



Third Semester B.E. Degree Examination, Dec.09/Jan.10
Electronic Instrumentation



Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. Explain the following:
 - i) Systematic errors ii) Relative errors. (04 Marks)
- b. Explain the working principle of multi-range voltmeter, with the help of suitable circuit diagram. (08 Marks)
- c. Convert a basic meter movement with an internal resistance of 50Ω and a full scale deflection current of 2 mA in to a multi-range 'dc' voltmeter with voltage ranges of $0-10\text{V}$, $0-50\text{V}$, $0-100\text{V}$ and $0-250\text{V}$ with following Fig.1(c). (08 Marks)

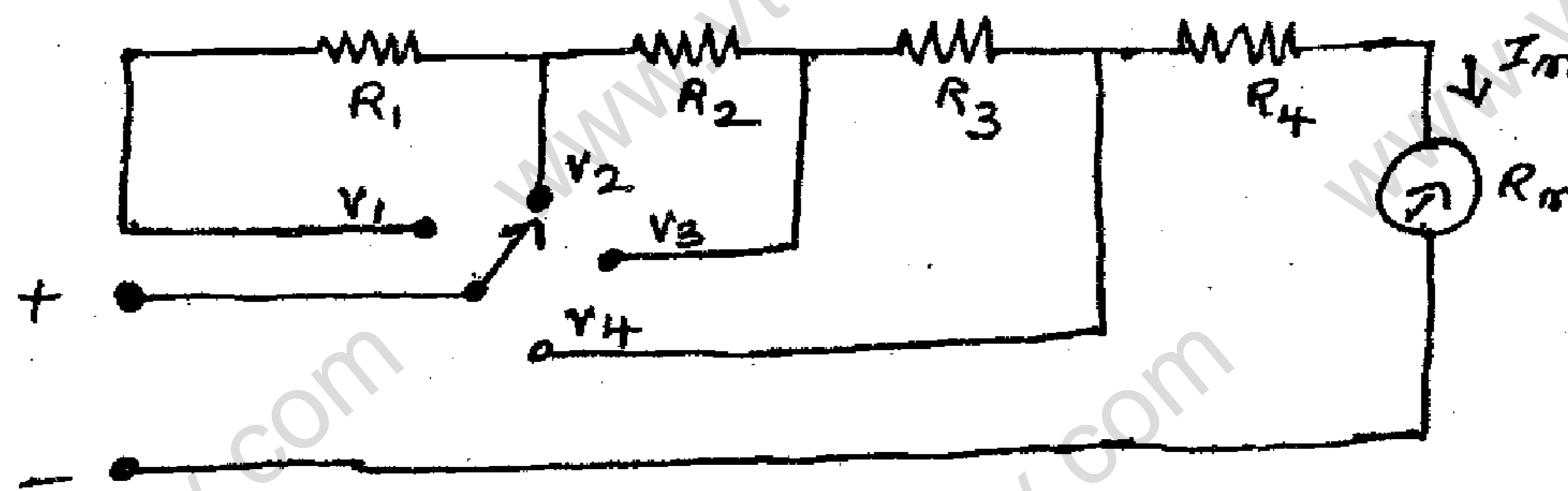


Fig.1(c).

- 2 a. Explain the ramp type digital voltmeter with the help of block diagram. (10 Marks)
- b. Explain the digital multimeter with basic circuit diagram. (10 Marks)
- 3 a. Explain the C.R.T. features briefly. (06 Marks)
- b. With the basic block diagram, explain the principle of operation of simple C.R.O. (08 Marks)
- c. Explain the operation of an electronic switch, with the help of a block diagram. (06 Marks)
- 4 a. Explain the principle and operation of sampling oscilloscope. What are its advantages and disadvantages? (10 Marks)
- b. Explain the operation of digital storage-oscilloscope with the help of a block diagram. Mention the advantages. (10 Marks)

PART - B

- 5 a. With a block diagram, explain modern laboratory signal generator. (10 Marks)
- b. Sketch the circuit and waveforms for an OP-AMP astable multivibrator for use as a square wave generator. Explain its operation. (10 Marks)
- 6 a. Explain the Wheatstone bridge and derive the balance equation for Wheatstone bridge. (06 Marks)
- b. Explain AC bridge and derive the balance equation for capacitance comparison bridge. (08 Marks)
- c. Find the equivalent parallel resistance and capacitance that causes a wein bridge to null with the following components values:
 $R_1 = 3.1 \text{ k}\Omega$, $c_1 = 5.2 \mu\text{F}$, $R_2 = 25 \text{ k}\Omega$, $f = 2.5 \text{ kHz}$ and $R_4 = 100 \text{ k}\Omega$ (06 Marks)
- 7 a. Explain the potentiometer with figure. (06 Marks)
- b. Explain the resistance thermometer with circuit diagram. (06 Marks)
- c. Explain the construction, principle and operation of LVDT. Show characteristics curve. (08 Marks)
- 8 a. Explain piezo electrical transducer, with circuit diagram. (06 Marks)
- b. Explain the light emitting diodes (LED) with diagram. (06 Marks)
- c. Explain how power is measured using a bolometer, with a suitable diagram. (08 Marks)

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