



**NBX-003-027404** Seat No. \_\_\_\_\_

**M. Sc. (ECI) (Sem. IV) (CBCS) Examination**

**April / May - 2017**

**Paper - 16 : Basic Instrumentation**

**Faculty Code : 003**

**Subject Code : 027404**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

**1** Answer the following questions in brief: (any Seven) **14**

1. Enlist various static characteristics of an instrument.
2. For the set of five observations given below calculate arithmetic mean, deviations of each value and standard deviation.

$$a_1 = 21.4, a_2 = 21.9, a_3 = 23.0, a_4 = 20.7, a_5 = 21.4.$$

3. Classify printers into various categories.
4. Enlist the requirements of shunt.
5. Design an Ayrton shunt to provide an ammeter with current ranges of 0-1mA, 0-10mA, 0-50mA and 0-100mA. Internal resistance of the movement is  $100\ \Omega$  and Full scale deflection current is  $50\ \mu\text{A}$ .
6. Write a brief note on average responding AC voltmeter
7. Enlist techniques to measure high frequency.
8. Define resolution and sensitivity of a digital meter.
9. Draw the block diagram of CRO.
10. Write a brief note on dual beam CRO.

**2** Attempt any two of the following questions. (Each 7 Marks) **14**

1. Give a detailed account on dynamic characteristics of an instrument. Describe dynamic response of a first order system.
2. Give a detailed account on Series type OHM meter.
3. Draw the circuit for measurement of frequency and explain working of it.

- 3** Answer the following questions.
1. Write a detailed note on various static errors. **5**
  2. Explain working of an AC volt meter using half wave rectifier. **5**
  3. Describe various modes of operation of electronic counters. **4**

**OR**

- 3** Answer the following questions :
1. Write a detailed note on character of a time impact printer. **5**
  2. Explain construction and working of Digital tachometer. **5**
  3. Draw neat diagram of Typical CRT connections and explain the same. **4**
- 4** Answer the following questions :
1. Write a note on staircase ramp type DVM. **5**
  2. Describe True RMS voltmeter in depth. **5**
  3. Explain in detail working of light emitting diode. **4**
- 5** Answer any two of the following questions : **14**  
(Each of 7 Marks)
1. Write a detailed note on electrodynamic meters.
  2. With neat diagram explain working of a chopper type voltmeter.
  3. Describe in detail successive approximation type ADC for DVM.
  4. With help of neat diagram explain basic principle of signal display on CRO. Also explain various triggering modes.
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