



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MEDICAL ENGINEERING
UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING
EEE 4332: **DIGITAL ELECTRONICS II.**
END OF SEMESTER EXAMINATION
SERIES: APRIL 2025.
TIME: 2 HOURS.
DATE: APRIL 2025.

Instructions to Candidates

You should have the following for this examination

Answer Booklet, examination pass and student ID.

This paper consists of FIVE questions. Answer Question one and any other two.

Do not write on the question paper.

Question ONE.

(a)(i). Explain the need for memories in computer operations, hence differentiate between primary and secondary memories.

(ii). State the need for a backup memory in a computer system hence explain the function of the following memory signals.

(I). Write Cycle Time. (II). Read Cycle Time. **(10 Marks).**

(b)(i). Explain the functions of analogue to digital converter (ADC).

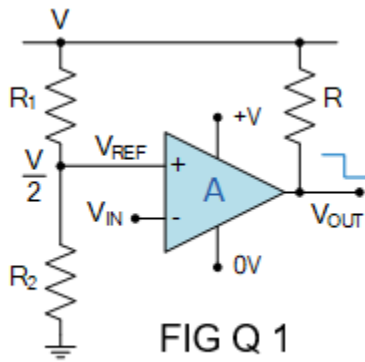
(ii). State any two merits of analogue to digital converter.

(iii). Identify the circuit of figure Q1 and explain how it operates. **(10 Marks).**

(c)(i). Differentiate between unipolar and bipolar families, hence state any two advantages of unipolar compared to bipolar families.

(ii). Draw a two input DTL AND GATE and explain its operation.

(iii). Define noise margin and explain how it affects the operation of a logic gate. **(10 Marks).**



Question TWO

(a)(i). Differentiate between combinational and sequential circuits.

(ii). Define a logic family hence differentiate between TTL and DTL families.

(iii). State any two advantages of TTL families over DTL.

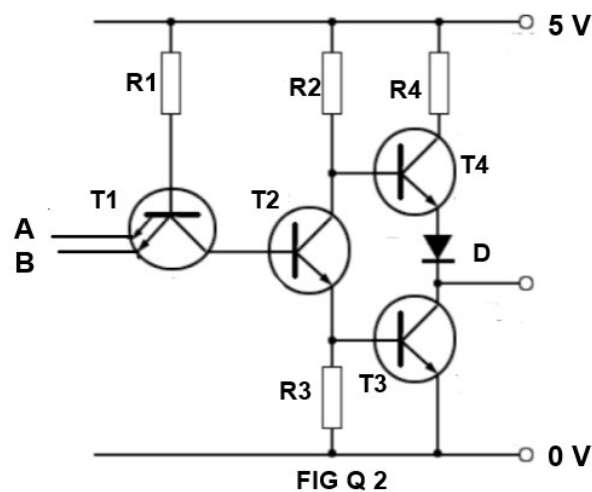
(9 Marks).

(b)(i). Explain the meaning of the following terms as used with logic gates.

(I). Logic level. (II). Propagation Delay

(ii). Identify the circuit of figure Q 2 and by using truth table, explain its operation.

(11 Marks).



Question THREE

(a) (i). Explain the meaning of a computer memory hence differentiate between a ROM and a CACHE memory.

(ii). State any two advantages and disadvantages of a cache memory.

(iii). Name any two properties of the following memory types.

(I). Volatile Memory. (II). Random Access Memory.

(8 Marks)

(b)(i). Define an electronic memory cell.

(ii). With the aid of a basic diagram, draw and explain the operation of a Resistor- Capacitor electronic memory cell.

(iii). Draw a 4 x 4 cell memory array and explain its operation.

(12 Marks).

Question FOUR

(a)(i). Define an analogue to digital converter system, hence explain the meaning of the following terms as related to the converter.

(I). Sampling (II). Encoding

(ii). State any two types and any two applications of analogue to digital converters. **(12 Marks).**

(b)(i). Explain the operational difference between a comparator and a priority encoder in analogue to digital converter.

(ii). Identify the circuit of figure Q 4 and explain its operation.

(8 Marks).

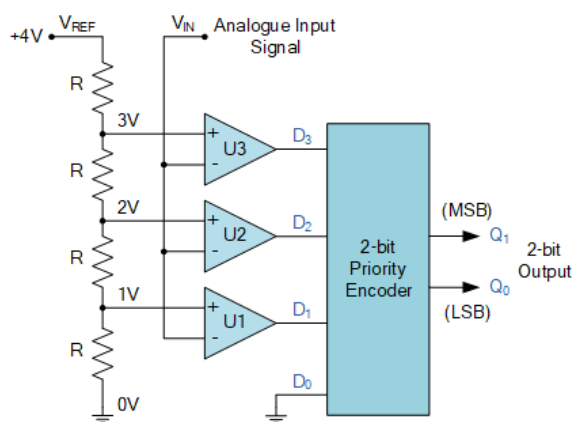


Fig Q 4

Question FIVE

(a)(i). Differentiate between analogue and digital measuring instruments.

(ii). Explain the following properties of a digital voltmeter.

(I). Sensitivity. (II). Precision.

(iii). Name any two types of digital voltmeters.

(8 Marks).

(b)(i). Explain how the operation of an analogue display differs from that of digital type.

(ii). Draw a block diagram of a digital voltmeter and explain the function of each block.

(ii). State any two disadvantages of analogue meters compared to digital types. **(12 Marks).**