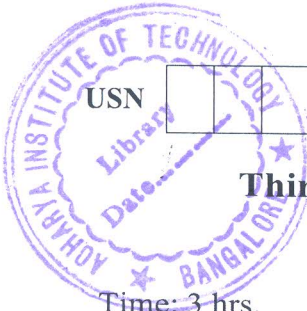


CBCS SCHEME



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17EC32

Third Semester B.E. Degree Examination, Aug./Sept.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 with suitable example accuracy and precision. (05 Marks)
- b. What is loading effect? A simple circuit of $R_1 = 20 \Omega$ and $R_2 = 25 \Omega$ connected to a 250 V dc source. If the voltage across R_2 is to be measured by the voltmeter having
 - (i) A sensitivity of $500 \Omega/V$
 - (ii) A sensitivity of $10,000 \Omega/V$Find which voltmeter will read more accurately. Both the meters are used on the 150 V range. (10 Marks)
- c. Explain multirange voltmeter with a neat diagram. (05 Marks)

OR

- 2 a. List and explain the types of measurement errors. (06 Marks)
- b. The meter A has a range of 0-100V and multiplier resistance of $25 K\Omega$. The meter B has a range 0-1000 V and a multiplier resistance of $150 K\Omega$. Both meters have basic meter resistance of $1 K\Omega$. Find which meter is more sensitive. (04 Marks)
- c. What is a thermocouple? Explain the different types of thermocouple and what are the limitations of thermocouple. (10 Marks)

Module-2

- 3 a. Explain the working of linear ramp type DVM. (10 Marks)
- b. Explain with a diagram, the working of digital PH meter. (10 Marks)

OR

- 4 a. With the help of neat diagram, explain the working of successive approximation type DVM. (10 Marks)
- b. With the help of a diagram, explain the operation of universal counter timer. (10 Marks)

Module-3

- 5 a. With a neat block diagram, explain the general purpose of CRO. (08 Marks)
- b. Explain in detail the working of square and pulse generator. (06 Marks)
- c. Explain working of sweep frequency generator. (06 Marks)

OR

- 6 a. Explain in detail the working of digital storage oscilloscope and list the advantages of DSO. (10 Marks)
- b. Explain general pulse characteristics. (04 Marks)
- c. Explain in detail the working of function generator. (06 Marks)

Module-4

- 7 a. Explain in detail the working of Wien bridge oscillator and find the parallel R and C that causes a Wien bridge to null with the following components values:
 $R_1 = 2.7 \text{ K}\Omega$, $R_2 = 22 \text{ K}\Omega$, $C_1 = 5 \text{ }\mu\text{F}$, $R_4 = 100 \text{ K}\Omega$ and the operating frequency is 2.2 kHz. (08 Marks)
- b. Explain and derive the balance equation of wheat stone bridge and mention the limitation. (04 Marks)
- c. What is Meggar? Explain basic Meggar circuit. (08 Marks)

OR

- 8 a. Explain and derive expression for Maxwell's bridge. If bridge constants are $C_1 = 0.5 \text{ }\mu\text{F}$, $R_1 = 1200 \text{ }\Omega$, $R_2 = 700\Omega$, $R_3 = 300 \text{ }\Omega$. Find the resistance and inductance of coil. (08 Marks)
- b. Explain Wagner's earth connection. (06 Marks)
- c. Explain with a diagram the operation of stroboscope. (06 Marks)

Module-5

- 9 a. List the factors to be considered while selecting transducers. (05 Marks)
- b. Derive expression for the gauge factor $K = 1 + 2\mu$ and explain the bonded resistance wire strain gauges with a neat diagram. (10 Marks)
- c. What is transistor? Explain different form of thermistor. (05 Marks)

OR

- 10 a. List the advantages of LVDT. (04 Marks)
- b. Explain the construction, principle and operation of LVDT. (08 Marks)
- c. Explain with a diagram the operation of resistive pressure transducer. (08 Marks)
