**20EI305**

**Hall Ticket Number:**

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| **II/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **March, 2022** | **Electronics and Instrumentation Engineering** | | |
| **Third Semester** | **Transducers** | | |
| **Time:** Three Hours | | **Maximum:7**0 Marks | |
| *Answer Question No.1 compulsorily.* | | | (14X1 = 14 Marks) |
| *Answer ONE question from each unit.* | | | (4X14=56 Marks) |

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| Answer all questions | | | | **COS** | **BT** | **Marks** |
| 1. | a) | | What are functions of measurement systems? | CO1 |  |  |
|  | b) | | Write the difference between accuracy and precision. | CO1 |  |  |
|  | c) | | Define Range of an instrument. | CO1 |  |  |
|  | d) | | Draw the curve for Hysteresis effect of an instrument. | CO2 |  |  |
|  | e) | | Write the definition of a transducer. | CO2 |  |  |
|  | f) | | What is inverse transducer? Give example | CO2 |  |  |
|  | g) | | Give any two examples for passive transducers. | CO3 |  |  |
|  | h) | | Mention any two transducers used for measurement of temperature. | CO3 |  |  |
|  | i) | | Expand RVDT. | CO3 |  |  |
|  | j) | | Name the resistive transducer used for measurement of Load. | CO3 |  |  |
|  | k) | | Write various types of capacitive transducers. | CO4 |  |  |
|  | l) | | Write examples for natural piezoelectric crystals. | CO4 |  |  |
|  | m) | | Mention various elements of a Smart Sensor. | CO4 |  |  |
|  | n) | | Write the principle of chemical sensors. | CO4 |  |  |
| **UNIT - I** | | | | | | |
| 2. | a) | Draw the block diagram of a generalized measurement system and explain. | | CO1 |  | 7M |
|  | b) | Explain the following static characteristics of an instrument.  (i) Accuracy (ii) Precision (iii) Resolution | | CO1 |  | 7M |
| **(OR)** | | | | | | |
| 3. | a) | Write about limiting errors and their combinations. | | CO1 |  | 7M |
|  | b) | Derive the expression for step response of first order instrument. | | CO1 |  | 7M |
| **UNIT - II** | | | | | | |
| 4. | a) | Define a transducer and write about the classification of transducers. | | CO2 |  | 7M |
|  | b) | Explain the principle of operation of strain gauge and write its applications. | | CO2 |  | 7M |
| **(OR)** | | | | | | |
| 5. | a) | Explain the operation of LVDT in detail with neat diagrams. | | CO2 |  | 7M |
|  | b) | Explain the operation of RTD and Thermistor with necessary diagrams. | | CO2 |  | 7M |
| **UNIT - III** | | | | | | |
| 6. | a) | Explain variable area and variable dielectric type capacitive transducers. | | CO3 |  | 7M |
|  | b) | Explain variable gap type and differential type capacitive transducers. | | CO3 |  | 7M |
| **(OR)** | | | | | | |
| 7. | a) | What is piezoelectric effect? Write about various materials which exhibit piezoelectric effect. | | CO3 |  | 4M |
|  | b) | Explain the operation of piezoelectric transducer and draw its equivalent circuit. | | CO3 |  | 10M |
| **UNIT - IV** | | | | | | |
| 8. | a) | Draw the block diagram of smart sensor and explain. | | CO4 |  | 7M |
|  | b) | Explain the operation of ultrasonic sensor and write its applications. | | CO4 |  | 7M |
| **(OR)** | | | | | | |
| 9. | a) | Write about IR sensors and their applications. | | CO4 |  | 7M |
|  | b) | Explain measurement of various parameters using Fiber Optic sensors briefly. | | CO4 |  | 7M |

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