**20EI403**

**Hall Ticket Number:**

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| **II/IV B.Tech (Regular/Supplementary ) DEGREE EXAMINATION** | | | |
| **July/August,2023** | **Electronics & Instrumentation Engineering** | | |
| **Fourth Semester** | **Electrical and Electronic Measurements** | | |
| **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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| 1. | a) | | Define error. | L1 | CO1 | 1M |
|  | b) | | What is the working principle of Potential transformer? | L1 | CO1 | 1M |
|  | c) | | Define sensitivity of measuring instrument. | L2 | CO1 | 1M |
|  | d) | | What is the working principle of power factor meter? | L2 | CO1 | 1M |
|  | e) | | Draw the Maxwell’s bridge. | L1 | CO2 | 1M |
|  | f) | | Draw Hay’s Bridge. | L1 | CO2 | 1M |
|  | g) | | What are the various types of Digital volt meter? | L1 | CO2 | 1M |
|  | h) | | What is working principle of RF milli volt meter? | L1 | CO2 | 1M |
|  | i) | | What is Graticules,? | L1 | CO3 | 1M |
|  | j) | | What is magnetic sensor? | L1 | CO3 | 1M |
|  | k) | | What is a Oscilloscope probe? | L2 | CO3 | 1M |
|  | l) | | What is synthesized signal generator? | L1 | CO4 | 1M |
|  | m) | | What is period measurement? | L1 | CO4 | 1M |
|  | n) | | What is synthesis? | L2 | CO4 | 1M |
| **Unit - I** | | | | | | |
| 2. | a) | Differentiate Series type ohmmeter and Shunt type ohmmeter. | | L1 | CO1 | 7M |
|  | b) | The shunt type voltmeter uses a 10mA D’Arsonval movement with an internal resistance of 5ohms.The battery voltage = 3V.It is desired to modify the circuit by adding an appropriate resistor Rsh across the movement, so that the instrument will indicate 0.5 ohms at the midpoint on its scale. Calculate the value of shunt resistor Rsh ii) the value of the current limiting resistor. | | L3 | CO1 | 7M |
| **(OR)** | | | | | | |
| 3. | a) | Explain the following terms with examples  i)Significant figures ii) Statistical analysis iii) Limiting errors | | L1 | CO1 | 7M |
|  | b) | Explain the construction, principle and operation of PMMC instrument. Also derive the expression for deflecting torque. | | L3 | CO1 | 7M |
| **Unit - II** | | | | | | |
| 4. | a) | Draw the bridge circuit used for measurement of low resistance and derive the expression for unknown resistance. | | L2 | CO2 | 7M |
|  | b) | The four arms of a bridge are: arm *ab*: an imperfect capacitor C1 with an equivalent series resistance of r1 arm *bc*: a non-inductive resistance R3, arm *cd*: a non-inductive resistance R4, arm *da*: an imperfect capacitor C2 with an equivalent series resistance of r2 series with a resistance R2.A supply of 450Hz is given between terminals *a* and *c* and the detector is connected between *b* and *d*. At balance: R2=4.8Ω, R3=2000Ω, R4=2850Ω and C2=0.5µF and r2=0.4Ω. Calculate the value of C1 and r1 and also of the dissipating factor for this capacitor. | | L3 | CO2 | 7M |
| **(OR)** | | | | | | |
| 5. | a) | Draw the block diagram of Stair case ramp type DVM and explain its working principle. | | L1 | CO2 | 7M |
|  | b) | Draw the circuit diagram of true RMS voltmeter and explain its functioning? | | L3 | CO2 | 7M |
| **Unit - III** | | | | | | |
| 6. | a) | What is meant by Lissajous figures? Explain how phase and frequency are measured using CRO | | L2 | CO3 | 7M |
|  | b) | What is the minimum distance L that will allow full deflection of 4Cm at the CRO screen with a deflection factor of 1000V/Cm and with an acceleration potential of 4000V? | | L3 | CO3 | 7M |
| **(OR)** | | | | | | |
| 7. | a) | Draw the circuit of Digital storage Oscilloscope and explain its operation. | | L2 | CO3 | 7M |
|  | b) | Explain the current probe with magnetic sensor. | | L2 | CO3 | 7M |
| **Unit - IV** | | | | | | |
| 8. | a) | Explain the Synthesized signal generator. | | L1 | CO4 | 7M |
|  | b) | Explain the various measurement errors in frequency counter. | | L2 | CO4 | 7M |
| **(OR)** | | | | | | |
| 9. | a) | With a neat block diagram, explain the operation of function generator | | L1 | CO4 | 7M |
|  | b) | Draw the block diagram of laboratory square wave generator and explain its operation. | | L2 | CO4 | 7M |

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