

CBCS SCHEME

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15EC35

Third Semester B.E. Degree Examination, Dec.2018/Jan.2019 Electronic Instrumentation

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Define the following :
i) Accuracy ii) precision iii) sensitivity iv) resolution. (08 Marks)
b. Calculate the value of shunt resistance if 5mA meter movement with an internal resistance of 500Ω is to be converted into a 0–500mA. (04 Marks)
c. What are the factors to be considered in choosing an analog voltmeter. (04 Marks)

OR

- 2 a. For the following given data calculate :
i) Arithmetic mean
ii) Deviation of each value
iii) Average deviation
iv) Standard deviation. (08 Marks)

X ₁	X ₂	X ₃	X ₄	X ₅
19.7	20.1	20.2	19.6	19.7

- b. Define thermocouple instruments and brief about different types of thermocouples. (08 Marks)

Module-2

- 3 a. Explain the operating principle of ramp type DVM with relevant diagrams. (08 Marks)
b. With a neat block diagram, explain the operation of a basic digital multimeter. (08 Marks)

OR

- 4 a. A 4½ digit voltmeter is used for voltage measurement :
i) Find its resolution
ii) How would 12.98V be displaced on a 10V range
iii) How would 0.6973V be displaced on 1V and 10V range. (04 Marks)
b. Explain the operation of digital phase meter with a neat sketch. (08 Marks)
c. Indicate the outstanding qualities/characteristics of a DVM. (04 Marks)

Module-3

- 5 a. With a neat block diagram, describe the working of each stage of CRO. (08 Marks)
b. What are the requirements of a pulse? (04 Marks)
c. Describe the operation of standard signal generator. (04 Marks)

OR

- 6 a. Explain the operation of digital storage oscilloscope with a neat block diagram. (08 Marks)
 b. With a neat block diagram, explain the operation of function generator. (08 Marks)

Module-4

- 7 a. Explain in details the working of Megger. State it applications. (08 Marks)
 b. Explain and derive expression for Maxwell's bridge. If bridge constants are $C_1 = 0.5\mu\text{F}$, $R_1 = 1200\Omega$, $R_2 = 700\Omega$, $R_3 = 300\Omega$. Find the resistance and inductance of coil. (08 Marks)

OR

- 8 a. Describe the working principle of an output power meter with a neat sketch. (08 Marks)
 b. Find the equivalent parallel resistance and capacitance that causes a Wein's bridge to null with the following values. $R_1 = 2.7\text{K}\Omega$, $C_1 = 5\mu\text{F}$, $R_2 = 22\text{K}\Omega$, $R_4 = 100\text{K}\Omega$ with $f = 2.2\text{KHz}$. (08 Marks)

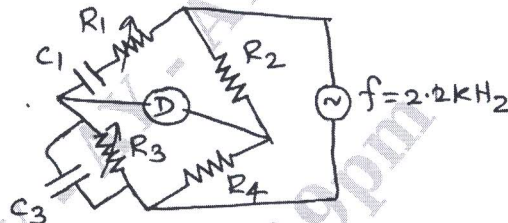


Fig.Q8(b)

Module-5

- 9 a. Define Gauge factor and prove that $K = 1 + 2\mu$. (10 Marks)
 b. Explain the operation of semiconductor photo diode and photo transistor. (06 Marks)

OR

- 10 a. List the factors to be considered while selecting a transducer for given application. (04 Marks)
 b. A displacement transducer with a shaft stroke of 3.0 inch is applied to the circuit. The total resistance of the pot is $5\text{K}\Omega$. The applied voltage V_t is 5V. When the Wipor is 0.9 inch from B, what is the value of the output voltage? (04 Marks)
 c. Explain the construction and operation of a LVDT with a neat sketch. (08 Marks)
