Kaferelsheikh University
Faculty of Engineering
Department of Electrical Engineering
Year: 3rd communication
Subject: Electronic Measurements & Testing (1), ECE3006
Name:

Date: 17/ 6 /2021
Time allowed: 3h
Full Mark: 85 degree
Final Exam: 2 page
Academic Number

This course must be ableto satisfy the GENERAL competencies for all engineering programs (level A):A2, the competencies of basic electrical engineering discipline(level B):B3, B4 and the electronic and communication engineering competencies(level C):C1,C2.

Answer the following questions:

[1] Question One: (20 Mark)

a- i) Analyze the electronic circuit of R/2R ladder D/A converter to find the relation between analog outputs and their corresponding digital inputs (5-marks)

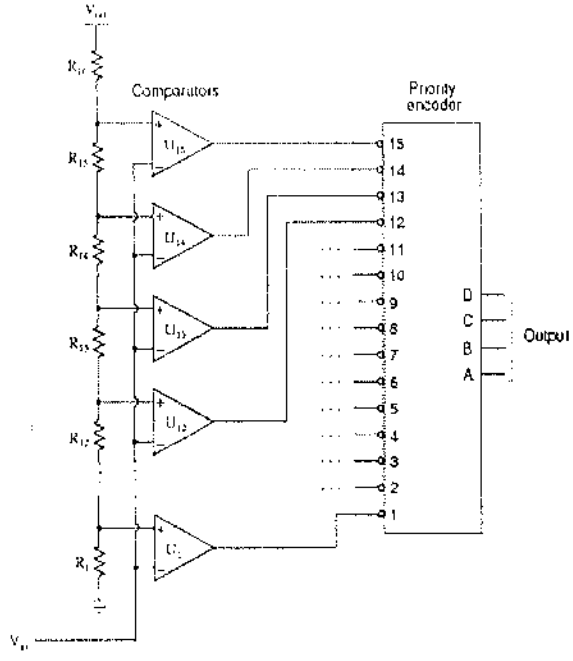
ii) A 4-bit R/2R digital-to-analog (DAC) converter has a reference of 5 volts. What is the analog output for the input code 0101. (5-marks)

i) A binary-weighted digital-to-analog converter has a feedback resistor, R_f, of 12 kΩ. If 50 μA of current is through the resistor, determine the output voltage of the circuit (5-marks)

ii) What is the major advantage of the R/2R ladder digital-to-analog (DAC), as compared to a binary-weighted digital-to-analog DAC converter? (5-marks)

[2] Question Two: (8Mark)

a- Predict how the operation of this "flash" analog-to-digital converter (ADC) circuit will be affected as a result of the following faults. Consider each fault independently (i.e. one at a time, no multiple faults):



With best wishes **Committee of Correctors and Testers** Dr. Noha abd-al salam Dr. shamyaa ghamry

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i) Resistor R_{16} fails open ii) Resistor R_1 fails open iii) Comparator U_{13} output fails low. For each of these conditions, explain *why* the resulting effects will occur.

[3] Question three: (17 Mark)

a-draw a block diagram of PCM, specifying the function of each part and the conditions required for correct signal recovery at the receiver (9-marks)

b-Delta modulation is special case of Differential PCM where each sample is represented by just 1 bit, **explain**. (8-marks)

[4] Question four: (20 Mark)

a- **Design and explain** a voltage regulator circuit with protection diodes. Explain the type of regulator is used. (10-marks)

b- **Explain the operation** of the circuit shown in Fig. 2, then get the regulated output voltage results in the circuit. (10-marks)

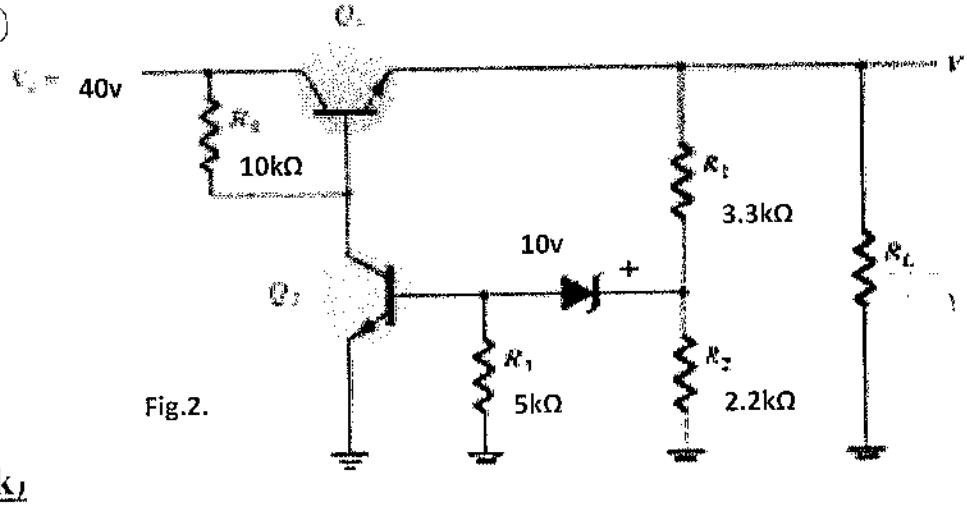

Fig.2.

[5] Question four: (20 Mark)

a-Explain the main idea of your project, with clarifying the following: (5-marks)

- **The objectives** of the project. (2-marks)
- **Sketch** the circuit diagram of the project with explain the function of each component in the circuit. (8-marks)
- **Explain** the operation of the project circuit. (5-marks)

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