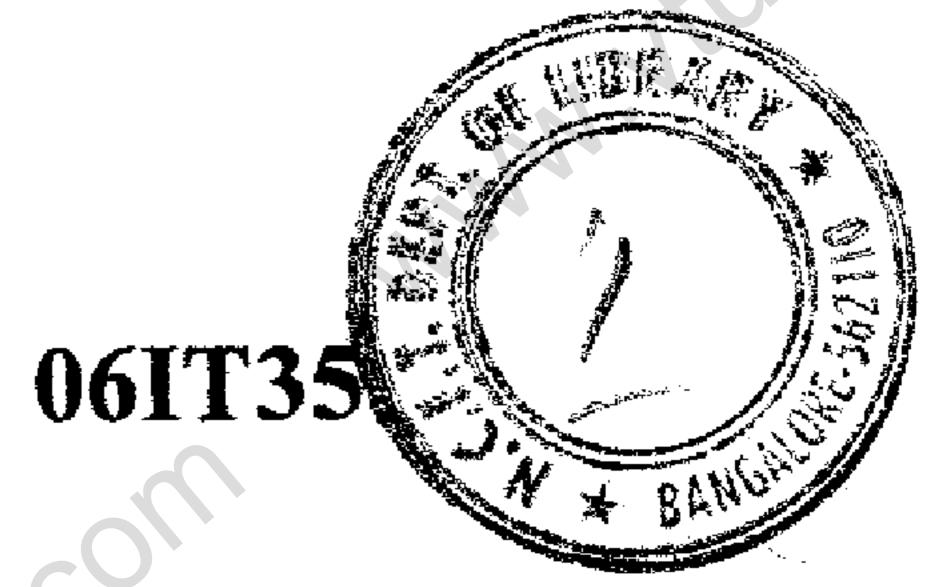## Third Semester B.E. Degree Examination, Dec. 07 / Jan. 08
Electronic Instrumentation

Time: 3 hrs.

Max. Marks:100

Note : *Answer any FIVE full questions.*

1 a. Define the following terms as applied to an electronic instrument:
   i) Accuracy   ii) Precision   iii) Resolution.   (06 Marks)
   b. Explain the working of a true RMS voltmeter with the help of a suitable block diagram.
                                                                                          (08 Marks)
   c. Determine the value of the multiplier resistance on the 50 V range of a dc voltmeter, that
      uses a 250 μA meter movement with an internal resistance of 100 Ω.   (06 Marks)

2 a. Discuss the advantages of a digital voltmeter over an analog voltmeter.   (04 Marks)
   b. Explain the working of a digital frequency meter with the help of a block diagram.
                                                                                          (10 Marks)
   c. Determine the resolution of a 3½ digit display on 1 V and 10 V ranges.   (06 Marks)

3 a. Draw the basic block diagram of an oscilloscope. Explain the functions of each block.
                                                                                          (08 Marks)
   b. Describe the following modes of operation available in a dual trace oscilloscope:
      i) ALTERNATE mode   ii) CHOP mode.   (06 Marks)
   c. Explain the operation of an electronic switch with the help of a block diagram.   (06 Marks)

4 a. Explain why time delay is necessary in oscilloscopes.   (04 Marks)
   b. Explain the operation of a digital storage oscilloscope with the help of a block diagram.
      Mention the advantages.   (10 Marks)
   c. Write an explanatory note on sampling oscilloscopes.   (06 Marks)

5 a. Explain the operation of a conventional standard signal generator with the help of a block
      diagram. Mention the applications.   (08 Marks)
   b. Explain the operating principle of a function generator with the help of a block diagram.
                                                                                          (08 Marks)
   c. Describe briefly any one application of sweep frequency generator.   (04 Marks)

6 a. A highly sensitive galvanometer can detect a current as low as 0.1 nA. This galvanometer
      is used in a Wheatstone Bridge as a detector. Each arm of the bridge has a resistance of
      1 kΩ. The input voltage applied to the bridge is 20 V. Calculate the smallest change in
      resistance, which can be detected assuming the resistance of the galvanometer is
      negligible.   (06 Marks)
   b. Explain the operation of the Wien's Bridge with a neat circuit diagram. Derive the
      expression for the frequency.   (08 Marks)
   c. Write a note on Wagner's earth connection.   (06 Marks)

7 a. Distinguish between active and passive transducers with an example.   (04 Marks)
   b. A 120 Ω strain gage with a gage factor of 2 is affixed to a metal bar. The bar is stretched
      and this causes a change in resistance of 0.001 Ω. Find the change in length if the original
      length was 10 cm.   (06 Marks)
   c. Describe the different types of thermistor.   (04 Marks)
   d. Explain the working principle of a photo cell with an application.   (06 Marks)

8 a. Compare LED and LCD types of displays.   (06 Marks)
   b. Explain how power is measured using a bolometer, with a suitable diagram.   (08 Marks)
   c. Write a short note on signal conditioning system.   (06 Marks)

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