

CBCS SCHEME



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17EC32

Third Semester B.E. Degree Examination, Dec.2019/Jan.2020 Electronic Instrumentation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the following terms briefly:
 - i) Accuracy
 - ii) Precision
 - iii) Resolution and significant errors. (07 Marks)
- b. Explain the operation of the multirange ammeter with suitable circuit. (05 Marks)
- c. Explain the operation of the RF Ammeter (Thermocouple) considering the different types with suitable diagrams. (08 Marks)

OR

- 2 a. With suitable diagrams, explain briefly the operation of the multirange voltmeter. (07 Marks)
- b. Calculate the value of the multiplier resistance on the 50V range of a dc voltmeter, that uses a $200\mu\text{A}$ meter measurement with an internal resistance of 100Ω . (05 Marks)
- c. With block diagram approach, explain the operation of the true RMS voltmeter. (08 Marks)

Module-2

- 3 a. Explain the operation of the ramp type digital voltmeter with voltage to time conversion waveform and block diagram. (08 Marks)
- b. Explain the operation of the $3\frac{1}{2}$ digit display with suitable diagram. (05 Marks)
- c. With block diagram approach explain the operation of the digital phase meter. (07 Marks)

OR

- 4 a. With block diagram, approach explain the operation of the digital PH meter. (06 Marks)
- b. Explain the operation of the digital frequency meter with suitable block diagram. (07 Marks)
- c. With block diagram approach, explain the operation of the successive approximation digital voltmeter. (07 Marks)

Module-3

- 5 a. With block diagram of oscilloscope, explain the operation of CRO. And also mention the functions of each block. (07 Marks)
- b. Explain the operation of the sweep or time base generator with suitable circuit and relevant Sawtooth output waveform. (07 Marks)
- c. Explain the operation of the conventional standard signal generator with relevant block diagram. (06 Marks)

OR

- 6 a. With block diagram approach, explain the operation of the AF sine and square wave generator. (06 Marks)
- b. Explain the operation of the function generator with relevant block diagram. (06 Marks)
- c. Briefly explain the operation of digital storage oscilloscope with relevant block diagram. (08 Marks)

1 of 2

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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Module-4

- 7 a. Explain the operation of the phase meter which detects the phase for the positive half and negative half using different circuits. (07 Marks)
- b. Explain the operation of the field strength meter using diode circuit. (06 Marks)
- c. A capacitance comparison bridge is used to measure a capacity impedance at a frequency of 2kHz. The bridge constants at balance are $C_3 = 100\mu\text{F}$, $R_1 = 10\text{K}\Omega$, $R_2 = 50\text{K}\Omega$, $R_3 = 100\text{K}\Omega$. Find the equivalent series circuit of the unknown impedance. (07 Marks)

OR

- 8 a. With Maxwell's bridge circuit, explain the balance condition. And derive an expression for the R_x and L_x . (07 Marks)
- b. Find the equivalent parallel resistance and capacitance that causes a Wein bridge with the following component values $R_1 = 3.1\text{K}\Omega$, $C_1 = 5.2\mu\text{F}$, $R_2 = 25\text{K}\Omega$, $f = 2.5\text{K}\Omega$, $R_4 = 100\text{K}\Omega$. (07 Marks)

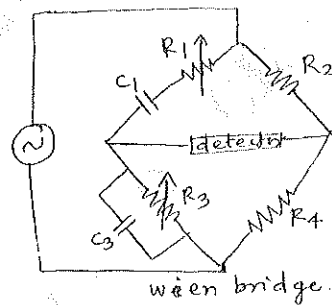


Fig.Q.8(b)

- c. Explain the operation of the basic Megger circuit with neat diagram. (06 Marks)

Module-5

- 9 a. Explain the different types of resistive transducers with figure. Mention the advantages and disadvantages. (07 Marks)
- b. Explain the operation of the Industrial platinum resistance thermometer with bridge circuit. (07 Marks)
- c. Explain the operation of the photo transistor with construction, symbol, output characteristics and photo transistor with relay circuit. (06 Marks)

OR

- 10 a. Explain the Thermistor with resistance V_{ss} temperature graph, and various configurations of thermistor. And also mention the advantages and limitations. (07 Marks)
- b. Explain the operation of the linear variable differential transducer with construction, various core position of LVDT and variation of output voltage with displacement. (07 Marks)
- c. Explain the operation of the piezoelectrical transducer with construction and equivalent circuit. (06 Marks)
