Code No: R203104B **R20** SET - 1

III B. Tech I Semester Supplementary Examinations, May/June -2024
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1. a) Explain the following terms in detail. [7M]
   (i) Speed of response (ii) Fidelity (iii) Lag and Dynamic error.
   b) A Voltmeter having a sensitivity of 30k/V reads 80V on a 100V scale, when connected across an unknown resistor. The current through the resistor is 2mA. Calculate the % of error due to loading effect. [7M]

(OR)

2. a) List out different AC voltmeters and explain the working of any one voltmeter in detail. [7M]
   b) Sketch and explain the principle and operation of Thermocouple type Ammeter. [7M]

UNIT-II

3. a) Draw the block diagram of a signal generator and explain its operation. [7M]
   b) Define a wave analyzer and classify them. Explain the working of a Resonant Wave Analyzer. [7M]

(OR)

4. a) Discuss the frequency range of different types of signal analyzers. [7M]
   b) Describe indetail about Harmonic distortion analyzer. [7M]

UNIT-III

5. a) Explain in detail the construction and working of both analog and digital storage oscilloscope. [7M]
   b) With a neat sketch, explain the construction and working principle of dual trace oscilloscope. [7M]

(OR)

6. a) With a neat block diagram, explain about sampling oscilloscope. [7M]
   b) With a neat sketch, explain the construction and working principle of dual beam CRO. [7M]

UNIT-IV

7. a) Explain Anderson bridge with vector diagram and also derives balance Equation. [7M]
   b) In the case of a Schering bridge, arm Ac has R=4.7kΩ. Arm CD has unknown elements. Arm BD has C=0.1μF Arm AB=4.7KΩ is shunt with 1MF. Determine Values of components is the arm CD. [7M]

(OR)

8. a) Analyze Q meter? Explain about its application. [7M]
   b) A circuit having an effective capacitance of 160pF is tuned to a frequency of 1.2MHz. In this the current falls to 70.7% of its resonant value when the frequency of an emf of constant magnitude injected in series with the circuit deviates from the resonant frequency by 6KHz. Calculate the Q factor and effective resistance by 6KHz. [7M]

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UNIT-V

9. a) Explain the operation of LVDT. Explain it's merits demerits and applications. [7M]
   b) An ac LVDT has the following data: [7M]
   Input = 6.3 V, Output = 5.2 V, range ± 0.5 in. Determine
   (i) Calculate the output voltage vs Core position for a core moment going from + 0.45 in. to – 0.30 in.
   (ii) The output voltage when the core is -0.25 in. from the centre

(OR)

10. a) Explain about Thermistors and Sensistors for the measurement of Temperature. [7M]
    b) A Thermistor has a temperature coefficient of resistance of -0.04 over a temperature range of 20oC to 60oC. Find the resistance of the thermistor at 35oC if the resistance of the thermistor at 25oC is 100 ohm [7M]