

G 1336

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, MAY 2016**

**Seventh Semester**

Branch : Electronics and Communication Engineering  
EC 010 704—ELECTRONIC INSTRUMENTATION (EC)  
(New Scheme—2010 Admission onwards)

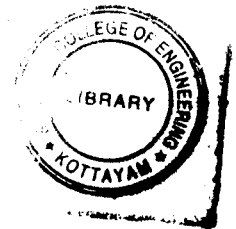
[Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.  
Each question carries 3 marks.*



1. Draw the basic blocks of a generalised instrumentation system.
2. Define and explain gauge factor of strain gauge.
3. What are the precautions to be taken while using a bridge for measurement ?
4. At what frequency bands spectrum analyzers can be used ? Explain.
5. Mention the three basic types of dynamometer to measure torque.

(5 × 3 = 15 marks)

**Part B**

*Answer all questions.  
Each question carries 5 marks.*

6. Explain the various standards used in Instrument calibration.
7. Explain how displacement is measured using resistive potentiometer.
8. Obtain the balance equation for Schering Bridge used for measurement of capacitance.
9. List and briefly explain the five specifications that should be considered while selecting a recording instrument.
10. Describe the applications of piezoelectric transducers for pressure measurement. What are its merits and demerits ?

(5 × 5 = 25 marks)

**Part C**

*Answer all questions.  
Each full question carries 12 marks.*

11. Describe the different types of errors in measurement. What are their causes ? How they can be minimized ?

Or

Turn over

12. The following were the values obtained from the measurement of the value of a resistor :

222.2  $\Omega$ , 221.4  $\Omega$ , 229.0  $\Omega$ , 218.6  $\Omega$ , 221.4  $\Omega$ , 220.5  $\Omega$ , 221.8  $\Omega$ , 219.9  $\Omega$ , 222.5  $\Omega$ , 225.2  $\Omega$ .

Calculate :

- Arithmetic mean.
- Average deviation.
- Standard deviation, treating the data as finite.
- Variance.



13. (a) Describe the construction of foil type strain gauges and explain their advantages over wire-wound gauges.

(b) What is proximity sensor? Explain its applications.

(8 marks)

(4 marks)

Or

14. With neat diagrams, explain the construction and principle of working of a linear voltage Differential Transformer. Explain how the magnitude and direction of displacement of the core of the LVDT can be detected? Discuss its applications.

15. An Owen's bridge is used to measure the properties of a sample of sheet steel at 2 kHz. At balance, arm *ab* is test specimen; arm *bc* is  $R_1 = 100 \Omega$ , arm *cd* is  $C_1 = 0.1 \mu\text{F}$  and arm *da* is  $R_2 = 834 \Omega$  in series with  $C = 0.124 \mu\text{F}$ . Derive balance conditions and calculate the effective impedance of the specimen under test conditions.

Or

16. With a block diagram, describe the functioning of RF telemetry. Compare the performances of the analog and digital types.

17. With a block diagram, explain the various functional units in a DSO. How a transient signal can be displayed and its parameters measured?

Or

18. Draw and explain the architecture of PLC. Explain the programming of the same, with a typical case study.

19. (a) Explain the construction and working of a pH electrode.

(6 marks)

- (b) Explain the working principle of ultrasonic flow meter.

(6 marks)

Or

20. (a) Explain with neat sketches, the construction and working of rotary vane flow meter.

(6 marks)

- (b) With neat sketches, explain the working of general purpose electric dynamometer to measure torque, with sketches.

(6 marks)

[5 × 12 = 60 marks]