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Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - THEORY EXAMINATION (2024- 2025)

Subject: Sensor and Its Applications

Time: 3 Hours Max. Marks: 100

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A 20

1. Attempt all parts:-

1-c. _____is composed of several thermocouples connected usually in series or, less commonly, in parallel. (CO2, K1) 1

(a) RTD

(b) Thermistor

(c) Thermocouple

(d) Thermopile

1-a. Gyroscope is also known as____ (CO1, K1) 1

(a) Angular Velocity Sensors

(b) Angular Rate Sensors

(c) Both

(d) None

1-d. In thermal imaging , _____color for objects indicates hot temperature. (CO2, K1) 1

(a) Black

(b) White

(c) Grey

(d) None

1-b. _____ is a recording aneroid barometer where the changes in atmospheric pressure are recorded on a paper chart. (CO1, K1) 1

(a) Barograph
(b) Chart
(c) Graph
(d) None

1-e. A For Loop is different from a While Loop because it runs for a set number of iterations and does not require a . The number of iterations is set by the (CO3, K2) 1

(a) Input Tunnel, Count Terminal
(b) Conditional Terminal, Iteration Terminal
(c) Conditional Terminal, Count Terminal
(d) Input Tunnel, Count Tunnel

1-f. The data structure can be compared to a purse or wallet because a purse or wallet can hold many different things just as this data structure can hold multiple data types. (CO3, K1) 1

(a) Array
(b) Cluster
(c) Bundle
(d) Container

1-g. The time required to complete the conversion of Analog to Digital is _____ the duration of the hold mode of S/H. (CO4, K1) 1

(a) Greater than
(b) Less than
(c) Equal to
(d) Greater than or equal to

1-h. Which A/D converter is considered to be simplest, fastest and most expensive? (CO4, K1) 1

(a) Servo converter
(b) Counter type ADC
(c) Flash type ADC
(d) All of the mentioned

1-i. On what principle does the braking system in the car work? (CO5, K1) 1

(a) Frictional Force
(b) Gravitational Force
(c) Magnetic Force
(d) Electric Force

1-j. _____ handle mathematical operations necessary to deliver the output signal. (CO5, K1) 1

(a) Small Sensors
(b) Mat Sensors

(c) Soft Sensors

(d) Super Sensors

2. Attempt all parts:-

2.a.	What are the functions of magnetic field sensor? (CO1, K1)	2
2.b.	List out the applications of accelerometer. (CO2, K1)	2
2.c.	What is the analogy of clusters in C or in Pascal? (CO3, K1)	2
2.d.	What is Socket and socket address? (CO4, K1)	2
2.e.	What do you mean by signal conditioner and processing unit? (CO5, K1)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Discuss the advantages and disadvantages of sound sensor with its operations and applications. (CO1, K2)	6
3-b.	Draw and explain the electrical circuit diagrams of a LVDT when core is moving to left, right and at null position. (CO1, K2)	6
3-c.	Describe the Capacitive proximity sensor with its applications. (CO2, K2)	6
3-d.	Discuss the applications of Proximity sensor as accelerometer and Vibration sensor. (CO2, K2)	6
3.e.	What is sequence structure? Explain in brief. (CO3, K1)	6
3.f.	What is network communication? State the use of data sockets in networked communication with their advantages and limitations. (CO4, K2)	6
3.g.	Draw and explain the design process of sensor and sensor system . (CO5, K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	What do you mean by pressure sensor and temperature sensor? Explain them in detail. (CO1, K2)	10
4-b.	Describe pH sensor with its classification, advantages and disadvantages. (CO1, K2)	10

5. Answer any one of the following:-

5-a.	Explain level sensor with diagram? What are the different types of Level Sensor with its various applications.(CO2, K2)	10
5-b.	Explain the working of Hall effect sensor for position measurement. (CO2, K2)	10

6. Answer any one of the following:-

6-a.	What is auto indexing? State the default auto index of FOR and WHILE Loops. (CO3, K2)	10
6-b.	Name the three parts of LabVIEW. Explain them in detail. (CO3, K2)	10

7. Answer any one of the following:-

7-a.	Explain the Direct type and Indirect type ADC in detail. (CO4, K2)	10

7-b.	Describe the working & construction of weighted resistor type DAC. Also explain the advantages and applications. (CO4, K2)	10

8. Answer any <u>one</u> of the following:-

8-a.	What are the programming devices? Explain the uses of these devices for smart sensors? (CO5, K2)	10
8-b.	Define Signal conditioning and processing unit. Also explain Amplification, Filtering, Sampling, Modulation and Excitation. (CO5, K1)	10