

Subject Code: XXXXX

Roll No:

--	--	--	--	--	--	--	--	--	--

BTECH
(SEM-5) SENSORS AND TRANSDUCERS 2021-22

TIME:3 HOUR

Total Marks: 100

Instruction: Attempt the questions as per the given instructions. Assume missing data suitably.

SECTION - A

Attempt *All Parts* in Brief

2*10 = 20

Q1	Questions	Marks
(a)	Describe the functioning of LVDT.	2
(b)	Define piezoelectric sensors.	2
(c)	How can you say that proximity sensors are indispensable in industrial applications?	2
(d)	What are RTDs?	2
(e)	Charge coupled device: Explain.	2
(f)	How complementary metal-oxide semiconductor type of imaging sensors work ?	2
(g)	Which type of ADC is widely used ? Why?	2
(h)	What is the role of timers in data acquisition systems ?	2
(i)	What is self-calibration in smart sensors ?	2
(j)	How smart sensors are self-testing and self-communicating ?	2

SECTION - B

Attempt Any Three of the following

3*10 = 30

Q2	Questions	Marks
(a)	What are the benefits of measurement of displacement using potentiometer ? Give a detailed report.	10
(b)	Discuss vibration sensors with respect to their methodology of working.	10
(c)	Write short notes on advantages of machine vision.	10
(d)	Discuss types of amplifiers with respect to their amplification parameter.	10
(e)	What are the strategies for industrial robots' adaptation in smart sensor applications?	10

SECTION - C

Attempt Any One of the following

5*10 = 50

Q3	Questions	Marks
(a)	Explain measurement of pressure using LVDT based diaphragm and piezoelectric sensor with suitable diagrams.	10
(b)	Measurement of force using strain gauges and load cells. Discuss.	10
Q4	Questions	Marks
(a)	What is the necessity of thermal imaging? Explain	10
(b)	Discuss the working principle and applications of Hall effect sensors. Can the output from the Hall effect sensor be in analog and digital form ? How?	10
Q5	Questions	Marks
(a)	Explore training the vision system in a pick and place robot.	10
(b)	Sensing and digitizing function in machine vision. Give a detailed insight.	10
Q6	Questions	Marks
(a)	What are the functions of signal conditioning equipment? Explain in detail.	10
(b)	Explain the elements of data acquisition systems and conversion.	10
Q7	Questions	Marks
(a)	What are smart sensors? Discuss in detail electric vehicles.	10

(b)

Discuss the development of smart city using smart sensors.

10