U.S.N.										

B. M. S. College of Engineering, Bengaluru - 560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: III**
Branch: Electronics and Communication Engineering **Duration: 3 hrs.**
Course Code: 19EC3DCMSA **Max Marks: 100**
Course: Modern Sensors and its Applications **Date: 22.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
Revealing of identification, appeal to evaluator will be treated as malpractice.

SUPPLEMENTARY EXAMS 2023

UNIT - I

1. a) Illustrate the role of calibration of the sensors and examine how calibration is performed with relevant expression. **08**

   b) Discuss the impact of environmental factors upon the functioning of a sensor. **12**

UNIT - II

2. a) Explain piezoelectric principle with relevant properties. Illustrate how the thermal poling method gives a crystalline material to piezoelectric properties. Discuss some unique properties of piezoelectric films. **10**

   b) Explain working principle of a Pyroelectric Sensor. Indicate the response of a Pyroelectric Sensor to a thermal step function and explain why the magnitude of charge Qo and voltage Vo does not drop to zero completely. **10**

UNIT - III

3. a) Explain mercury filled U shaped pressure sensor for measuring gas pressure. **10**

   b) Describe the operation of LVDT for measuring displacement with necessary diagrams. Give the advantages and applications of LVDT. **10**

OR

4. a) Select and analyze a suitable sensor required for Direct acoustic measurements in hostile environments, such as in turbojets or rocket engines, which can withstand high heat and strong vibrations. **10**

   b) In detail, explain the working of Chilled-mirror dew-point sensor with an optical bridge. **10**

UNIT - IV

5.	a)	Define thermistor. Describe any two computational models of NTC thermistors.	**10**
	b)	Describe the working principle of semiconductor-PN junction sensors.	**10**

OR

6.	a)	Write a short note on RTD sensors.	**10**
	b)	State and explain three different laws of thermocouples with relevant diagram.	**10**

UNIT - V

7.	a)	Describe the Photo Lithography process used in microelectronics industry.	**10**
	b)	Explain different materials used for sensor fabrication.	**10**

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SUPPLEMENTARY EXAMS 2023