

**DIPLOMA – VIEP – ELECTRONICS AND
COMMUNICATION ENGINEERING (DECVI) /
ADVANCED LEVEL CERTIFICATE COURSE IN
ELECTRONICS AND COMMUNICATION
ENGINEERING (ACECVI)**

00430

Term-End Examination

December, 2014

**BIEL-029 : ELECTRONIC MEASUREMENT AND
INSTRUMENTS**

Time : 2 hours

Maximum Marks : 70

Note : *Question no. 1 is compulsory. Attempt any four questions from the remaining. All questions carry equal marks.*

1. (a) The power requirements of the D'Arsonval movement are 2
- (i) 25 μ W to 200 μ W
 - (ii) 30 μ W to 800 μ W
 - (iii) 200 μ W to 600 μ W
 - (iv) 800 μ W to 1000 μ W

- (b) When the oscilloscope has not been triggered, the electron beam in the CRT is 2
- (i) turned on
 - (ii) turned off
 - (iii) turned on and then off
 - (iv) turned off and then on
- (c) PMMC instrument is used to measure the following quantity : 2
- (i) ac
 - (ii) dc
 - (iii) ac and dc
 - (iv) None of the above
- (d) In an oscilloscope application, the typical resolution for A/D conversion is 2
- (i) 7 or 8 bits
 - (ii) 8 or 9 bits
 - (iii) 6 or 7 bits
 - (iv) 5 or 6 bits

(e) In LC tuned circuit, the resonant frequency of a circuit is given by 2

(i) $f = \frac{1}{\pi\sqrt{LC}}$

(ii) $f = \frac{2}{\pi\sqrt{LC}}$

(iii) $f = \frac{1}{2\pi\sqrt{LC}}$

(iv) $f = \frac{2\pi}{\sqrt{LC}}$

(f) The successive approximation type of A/D is faster than flash type A/D converter. 2

(i) True

(ii) False

(g) A PIN diode exhibits positive resistance properties. 2

(i) True

(ii) False

2. (a) What is the difference between primary and secondary standards? 7

(b) A voltmeter, having a sensitivity of 1,000 Ω/V , reads 40 V on its 150-V scale when connected across an unknown resistor in series with a milliammeter. When the milliammeter reads 800 mA, calculate (a) the apparent resistance of the unknown resistor (b) the actual resistance of the unknown resistor (c) the error due to the loading effect of the voltmeter. 7

3. (a) Explain ac voltmeter section of commercial multimeter. 7
- (b) A meter movement has an internal resistance of $100\ \Omega$ and requires $1\ \text{mA}$ dc for full-scale deflection. Shunting resistor R_{sh} , placed across the movement, has a value of $100\ \Omega$. Diodes D_1 and D_2 have an average forward resistance of $400\ \Omega$ each and are assumed to have infinite resistance in the reverse direction. For a $10\ \text{V}$ ac range, calculate (a) the value of multiplier R_S ; (b) the voltmeter sensitivity of the ac range. 7
4. Explain the successive approximation type DVM and integrating type DVM with block diagram and waveform. 14
5. (a) What are the major components of CRT? 7
- (b) What is oscilloscope probe compensation? How is this adjusted? What effects are noted when the compensation is not correctly adjusted? 7
6. (a) Explain the horizontal deflection system of an oscilloscope. 7
- (b) What is the minimum distance, L , that will allow full deflection of $4\ \text{cm}$ at the oscilloscope screen with a deflection factor of $100\ \text{V/cm}$ and with an accelerating potential of $2,000\ \text{V}$? 7

7. (a) Explain the basic principle of oscillation using block diagram. 4
- (b) With the help of a block diagram explain the spectrum and logic analyser.
8. Write short notes on any **four** of the following: $4 \times 3 \frac{1}{2} = 14$
- (i) Sources of errors in instrument
 - (ii) Analog to Digital Converter
 - (iii) CRO probes
 - (iv) Calibration of DC instruments
 - (v) Function generator
 - (vi) Dual slope type DVM
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