

**B.TECH. DEGREE EXAMINATION, MAY 2014****Sixth Semester**

Branch : Electronics and Communication Engineering

**ELECTRONIC INSTRUMENTATION (L)**

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]



Maximum : 100 Marks

Time : Three Hours

**Part A***Answer all questions briefly.**Each question carries 4 marks.*

1. State the three types of systematic errors, giving examples of each.
2. Explain the differences between analog and digital signal.
3. What are the advantages of using a foil type strain gauge ?
4. What are the differences between photoemissive, photoconductive and photovoltaic transducers ?
5. What is frequency modulation telemetry system ?
6. What are the limitations of landline telemetry ?
7. Define the term null as it applies to bridge measurement. What are the advantages of this method ?
8. What are the objectives and requirements of recording data ?
9. List out and explain general features of differential pressure type flow meters.
10. Explain the operation of a pressure switch.

(10 × 4 = 40 marks)

**Part B***Answer all questions.**Each full question carries 12 marks. \**

11. Derive the expression for the time response of a second order underdamped system when subjected to unit ramp input. Show that the nature of the response of the system is same as that for a unit step input.

Or

Turn over

12. Explain the following sources of errors :

- |                           |   |
|---------------------------|---|
| (i) Noise.                | (ii) Response time.                     |
| (iii) Design limitations. | (iv) Energy exchanged by interaction.   |
| (v) Transmission.         | (vi) Deterioration of measuring system. |

(6 × 2 = 12 marks)

13. (a) Explain the operation of a photo-multiplier.

(6 marks)

(b) Under what conditions is a dummy strain gauge used ? What are the functions of strain gauges ?

(6 marks)

Or

14. (a) With neat diagrams, describe the operation of a piezoelectric transducer.

(6 marks)

(b) What are the differences between self generating non-self generating and passive inductive transducers ? Explain.

(6 marks)

15. With a neat block schematics, describe a complete telemetry scheme which uses FDM and demultiplexing with PCM/FM modulation.

Or

16. With neat sketches, explain the complete system of a force balance, current telemetry. Compare its performance with RF telemetering system.

17. (a) Explain the measurement of capacitance using low voltage Schering bridge.

(6 marks)

(b) What are the limitations of Wheatstone bridge ? Explain how a guarded Wheatstone bridge is used.

(6 marks)

Or

18. With a neat block diagram, explain the working of a spectrum analyser. What are its applications ?

19. How does the resistance change with temperature for resistance thermometers ? Which is the best material for such a thermometer ? Compare its properties with two possible materials and describe the characteristics of any one of them.

Or

20. Explain the principle of torque measurement. With a block schematics, explain the practical set up for torque measurement.

[5 × 12 = 60 marks]

