

3E1494

Roll No. : _____

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B. Tech. (Sem. III) (Main & Back) Examination, January - 2013
 Electronics & Comm. (Common for 3EC4 (M & B), 3BM4 (Old Back))
 3EC4 Electronic Measurement & Instrumentation

Time : 3 Hours]

[Total Marks : 80
 [Min. Passing Marks : 24

Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
 (Mentioned in form No. 205)

1. _____ Nil _____

2. _____ Nil _____

UNIT - I

- 1 (a) A circuit was tuned for resonance by 8 different students and the value of their resonant frequency in KH_2 were recorded as 532, 548, 546, 531, 543, 536.
 Calculate :
- (i) Arithmetic mean
 - (ii) Average deviation
 - (iii) Deviation from mean
 - (iv) Variance. 8

- (b) Write short notes on :
- (i) Systematic error
 - (ii) Random error
 - (iii) Normal error
 - (iv) Gross error. 8

OR

- 1 (a) Write short notes on :
- (i) Accuracy
 - (ii) Repeatability
 - (iii) Standard deviation
 - (iv) Precision. 6



- (b) Explain Gaussian error analysis in detail, also write down all the properties of normal distribution. 6
- (c) Define the role of non-linearity and hysteresis on error. 4

UNIT - II

- 2 (a) Explain the working of successive approximation type digital voltmeter with suitable diagram. 8
- (b) Explain the construction and working principle of vector impedance Q meter with neat sketch. 8

OR

- 2 (a) Define and compare the ramp type voltmeter and integrating type voltmeter with respect to working principle, advantages and disadvantages. 12
- (b) Find the equivalent parallel resistance and capacitance that causes wein bridge to null with the $R_1 = 3.1 \text{ k}\Omega$, $C_1 = 5.2 \mu\text{f}$, $R_2 = 25 \text{ k}\Omega$, $R_4 = 100 \text{ k}\Omega$ and $f = 2.5 \text{ kHz}$ component values. 4

UNIT - III

- 3 (a) Explain following in details :
 (a) Multibeam and multirace oscilloscope.
 (b) Dual storage CRO. 5+5=10
- (b) The deflection sensitivity of an CRO is 35 V/cm. If the distance from the deflecting plate to the CRT screen is 16 cm. The length of the deflecting plate is 2.5 cm and the distance between the deflecting plate is 1.2 cm. What is the accelerating voltage ? 6

OR

- 3 (a) Write down the working principle with required block diagram of sampling oscilloscope. 8

[Contd...



- (b) Write down the short note on probes used in CRO.

8

UNIT - IV

- 4 Explain the working frequency selective analyser with suitable diagram and its applications, also differentiate it with respect to heterodyne wave analyser in detail.

16

OR

- 4 (a) Explain random noise generator.
- (b) Why are signal generation needed? Define sweep frequency generator.

6

10

UNIT - V

- 5 (a) Explain the construction details and working principle of LVDT. How displacement is measured by LVDT?
- (b) Enumerate the transducer principle for measurement of following :
- (a) Angular velocity
- (b) Humidity
- (c) Gas flow
- (d) Temperature.

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OR

- 5 (a) What is differential arrangement for taking output from the inductive transducer. Give advantages of their arrangement.
- (b) What are thermistor? Explain their different form of construction. Give the characteristics curve with applications of thermistor.

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