

GANPAT UNIVERSITY

B.Tech Semester V Electronics & Communication Engineering
Regular Examination December 2013

2EC506 Electronic Measurement Techniques

Max. Time: 3 Hrs.]

[Max. Marks: 70

Instructions:

1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

SECTION-I

- Que-1** (A) Draw and explain the working of Electrodynamo Meter with neat and clean diagram. 6
- (B) Describe all statistical analysis to remove random error with example. 6
- OR**
- (A) Enlist commonly used displays in the digital electronic field and explain working principle of Liquid Vapour Display (LVD). 6
- (B) For the following given data calculate Arithmetic mean, deviation of each value, algebraic sum of the deviations, average deviations and standard deviation. Given Data: 48.8, 49.5, 46.9, 48.9, 50.1, and 49. 6
- Que-2** (A) Draw block diagram of general purpose oscilloscope. Find minimum distance L , which will allow full deflection of 5cm at the oscilloscope screen with a deflection factor of 120V/cm and with an acceleration potential of 2200V? 6
- (B) How the electron beam is focused to a fine spot on the face of the cathode ray tube? Explain. 5
- OR**
- (A) Prove that for a given accelerating voltage E_a and for a particular dimension of the CRT, the deflection of the electron beam on the screen is directly proportional to the deflection voltage E_d . 6
- (B) What is the function of the delay line? Explain different types of delay line in detail. 5
- Que-3** (A) Explain post deflection acceleration in oscilloscope detail. 6
- (B) Ten measurement of the resistance of a resistor gave 201.2 Ω , 201.7 Ω , 201.3 Ω , 201.0 Ω , 201.5 Ω , 201.3 Ω , 201.2 Ω , 201.4 Ω , 201.3 Ω and 201.1 Ω . Assume that only random errors are present. Calculate (a) the arithmetic mean; (b) the standard deviation of the readings; (c) the probable error. 6

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SECTION-II

- Que-4 (A) Explain photo emissive, photo conductive and photovoltaic transducer in brief with one application for each transducer. What are the differences between each? 6
- (B) List different types of displacement transducers. Explain working principle of variable differential transformer transducer with suitable example. 6

OR

- (A) List different types of temperature transducers and explain working principle of thermocouple. 6
- (B) What is the difference between active and passive transducers? Explain working principle of unbounded strain gage. 6

- Que-5 (A) Define term Resolution and Sensitivity of digital meters. With neat and clean diagram explain operation of microprocessor based Ramp type DVM. 6
- (B) An ac bridge with terminals ABCD has in 5
- Arm AB a resistance of 800Ω in parallel with a capacitor of $0.5\mu\text{F}$,
Arm BC a resistance of 400Ω in series with a capacitor of $1\mu\text{F}$,
Arm CD a resistance of 1000Ω , Arm DA a pure resistance R.
- a. Determine the value of frequency for which the bridge is balanced.
b. Calculate value of r required to produce balance.

OR

- (A) Draw block diagram of instrumentation system and Explain instrumentation amplifier using transducer bridge with one application. 6
- (B) On which principle heterodyne wave analyzer work? Explain with neat and clean block diagram. 5

- Que-6 (A) Which ac bridge is convenient for measuring high-Q coils? Derive expression of L_x and R_x for Hay bridge. 4
- (B) Draw block diagram of frequency selective wave analyzer and RF spectrum analyzer. 4
- (C) Write a short not on Flash type A to D converter. 4

=====END OF PAPER=====