**CBCS SCHEME**

USN | | | | | | | | | | |

# Third Semester B.E. Degree Examination, July/August 2022
## 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 figures
　　iv) Gross errors. **(10 Marks)**
　b. What is thermocouple? Explain different types of thermocouple. **(10 Marks)**

### OR

2　a. Explain multirange voltmeter With a neat diagram. **(05 Marks)**
　b. Convert a basic 'D' Arsonval movement with internal resistance of 50Ω and full scale deflection current of 2mA into a multirange DC voltmeter with voltage range of $0 - 10V$, $0 - 50V$, $0 - 250V$ connect the multiplier resistance in series with 'D' Arsonval movement. [Fig.Q2(b)].
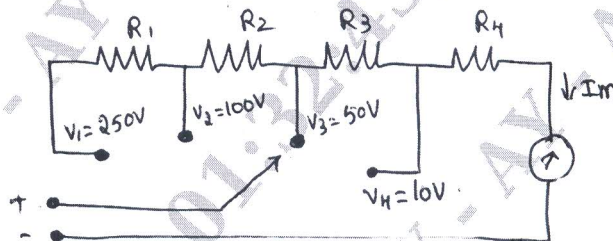


Fig.Q2(b) **(10 Marks)**

　c. Calculate the values of multiplier resistance on the 50V range of a DC voltmeter, that uses a $200\mu A$ , meter measurement with an internal resistance of $100\Omega$. **(05 Marks)**

## Module-2

3　a. Explain the operation of the ramp type digital voltmeter with voltage to time conversion waveform and block diagram. **(10 Marks)**
　b. With the help of neat diagram, explain the working of successive approximation type DVM. **(10 Marks)**

### OR

4　a. Explain the working of digital tachometer and digital pH meter. **(10 Marks)**
　b. What is the principle used in measuring frequency of a signal digital technique, with diagram. Explain the operation of a digital frequency matter. **(10 Marks)**

## Module-3

5　a. Draw the block diagram of CRO and explain the functions of each block. **(10 Marks)**
　b. Draw the block diagram of CRT and explain the function of each block with CRT features. **(10 Marks)**

**OR**

6  a.  Explain the operation of an AF sine and square wave generator with the help of a block diagram. **(10 Marks)**
   b.  Explain in detail the working of digital storage oscilloscope and list the advantages of digital storage oscilloscope. **(10 Marks)**

## Module-4

7  a.  Sketch and explain the operation of a phase sensitive detector to compare the phase of a signal with a reference signal. **(10 Marks)**
   b.  Derive the balance equation for Wheatstone's bridge and mention its advantages and limitations. **(10 Marks)**

**OR**

8  a.  Find parallel R and C that causes a Wein's bridge to null with the following components values $R_1 = 2.7K\Omega$, $R_2 = 22K\Omega$, $C_1 = 5\mu F$, $R_4 = 100K\Omega$ and operating frequency is 2.2KHz. **(10 Marks)**
   b.  Draw the Maxwell's bridge to determine inductance interms of known capacitance and derive Q – factor and expression inductance. **(10 Marks)**

## Module-5

9  a.  Explain the operation of resistive position transducer with block diagram. **(10 Marks)**
   b.  What is gauge factor? Derive an expression for gauge factor and prove that $K = 1 + 2\mu$. **(10 Marks)**

**OR**

10  a.  Explain the construction, principle and operation of LVDT. **(10 Marks)**
    b.  What are the different types of photoelectric transducer? Explain. **(10 Marks)**

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