Roll No.									15

B.E. / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2012

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

FIFTH SEMESTER

EC 9306 – MEASUREMENTS AND INSTRUMENTATION

(REGULATIONS 2008)

Time: 3 Hours Max. Marks:100

Answer All Questions

PART-A **(10 x 2 = 20 Marks)**

1) Define the terms accuracy and precision.
2) What are the various dynamic characteristics of an instrument?
3) Give the classifications of transducers.
4) Write a short note on IC sensors.
5) Enumerate the various features of filters.
6) List out the merits of signal analyzing circuits in digital instruments.
7) A 3 ½ digital voltmeter is used for measuring voltage. Find the resolution of the instrument?
8) How do you measure the Millimeter waves?
9) Why synchronization is required in dual trace CRO?
10) State the advantages of digital recorders.

PART – B **(5 x 16 = 80 Marks)**

11. (a) (i) In a survey of 12 owners of certain model of car, the following figures for average petrol consumption were reported. (8)

29.6, 32.4, 39.4, 28.9, 30.0, 33.3, 31.4, 29.5, 30.5, 31.7, 33.0, 29.2

Calculate:-

(i) Mean Value (ii) Median Value

(iii) Standard Deviation (iv) Variance

(ii) Discuss in detail about the importance of calibration and standards in the measurement equipments. (8)

12. (a) (i) Explain the construction of wire wound strain gauges and derive the expression for the gauge factor. (8)

(ii) Describe in detail about the smart and intelligent sensors. (8)

(or)

(b) (i) Explain the construction, principle and working of a rotational voltage differential transformer (RVDT). (6)

(ii) Draw the schematic diagram of an LVDT and explain its electromechanical transfer characteristics. Show an arrangement to extract the amplitude as well as the phase information contained in the AC output of an LVDT. (10)

13.

(a) (i) The arms of an a.c. Maxwell's bridge are adjusted as. (8)

Arm AB: Nonreactive resistance of 1700Ω

Arm CD: Nonreactive resistance of 600Ω

Arm AD: Nonreactive resistance of 2400Ω in parallel with capacitor of 1μF.

If the bridge is balanced under this condition, find the components of the branch BC.

(ii) With a neat block diagram, explain the function of a spectrum analyzer. (8)

(or)

(b) (i) Explain the method of measuring the isolating property of a capacitor by relevant bridge circuits. (10)

(ii) Describe in detail about the various data acquisition systems. (6)

14.

(a)

(i) Discuss in detail about the accuracy and resolution in DVM. (8)

(ii) Discuss briefly about the working of IEEE 488 bus. (8)

(or)

(b) Explain in detail about the following items with neat diagram.

(i) Frequency Counter (8)

(ii) Data Logger (8)

15.

(a) Sketch the basic block diagram for a digital storage oscilloscope and explain the operation. (16)

(or)

(b) With a neat diagram, explain the architecture of virtual instrumentation and discuss its application in various fields. (16)