

Register Number.....

**B.E. DEGREE EXAMINATIONS: APRIL/MAY 2012**

Sixth Semester

**MECHATRONICS ENGINEERING**

MCT113: Sensors And Signal Processing

**Time: Three Hours**

**Maximum Marks: 100**

**Answer All Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Which of the following is not a self-generating type of transducer
  - a) thermocouple
  - b) LVDT
  - c) Photo voltaic cell
  - d) Bourdon tube of a pressure gauge
2. The gradual departure of the instrument output caused by certain interfering input and component instabilities is termed as
  - a) hysteresis
  - b) dead band
  - c) threshold
  - d) drift
3. A strip chart recorder is
  - a) an active transducer
  - b) an inverse transducer
  - c) an output transducer
  - d) (b) and (c)
4. Sample and hold circuit is otherwise called as
  - a) Sample and track
  - b) Track and hold
  - c) Wait and proceeding
  - d) Wait and hold
5. Intelligent sensors are also called
  - a) smart sensor
  - b) Pressure sensor
  - c) Primary sensor
  - d) none of the above
6. Flash type of ADC is also called as
  - a) Counter type
  - b) Integrating
  - c) Parallel type
  - d) servo controller
7. Multiplexing operation can be carried out either in time domain or
  - a) Width modulation
  - b) Frequency domain
  - c) Reference voltage
  - d) Control voltage
8. A voltage to frequency converter develops an output frequency which is proportional to the
  - a) Digital input signal
  - b) analog output voltage
  - c) Analog input voltage
  - d) digital output
9. Conversion of analog signal to discrete signal is known as
  - a) Quantization
  - b) Companding
  - c) Discretization
  - d) Sampling

10. Choosing a Data Logger

- a) Input Signal, Number of Inputs
- c) Size, Speed/Memory

- b) Real Time Operation
- d) all the above

**PART B (10 x 2 =20 Marks)**

- 11. Define microphone and its types.
- 12. How are transducer are classified?
- 13. Define mixing ratio.
- 14. What is the necessity of Sample and Hold?
- 15. Define quantizing process.
- 16. List out difference between micro sensors and nano sensor.
- 17. Define acquisition time and conversion time?
- 18. What is a data acquisition? Give the functional blocks of a data acquisition system.
- 19. Give short notes on recorder.
- 20. Draw the block diagram of CRT and CRO.

**PART C (5x14 = 70 Marks)**

21. a) Explain the different types of nuclear radiation sensors with a suitable diagram.

**(OR)**

b) Explain the characteristics, selection and specification of sensors

22. a) Explain the role of Film, MEMS and Nano sensors and its recent technology.

**(OR)**

b) Discuss the information coding / processing in smart sensor.

23. a) Explain the working principle of I/P and P/I converter with neat diagram.

**(OR)**

b) Explain the types of A/D converter.

24. a) Draw the block diagram of single and multichannel data acquisition system and explain the function of each block.

**(OR)**

b) Briefly explain (i) Digital filtering (ii) Data conversion

25. a) Describe in detail the working principle of CRO with a neat sketch.

**(OR)**

b). Explain the seven segmental displays with a neat sketch.

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