**20EI403**

**Hall Ticket Number:**

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| **II/IV B.Tech (Regular ) DEGREE EXAMINATION** | | | | | | | | | | | |
| **August,2022** | | | | | **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 precision. | | | | L1 | CO1 |  |
|  | b) | | What is the working principle of Electrodynamometer? | | | | L1 | CO1 |  |
|  | c) | | Mention the different torques in measuring instrument. | | | | L2 | CO1 |  |
|  | d) | | What are the advantages of instrument transformers? | | | | L1 | CO1 |  |
|  | e) | | List the possible errors that may arise from a Wheatstone bridge. | | | | L1 | CO2 |  |
|  | f) | | What is the applications of Schering bridge? | | | | L1 | CO2 |  |
|  | g) | | What are the advantages of rectifier type instruments? | | | | L1 | CO2 |  |
|  | h) | | What is the use of RF milli-voltmeter? | | | | L1 | CO2 |  |
|  | i) | | Define Electron gun? | | | | L1 | CO3 |  |
|  | j) | | What are graticules? | | | | L1 | CO3 |  |
|  | k) | | What are the difference between square wave and pulse generator? | | | | L2 | CO3 |  |
|  | l) | | What is Time interval Measurements? | | | | L1 | CO4 |  |
|  | m) | | List the advantages of frequency divider generator. | | | | L1 | CO4 |  |
|  | n) | | What is Fourier transform spectrum analyser? | | | | L2 | CO4 |  |
| **Unit - I** | | | | | | | | | |
| 2. | a) | Describe the construction and working principle of PMMC instrument. Derive an expression for the deflecting torque and write advantages of PMMC. | | | | | L3 | CO1 | 7M |
|  | b) | The expected value of voltage to be measured is 150V. However, the measurement gives a value of 149V. Calculate (i) absolute error (ii) percentage error (iii) Relative accuracy (iv) percentage accuracy (v) Error expressed as percentage of full scale reading if scale range is 0-200V. | | | | | L3 | CO1 | 7M |
| **(OR)** | | | | | | | | | |
| 3. | a) | Describe the procedure in designing a series type ohmmeter | | | | | L2 | CO1 | 7M |
|  | b) | List the measurement errors and distinguish one from the other. | | | | | L2 | CO1 | 7M |
| **Unit - II** | | | | | | | | | |
| 4. | a) | Derive the balance equation for Wein’s bridge and draw phasor diagram. | | | | | L4 | CO2 | 7M |
|  | b) | An ac bridge has the following constants: arm AB, R = 1000Ω in parallel with C = 0.159 µF; BC, R = 1000Ω; CD, R = 500Ω; DA, C = 0.636 µF in series with an unknown resistance. Find the frequency for which this bridge is in balance and determine the value of the resistance in arm DA to produce this balance. | | | | | L3 | CO2 | 7M |
| **(OR)** | | | | | | | | | |
| 5. | a) | Draw the block diagram of ramp type DVM and explain its working principle. | | | | | L1 | CO2 | 7M |
|  | b) | Describe the construction and working of Q-meter. | | | | | L2 | CO2 | 7M |
| **Unit - III** | | | | | | | | | |
| 6. | a) | Distinguish between vertical and horizontal deflection system. | | | | | L4 | CO3 | 7M |
|  | b) | How much voltage is required across two deflection plates separated by 1 cm to deflect an electron beam 1o if the effective length of the deflection plates is 2 cm and the accelerating potential is 1000V? | | | | | L3 | CO3 | 7M |
| **(OR)** | | | | | | | | | |
| 7. | a) | What is a Lissajous figure? Explain the measurement of phase and frequency using Lissajous figures. | | | | | L2 | CO3 | 7M |
|  | b) | Draw the Block diagram of Digital storage oscilloscope and explain the function of each block. | | | | | L2 | CO3 | 7M |
| **Unit - IV** | | | | | | | | | |
| 8. | a) | With neat sketch explain the working of frequency synthesized signal generators. | | | | | L3 | CO4 | 7M |
|  | b) | Draw the block diagram of Heterodyne wave analyzer and explain its operation. | | | | | L2 | CO4 | 7M |
| **(OR)** | | | | | | | | | |
| 9. | a) | Draw the block of frequency counter and explain its operation. | | | | | L2 | CO4 | 7M |
|  | b) | With neat sketch explain the operation of a fundamental-suppression harmonic analyzer. | | | | | L3 | CO4 | 7M |

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