**Hall Ticket Number: 20EC202**

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| **I/IV B.Tech REGULAR DEGREE EXAMINATION** | | | |
|  | **Electronics & Communication Engineering** | | |
| **Second Semester** | **Basic Instrumentation** | | |
| **Time:** Three Hours | | **Maximum: 7**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X10=40 Marks) |

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| 1. | a) | Define Accuracy and sensitivity? | CO1 | L1 | | **1M** |
|  | b) | Define Static Error? | CO1 | L1 | | **1M** |
|  | c) | List out the Static characteristics of any measurement system? | CO1 | L1 | | **1M** |
|  | d) | Define Calibration? | CO1 | L1 | | **1M** |
|  | e) | How do you eliminate stray capacitance in ac bridges? | CO2 | L1 | | **1M** |
|  | f) | What are the limitation of Wheatstone bridge? | CO2 | L1 | | **1M** |
|  | g) | List the functional units of a measuring Instrument? | CO2 | L1 | | **1M** |
|  | h) | List the applications of AC bridges? | CO2 | L1 | | **1M** |
|  | i) | What are different controls available on CRO? | CO2 | L1 | | **1M** |
|  | j) | How to find unknown frequency using Lissajous figures? | CO2 | L1 | | **1M** |
|  | k) | Write the relation between Stress and Strain? | CO3 | L1 | | **1M** |
|  | l) | Write various transducers used for displacement measurement? | CO3 | L1 | | **1M** |
|  | m) | Define Primary transducer. | CO4 | L1 | | **1M** |
|  | n) | List the elements of DAQ system? | CO4 | L1 | | **1M** |
| **Unit - I** | | | | | | |
| 2. | a) | Explain in detail about Random errors and methods to estimate them? | CO1 | L1 | **7M** | |
|  | b) | A voltmeter reading 70v on its 120v range and an ammeter reading 50mA on its 140mA range are used to determine the power dissipation of resistor. Both these instruments have guaranteed accuracy of ± 1.4% at full scale deflection. Determine limiting error of the power? | CO1 | L1 | **7M** | |
|  |  | **OR** | | | | |
| 3. | a) | Design an Aryton shunt to provide an ammeter with current ranges 0-2mA,20mA, 5mA, and 80mA, using a D'Arsonval movement having an internal resistance of 200Ω and full scale deflections of 50µA. | CO1 | L1 | **7M** | |
|  | b) | Explain in detail Shunt type ohmmeter? | CO1 | L1 | **7M** | |
| **Unit - II** | | | | | | |
| 4. | a) | Explain the operation of Maxwell’s Bridge and derive the condition for balance of a Bridge. | CO2 | L1 | **7M** | |
|  | b) | Explain how very low resistances are measured using kelvins double bridge. | CO2 | L2 | **7M** | |
|  |  | **OR** |  |  |  | |
| 5. | a) | Explain the principle and operation of true RMS responding volt meter with the help of neat sketch. | CO2 | L1 | **7M** | |
|  | b) | Explain the operation of AC voltmeters using rectifiers. | CO2 | L1 | **7M** | |

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| **Unit - III** | | | | | |
| 6. | a) | Draw the basic block diagram of oscilloscope and explain the function of each block? | CO3 | L1 | **7M** |
|  | b) | Draw the circuit diagram of Sampling oscilloscope and explain its operation in detail | CO3 | L1 | **7M** |
|  |  | **OR** |  |  |  |
| 7. | a) | Explain how frequency and phase are measured using CRO? | CO3 | L1 | **7M** |
|  | b) | Draw the circuit diagram of Storage oscilloscope and explain its operation in detail. | CO3 | L1 | **7M** |
| **Unit - IV** | | | | | |
| 8. | a) | Derive the expression for Gauge factor of a strain Gauge. | CO4 | L2 | **7M** |
|  | b) | With the help of neat sketch explain the working of LVDT and list its advantages and disadvantages. | CO4 | L1 | **7M** |
|  |  | **OR** |  |  |  |
| 9. | a) | Write a note on classification of transducers | CO4 | L1 | **7M** |
|  | b) | Draw the block diagram of data acquisition system and explain the function of each block | CO4 | L1 | **7M** |

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