



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF MEDICAL ENGINEERING
UNIVERSITY EXAMINATION FOR:
BACHELOR OF TECHNOLOGY IN ELECTRICAL ENGINEERING
TEE 4333: **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 Any Three Questions.

Do not write on the question paper.

Question ONE.

(a)(i). Differentiate between analogue and digital signals. Use wave forms to explain your answer.

(ii). Explain the significance of analogue to digital converter (ADC).

(iii). A simple circuit is made of a $5k\Omega$ linear resistor connected to a 5V power supply. Draw and explain how the circuit can be modified to produce

(I). Continuous output. (II). 5 output voltage levels changing in step forms. **(11 Marks).**

(b)(i). State any two applications of shift registers.

(ii). Draw a three bit serial out shift register and explain how it can store a three bit, (101) word.

(iii). State one disadvantage of the circuit. **(9 Marks).**

Question TWO

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

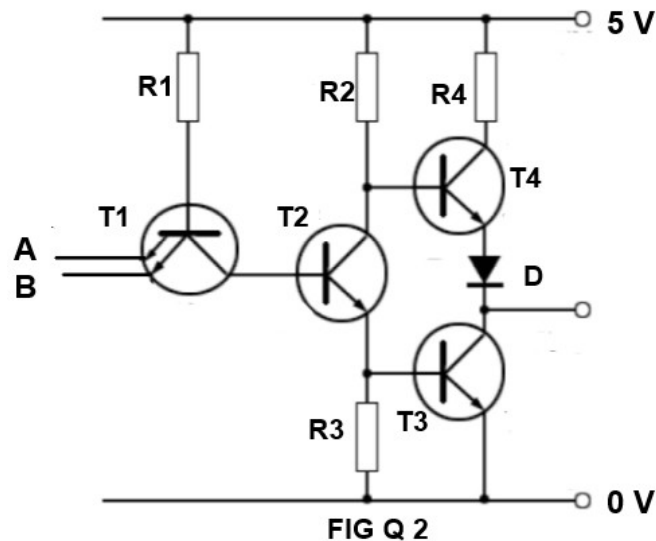
(ii). Define a logic family hence differentiate between TTL and DTL families.

(iii). State any two advantages of TTL families over DTL. **(9 Marks).**

(b)(i). Explain the meaning of the following terms as used with switching circuits.

(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). NON-VOLATILE 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).**

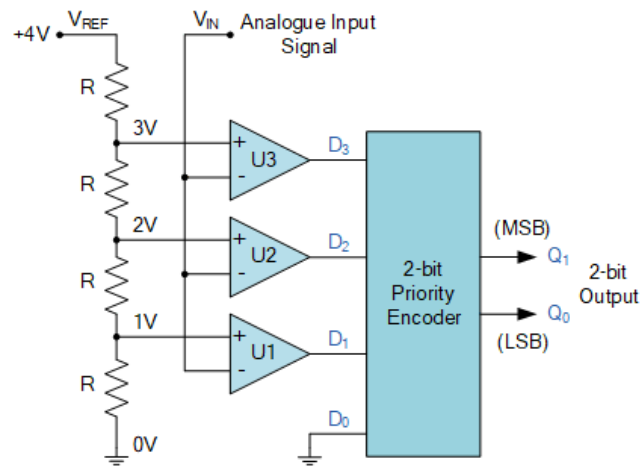


Fig Q 4

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).