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06IT35

Third Semester B.E. Degree Examination, Dec.08/Jan.09
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 in brief:
i) Accuracy and precision.
ii) Resolution.
iii) Grass error. **(06 Marks)**

b. With relevant expressions explain the working of practical multirange voltmeter. **(06 Marks)**

c. A basic D'Arsonoral movement with an internal resistance of 50 Ω and a full scale deflection current of 2 mA is to be used as a multirange voltmeter. Design a series string of multipliers to obtain the voltage ranges of 0 – 10 V, 0 – 50 V, 0 – 100 V, 0 – 500 V. **(08 Marks)**

2 a. Describe in detail working of successive approximation DVM. **(10 Marks)**

b. With a block schematic explain the working of digital multimeter. **(10 Marks)**

3 a. Describe the working of basic CRO with the block diagram. **(08 Marks)**

b. Explain what are Lissagous pattern. In the CRO the horizontal signal is designated as f_h and vertical signal as f_v, with reference to this explain in brief the various Lissajous patterns for,

i) $f_v = f_h$ ii) $f_v = 2f_h$ iii) $f_v = 3f_h$ iv) $f_v = 4f_h$ v) $f_v = 5f_h$

vi) $f_v = \frac{1}{2} f_h$ vii) $f_v = \frac{1}{3} f_h$ viii) $f_v = \frac{1}{4} f_h$ ix) $f_v = \frac{1}{5} f_h$ **(12 Marks)**

4 a. With a block diagram explain construction and working of digital storage oscilloscope. **(10 Marks)**

b. With relevant block diagrams and waveforms explain the working of sampling oscilloscope. **(10 Marks)**

Part B

5 a. Explain the working of AF sine and square wave generator. **(10 Marks)**

b. With a block diagram, explain the working of pulse generator. **(10 Marks)**

6 a. A wheatstone's bridge shown with corresponding resistances. The battery voltage is 5V and its internal resistance is negligible. The galvanometer used is of sensitivity 5 mm/μA and an internal resistance of 200 Ω. Determine the deflection of galvanometer caused by 2 Ω unbalance in arm AD. Also determine the sensitivity of the bridge in terms of deflection per unit change in resistance. **(08 Marks)**

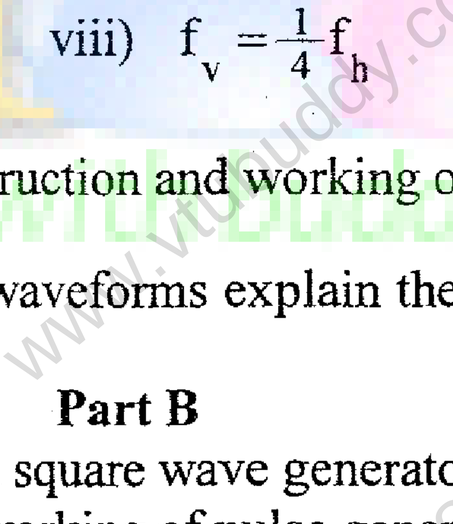

Fig. Q6 (a)

6 b. An AC bridge with terminals A, B, C, D (consecutively marked) has in arm AB a pure resistance. Arm BC has a resistance of 800 Ω in parallel with a capacitor of 0.5 μF, arm CD has a resistance of 400 Ω in series with a capacitor of 1.0 μF. Arm DA has a resistance of 1000 Ω,

i) Obtain the value of the frequency for which the bridge can be balanced by first deriving the balance equations connecting the branch impedance and

ii) Calculate the value of the resistance in arm AB to produce balance. **(12 Marks)**

7 a. With a neat sketch explain construction and working of LVDT. **(08 Marks)**

b. What is gauge factor? Derive appropriate relation for the same. **(06 Marks)**

c. A platinum temperature transducer has a resistance of 100 Ω at 25°C,

i) Find its resistance at 75°C if the platinum has a temperature coefficient of 0.00392/°C.

ii) If the platinum temperature transducer has a resistance of 200 Ω. Calculate the temperature. Use linear approximation. **(06 Marks)**

8 a. With a neat sketch explain construction and working of platinum RTD. **(10 Marks)**

b. Describe the working of optical pyrometer. Mention its merits and demerits. **(10 Marks)**

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