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Electronics Instrumentation
(1020)

P. Pages : 3

Time : Three Hours **Max. Marks :100**

Instructions to Candidates :
1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Solve **any two** sub questions from each unit.
5. Draw diagrams wherever necessary.
6. Assume suitable data if necessary.
7. Use of non - programmable calculators is allowed.
8. Figure to the right indicate full marks.

UNIT - I

1. a) i) A voltmeter having sensitivity of 1kΩ/volt is connected across a unknown resistance in series with milliammeter reading 30 volt on 150 volt scale, when millimeter reads 600 milliampere, calculate **5**
i) Apparent resistance of unknown resistance.
ii) Actual resistance of unknown resistance
iii) Error due to loading effect of voltmeter.

ii) Differentiate between Accuracy and precision. **5**

b) i) Explain IEEE - 488 standard with block diagram. **5**

ii) The expected value of voltage across a resistor is 80 volt, However the measurement gives the value of 79v calculate. **5**

i) Absolute error.
ii) Percentage error,
iii) Relative accuracy
iv) Percentage accuracy.

c) What is mean by "Error" ? Explain various types of Error in instrumentation system with suitable example. **10**

UNIT - II

2. a) Explain the working of permanent magnet moving coil (PMMC) as a D.C Voltmeter and D. C ammeter with design of multiplier resistance and shunt resistance. **10**

b) With help of diagram, Explain working of Electrodynamometer Explain How electrodynamometer is useful in power measurement. **10**

c) Write short note on. **10**

i) Calibration of D. C Instrument.

ii) Rectifier type Instrument.

UNIT - III

3. a) What are the drawback of wheatstone bridge ? Explain Kelvin's simple bridge for eliminating these drawback. **10**

b) Differentiate between A. C bridge and D.C. bridge. **10**
Explain Wein bridge with suitable sketch and determine the formula for unknown frequency.

c) Draw and explain the Hay's bridge with neat sketch. **10**
Find series equivalent inductance and resistance of Hay's bridge with component values as
$R_1 = 2k\Omega,\ C_1 = 1\mu f,\ R_2 = 10k\Omega,\ R_3 = 1k\Omega,\ u\ell = 3000\ rad/sec.$

UNIT - IV

4. a) List various performance parameter of digital voltmeter. **10**
Draw and Explain the Ramp type Digital voltmeter with block diagram.

b) Draw and Explain Galvanometric Recorder for recording analog signal and Magnetic recorder for recording digital signal. **10**

c) i) Explain in brief Drum printer. **5**

ii) Explain servo - balancing potentiometric type Digital - voltmeter with neat sketch. **5**

UNIT - V

5. a) Explain the thermocouple principle for temperature measurement. Discuss various types of thermocouple with their temperature ranges. **10**

b) What is mean by Gauge factor (K). Explain various types of Strain gauges with neat sketch. **10**

c) Write a short note on. **10**

i) Magnetic flow - meter.

ii) Lux - Meter.

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