Government College of Engineering, Amravati
(An Autonomous Institute of Government of Maharashtra)

Sixth Semester B. Tech.
(Electronics and Telecommunication)

Summer – 2016

Course Code: ETU603

Course Name: Electronic Measurements

Time: 2 Hrs. 30 Min. **Max. Marks: 60**

Instructions to Candidate

1) All questions are compulsory.
2) Assume suitable data wherever necessary and clearly state the assumptions made.
3) Diagrams/sketches should be given wherever necessary.
4) Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5) Figures to the right indicate full marks.

1. Solve the Following

a) i) In general, what are the static characteristics of an instrument? Explain. **04**

ii) A 600 V voltmeter is specified to be accurate within ±2% at full scale. Calculate the limiting error when the instrument is used to measure a voltage of 250V. **02**

b) By giving an example, explain the principle of successive approximation analog-to-digital (A/D) converter. **06**

2. **Solve any TWO** 12

a) What are the different types of errors? Giving example of each, State the three types of systematic errors.

b) Explain the working principle of Q-meter. Also outline the factors that cause errors during a Q measurement.

c) With the aid of block diagram explain staircase-Ramp Digital Voltmeter (DVM).

3. **Solve any TWO** 12

a) With the aid of neat diagram explain phase sensitive detector (or phase meter) for comparing an AC with reference signal.

b) Using analog schematic and operational detail, explain any one type of analog frequency meter also discuss its applications.

c) Draw the block diagram of digital LCR meter and explain the function of each block.

4. **Solve any TWO** 12

a) With the help of neat functional block diagram and typical attenuation curve explain audio range wave analyzer.

b) List the various types of printer. Explain any one of them with suitable diagram.

c) With the appropriate block diagram of the vertical section of an oscilloscope, explain vertical deflection system.

5. **Solve the Following** 12

a) Draw the simplified block diagram of random noise generator and explain the function of each block. Also sketch its frequency response curve.

b) Draw the block diagram of digital storage oscilloscope and explain the function of each block. And Write any two applications of oscilloscope.

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1 Solve any two of the following questions

(a) Write short note on **6m**
1) Static characteristics
2) Dynamic characteristics

(b) What are the different types of error. Explain in detail. **6m**

(c) A set of independent current measurements was taken by six observers and recorded as 12.8 mA, 12.2mA, 12.5mA, 13.1mA, 12.9mA and 12.4mA. Calculate (a) the arithmetic mean (b) the deviation from the mean. **6m**

Contd..

2. Solve the following:

(a) How digital signal is converted into analog signal. Explain with the help of any one DAC converter. **6m**

(b) Explain any one type of digital voltmeter with block diagram. **6m**

3. Solve any two of the following questions

(a) Explain in detail frequency meter. **6m**

(b) How phase measurement is done by voltage addition method. Explain. **6m**

(c) What are the advantages and disadvantages of digital phase meter. **6m**

4. Answer the following

(a) Explain audio frequency generators with required diagram. **6m**

(b) Explain pulse generators with required diagram. **6m**

5. (a) Solve any two of the following questions.

What do you mean by digital recorders and printers. Explain. **6m**

(b) How the deflection of cathode ray beam is done. Explain with necessary diagram. **6m**

(c) Draw the block diagram of Digital storage oscilloscope and explain its working. **6m**