



MBV-003-027404

Seat No. _____

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

April / May - 2018

Basic Instrumentation : Paper - 16

(Old Course)

Faculty Code : 003

Subject Code : 027404

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

[Total Marks : 70

- Instructions :** (1) All question are compulsory.
(2) Figures on right hand side indicate marks.

1 Answer the following : **10**

- (1) Define the term measurement and instrument.
- (2) What do you mean by standard ?
- (3) Give the types of systematic errors.
- (4) State the difference between accuracy and precision of a measurement.
- (5) What do you mean by Nixies ?

Whether the statement is true or false : **4**

- (1) Observational errors are errors introduced by the observer. (T/F)
- (2) The radiation emitted by LEDs can be either in the visible spectrum or in the infrared region. (T/F)
- (3) Analog meters, offer high accuracy, have high input impedance and are smaller in size. (T/F)
- (4) The CRO uses electrostatic method of focusing as compared to a TV picture tube which employs electromagnetic focusing. (T/F)

2 Answer the following : (any **two**)

(1) Define the following terms : **7**

- (i) Arithmetic mean
- (ii) Deviation from the mean
- (iii) Average deviation
- (iv) Standard deviation

For the following given data, calculate :

- (i) Arithmetic mean
- (ii) Deviation from each value
- (ii) Algebraic sum of the deviation

Given $X_1 = 49.7$, $X_2 = 50.1$, $X_3 = 50.2$, $X_4 = 49.6$, $X_5 = 49.7$

- (2) (a) Discuss the types of static errors in details and also give the sources of error. 4
- (b) Give the classification of standards. What are the differences between International and absolute standards ? 3
- (3) Give the types of instruments which are mainly used as ammeters and voltmeters ? Explain the basic principle of a D'Arsonval movement. 7
- 3** Answer the following :
- (1) Give the classification of display. Explain liquid crystal display. 5
- (2) Write notes on light emitting diodes. (LED) 5
- (3) Discuss about Liquid Vapour Display. 4
- OR**
- 3** Answer the following :
- (1) What type of movement is used for an ammeter ? Discussed about dc ammeter and Multi range ammeters. 5
- (2) Write note on transistor voltmeter (TVM). 5
- (3) Explain the working of chopper type dc amplifier voltmeter. 4
- 4** Answer the following : (any two)
- (1) State the advantages of a DVM over an analog meter. Explain the operating principle of a Ramp type DVM. 7
- (2) Discuss the Microprocessor-Based ramp type DVM. 7
- (3) What are the basic components of a digital system ? Explain the operation of a basic digital multi meter. 7
- 5** Answer the following : (any two)
- (1) Describe an overview of application of a CRO. Draw the internal structure of CRT and describe the different parts of CRT in brief. 7
- (2) Draw the basic block diagram of an oscilloscope and explain the function of each block. 7
- (3) On what principle does a digital frequency meter operate ? Explain with the help of a neat diagram the working of a digital frequency meter. 7
- (4) Give the applications of signal generator. Which types of waveforms can be generated by signal generator ? Draw the block diagram of a function generator and explain the method of producing sine waves. 7