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**Question Paper Code : 41261**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fifth Semester

Electronics and Communication Engineering

080290028 – MEASUREMENTS AND INSTRUMENTATION

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by calibration of an instrument?
2. Mention the various errors that occur in PMMC meters?
3. What are the merits of virtual instrumentation?
4. Write a short note on customizing charts and graphs in virtual instrumentation.
5. What is an heterodyne wave analyzer? Write the working principle of it.
6. Mention the various criteria in measuring harmonic distortions.
7. A thermistor has a temperature coefficient of resistance of - 0.05 over a temperature range of 25 °C - 50 °C. Determine the resistance of the thermistor at 40°C if the resistance of the thermistor at 25°C is 120 Ω.
8. Write a short technical note on capacitive microphone.
9. What are the various issues to be considered in interfacing of transducers?
10. Write the advantages of computer controlled instrumentation.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss about the various sources of error encountered in a measurement system with examples. What are the remedies to alleviate these errors? (8)  
(ii) Sketch the construction of Anderson's bridge and derive the balance conditions to get unknown parameters. (8)  
Or  
(b) (i) Explain the principle of operation of Q-meter with neat diagram. (8)  
(ii) What is an MI meter? Explain the working of attraction type MI meter with neat sketches. (8)



12. (a) (i) Draw and explain the block diagram of a typical virtual instrument. (8)  
(ii) Explain about the Labview graphical user interface in detail. (8)

Or

- (b) (i) Write a detailed technical note on the debugging and running a virtual instrument. (8)  
(ii) Discuss in detail about the error handling and Prioritizing Errors in Labview application to virtual instrumentation. (8)
13. (a) (i) What are the various parameters that can be measured using sweep generators. Describe in detail about the working of sweep generator with diagrams. (8)  
(ii) Explain the measurement of phase and frequency using CRO. (8)

Or

- (b) (i) What is meant by harmonic distortion? What are the various causes of harmonics? Explain the principle of operation of harmonic distortion analyzer with neat diagrams. (8)  
(ii) Enumerate the working of a function generator with neat diagram. (8)
14. (a) (i) Classify and explain the various types of transducers. (8)  
(ii) List the various types of Piezo electric materials. Explain the working of Piezo electric transducers in detail with neat diagrams. (8)

Or

- (b) (i) What is a Gauge factor? Derive the expression for the Gauge factor of a strain gauge. (8)  
(ii) Write a detailed technical note on the working principle and applications of optoelectronic transducers. (8)
15. (a) (i) Discuss in detail, about the various components of a typical plug-in Data Acquisition board with neat diagrams. (8)  
(ii) Draw and explain the construction working principle and applications of liquid crystal display. (8)

Or

- (b) (i) Explain the working of successive approximation type analog to digital converter circuit with its characteristics. Also mention the various performance parameters of ADCs. (8)  
(ii) Discuss the functionality and characteristics of IEEE488 bus interfacing. (8)