WEST BENGAL STATE UNIVERSITY

B.Sc. Programme 6th Semester Examination, 2021

ELSGDSE06T-ELECTRONICS (DSE2)

ELECTRONIC INSTRUMENTATION

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

GROUP-A

Answer any *five* questions from the following 2×5 = 10

1. Define (a) accuracy and (b) precision.

2. The nominal value of a resistance is 4.7 kΩ, while measurements yield a value of 4.63 kΩ, calculate (a) relative accuracy of the measurement and (b) percentage accuracy.

3. What is loading effect for a measuring instrument?

4. What are differences between active and passive transducers?

5. What two conditions must be satisfied to balance an ac bridge?

6. Why we use negative high voltage supply in CRO?

7. Why delay line is used in vertical deflection system of a CRO?

8. What is a RTD and where it is used?

GROUP-B

Answer any *six* questions from the following 5×6 = 30

9. Draw the block diagram of a general purpose CRO and explain the function of each section. 2+3

10. With the help of labelled block diagram explain the working of dual slope type integrating type DVM. 2+3

11. Draw the block diagram of function generator and explain the method of producing sine waves. 2+3

12. Draw the basic circuit of a DC ammeter and derive the expression for shunt resistance. 2+3

13.(a) What is an ohmmeter? 1

(b) Differentiate between a series type ohmmeter and shunt type ohmmeter. 4

14 With schematic drawing, explain the operation of LVDT. 5

15. The arms of a four-arm bridge *a, b, c* and *d* supplied with sinusoidal voltage have the following values: 2+3

arm *ab*: A resistance of 800 W in parallel with a capacitance of 2 mF.

arm *bc*: 400 W resistance

arm *cd*: 1 kW resistance

arm *da*: A resistance R_2 in series with 2 mF capacitance.

Draw the circuit and determine the value of R_2 and frequency at which the bridge will balance.

16. Describe the operation of a pressure transducer employing the principle of an inductive transducer. State the applications of photovoltaic cells. 4+1

17.(a) State three types of systematic errors. 1

(b) What type of movement is used for an ammeter? 1

(c) What are the effects of using a voltmeter of low resistivity? 3

18. Draw the circuit diagram of De Sauty's bridge and describe how an unknown capacitance can be measured with the help of this bridge. State the limitations of this bridge. 1+3+1

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within* 1 *hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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