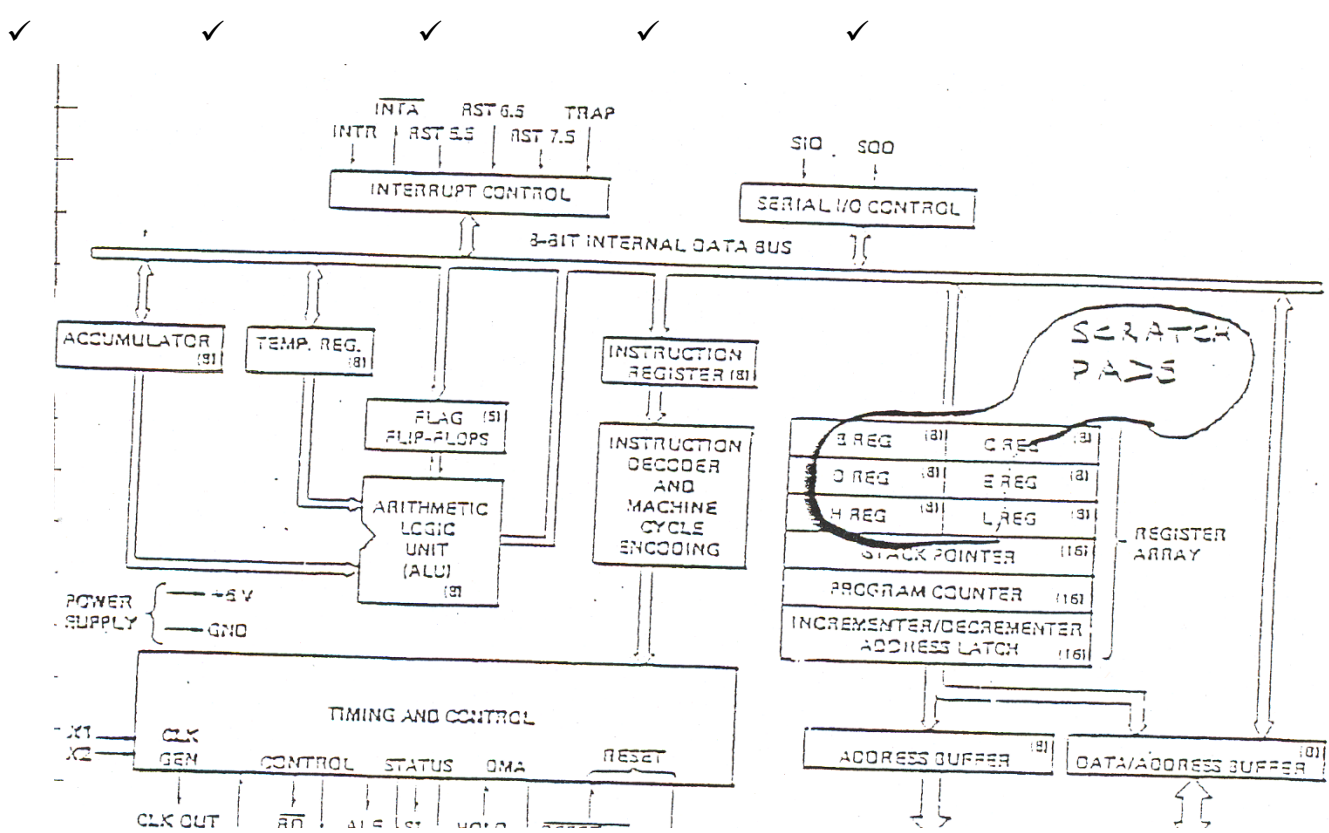
3.1 **GRAPHICAL FORMAT : NRZ PCM :**

	✓	✓	✓	✓	✓	
ASCII	<u>PACKET</u> 0110001	<u>PACKET</u> 0110010	<u>PACKET</u> 0110011	<u>PACKET</u> 0110100	<u>PACKET</u> 0110101	ASCII
VALUES	7	7	7	7	7	VALUES
"1" →						NRZ PCM UNIPOLAR BINARY FORMAT
"0" →						
	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	

(5)

3.2 **BLOCK DIAGRAM: MICROPROCESSOR: INTEL 8085A CPU**

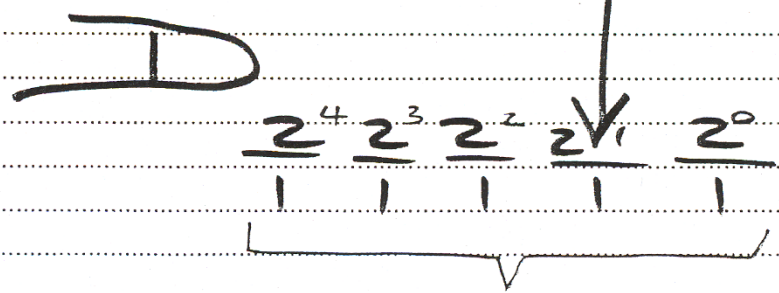
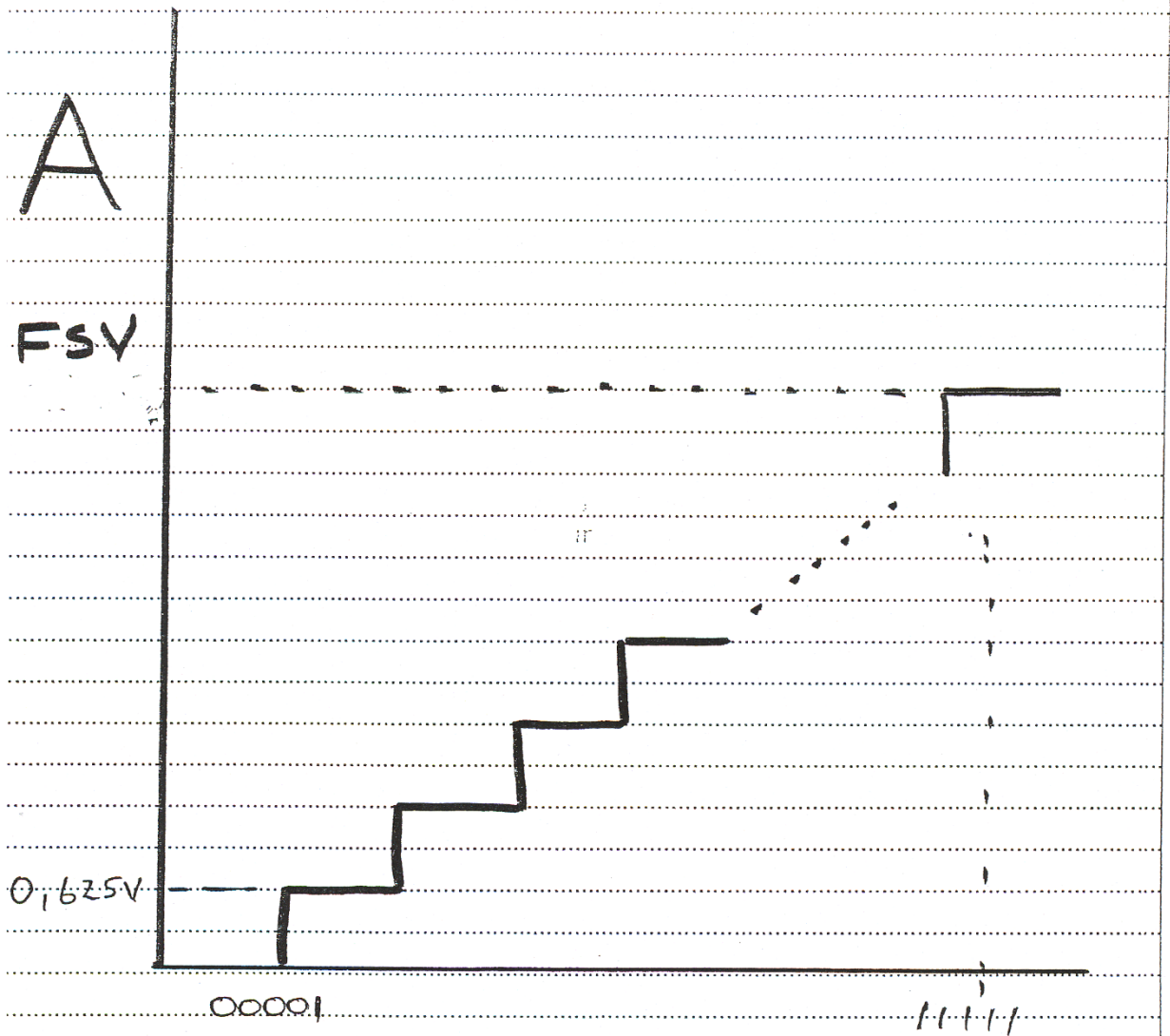
INTEL 8085A CPU:MANUFACTURER:
INTEL CORPORATION✓



Manufacturer: INTEL CORP.

(10)

4.2 DIGITAL TO ANALOGUE CONVERSION



DIGITAL
INPUT

1 1 1 1 1₂

31 x 0,625V



OUTPUT
(FSV)

19,375V

✓

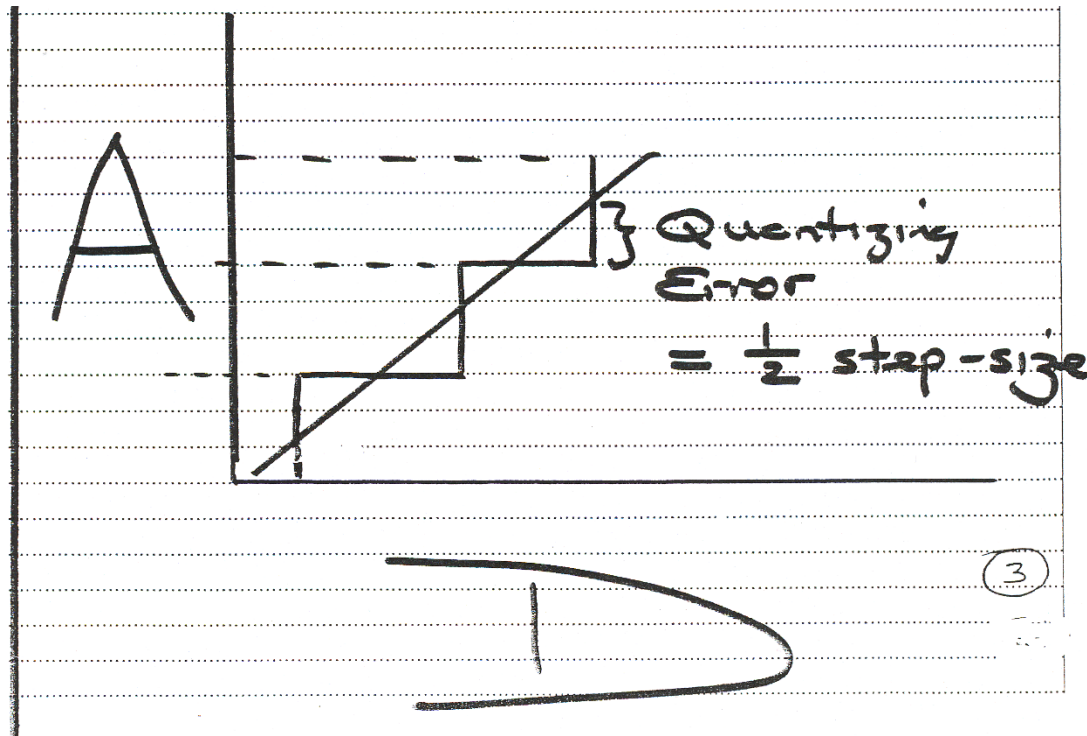
✓

✓✓✓

(4)

4.3 Quantising error: As shown on the sketch below the quantising error of a D/A converter (an ideal D/A converter where other errors are assumed to be zero) cannot be less than half the resolution (i.e. half the step-size of the converter).

The reason is that the converter switches the output in discrete steps at the half-way mark on each step. ✓

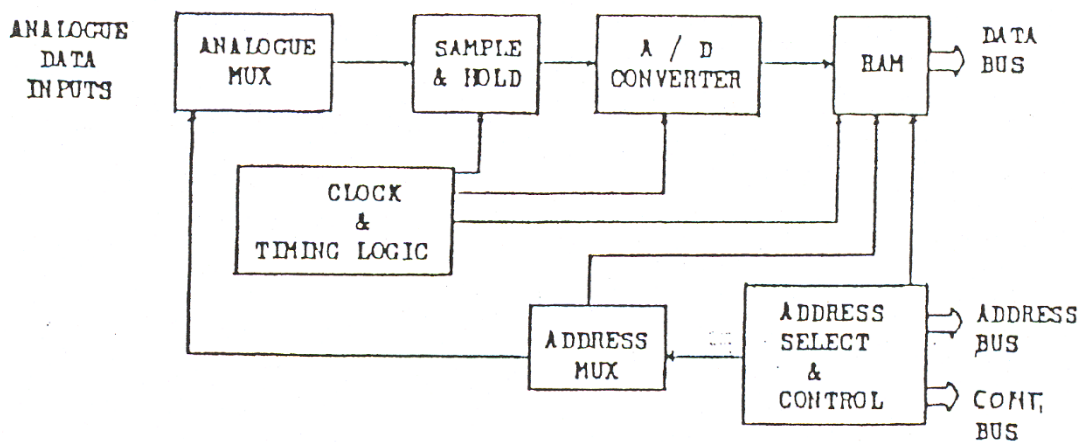


✓

✓

(3)

4.4 **Most efficient manner of data acquisition: Autonomous load into RAM**



✓✓

✓

✓

(4)

- 4.5 Once this is accomplished data can be accessed from RAM using a programming instruction for obtaining data from memory. This is obviously the simplest way to access the data: You just have to know how to program and to use instructions like **LOAD**. ✓✓

(2)
[20]**QUESTION 5**

- 5.1 FALSE
The most efficient method of data acquisition is to have a system which gets numeric data into RAM.
- 5.2 TRUE
Working on tempered steel is a great advantage of CNC spark erosion machining. The X and Y coordinates are accurate to within microns.
- 5.3 FALSE
ATM's are DIGITALLY controlled by a computer. When you make a withdrawal at an ATM a computer controls the process which checks your account balance and authorises the ATM to deliver the cash to you.
- 5.4 FALSE
A feasibility study should not be highly technical or very detailed: Accountants are not engineers and the report must be understandable to them and to other decision makers whose backgrounds are not technical.
- 5.5 TRUE
Cellular telephone networks are run by digital computers.
- 5.6 FALSE
The computer switches you to the cell with the STRONGEST signal.
- 5.7 TRUE
These frequencies are the TONES on the modem.
- 5.8 TRUE
PCM can transmit alphanumeric data: LETTERS **AND** NUMBERS.
- 5.9 FALSE
Hamming code is a DIGITAL code. It uses the BINARY number system.
- 5.10 TRUE
A parallel network will be an 'OR' in Statement List

(10 x 2) [20]

TOTAL: 100