

MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

## SIXTH SEMESTER B.TECH. (E & C) DEGREE END SEMESTER EXAMINATION -JUNE 2019 SUBJECT: ELECTRONIC SYSTEM DESIGN (ECE - 4023)

## TIME: 3 HOURS

MAX. MARKS: 50

- Instructions to candidatesAnswer ALL questions.
  - Missing data may be suitably assumed.
- 1A. Discuss in detail the data acquisition system and explain input and output multiplexing with sample and hold gates.
- 1B. Draw neat Ishikawa diagram for reduced quality and efficiency of electronic devices. Suggest recommendations to resolve this problem

(5+5)

- 2A. Explain any two fundamental noise mechanisms and draw the noise model for any two circuit elements with relevant equations.
- 2B. Design a RLC circuit shown in **Fig. 2B** to select the 1000 KHz frequency of AM radio with a bandwidth of 5 KHz and implement using OTA-C approach.



Fig. 2B

2C. What are the main precautions taken by the quality control department in an electronic product development.

(4+3+3)

- 3A. Explain any two commonly used cooling mechanisms in electronic system design.
- 3B. A square mask opening is used to create a cavity in a silicon wafer. Suppose the thickness of the wafer is 500 $\mu$ m and the window opening is 1mm on each side. The etch rate on <100> surface is 2 $\mu$ m/min. Ignoring the etch rate on <111> surface, calculate the size of opening on the backside of the wafer. What would be the thickness of the wafer if is desired to form a blind cavity with an inverted point instead.

(5+5)

4A. With neat flow diagram explain the major steps involved in the production of a single -sided Printed Circuit Board.

- 4B. With neat diagram working of first order sigma delta modulator and implement it using switched capacitor circuits.
- 4C. Compare Surface Mount Techniques with Through-hole techniques.

(4+3+3)

- 5A. Explain different types of soldering in details along with precautions to be taken in handling components during assembly and testing.
- 5B. Compare Linear voltage regulator with switched mode voltage regulators. What are the advantages of switched mode regulators over linear regulators?
- 5C. Discuss different configurations of connecting HB LED.

(4+3+3)

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