

University of Mumbai

Examinations: Summer 2022

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	These transducers do not need any external source of power for their operation.
Option A:	Passive Transducers
Option B:	Active Transducers
Option C:	Both A and B
Option D:	Capacitive Transducers
2.	In a capacitive type sensor, the capacitance is dependent upon _____
Option A:	inter-electrode separation distance (gap)
Option B:	area of overlap of the electrodes
Option C:	the permittivity of free space
Option D:	All of the above
3.	----- is based on the infrared light source, which is used to calculate the return light of the source after striking an object.
Option A:	Ultrasonic sensor
Option B:	Proximity sensor
Option C:	Gas sensor
Option D:	Pressure sensor
4.	What are the components of MEMS?
Option A:	Sensor, Actuator, Microelectronics, Microstructure
Option B:	Transducer, Actuator, Microelectronics
Option C:	Sensor, Transducer, Microstructure
Option D:	Sensor, transducer, Actuator
5.	Multichannel data acquisition system has
Option A:	multiple channels
Option B:	single channel
Option C:	two channels
Option D:	five channels
6.	Bluetooth is the wireless technology for.
Option A:	local area network
Option B:	personal area network
Option C:	Wide area network
Option D:	Metropolitan area network

7.	A multiplexer is used for _____.
Option A:	accepting multiple inputs
Option B:	accepting single input
Option C:	accepting multiple outputs
Option D:	accepting single output
8.	Which condition is referred to as the balanced condition of the bridge?
Option A:	When the centre Galvanometer detects highest current flow
Option B:	When the centre Galvanometer detects constant current flow
Option C:	When the centre Galvanometer detects no current flow
Option D:	When the centre Galvanometer gets damaged
9.	Which of the following types of RFID tags have a battery?
Option A:	Passive
Option B:	Active
Option C:	Semi passive
Option D:	Inlays
10. converts biochemical events into measurable signals
Option A:	amplifier
Option B:	opamp
Option C:	rectifier
Option D:	transducer

Q2	
A	Solve any Two 5 marks each
i.	<i>Distinguish between Analog and Digital sensors based on signal representation, B.W., Noise immunity, memory, and applications.</i>
ii.	<i>Explain the need of a temperature sensor and its applications.</i>
iii.	<i>Illustrate the working principle and applications of Thermistor..</i>
B	Solve any One 10 marks each
i.	<i>Categorize RTD, thermocouple and thermistor.</i>
ii.	<i>Explain different Gas Sensing Technologies and discuss two types of Gas sensors.</i>

Q3	
A	Solve any Two 5 marks each
i.	<i>Explain the working principle of UWB. What are the advantages of UWB?</i>
ii.	<i>Discuss Need for signal conditioning with suitable examples.</i>
iii.	<i>Describe WLAN equipments</i>
B	Solve any One 10 marks each
i.	<i>Explain in detail Taguchi Gas sensor.</i>
ii.	<i>Describe working of 3-bit Flash ADC with a block diagram.</i>

Q4.	
A	Solve any Two 5 marks each
i.	<i>Describe Data loggers with its Block Diagram</i>
ii.	<i>Explain different topologies of ZigBee.</i>
iii.	<i>Describe working of Wheatstone bridge for signal conditioning.</i>
B	Solve any One 10 marks each
i.	<i>Explain block diagram and working of any one home appliance sensor.</i>
ii.	<i>Discuss network connection establishment in BT</i>