Sub Code	**:**	**06IT35**
IA Marks	**:**	**25**
Hrs/ Week	**:**	**04**
Exam Hours		

:

03

Total Hrs.

:

52

□

Exam Marks

:

100

PART – A

UNIT – 1:

Introduction

(a) Measurement Errors: Gross errors and systematic errors, Absolute and relative errors, Accuracy, Precision, Resolution and Significant figures. (Text 2: 2.1 to 2.3)

(b) Voltmeters and Multimeters Introduction, Multirange voltmeter, Extending voltmeter ranges, Loading, AC voltmeter using Rectifiers – Half wave and full wave, Peak responding and True RMS voltmeters. (Text 1: 4.1, 4.4 to 4.6, 4.12 to 4.14, 4.17, 4.18)

07 Hours

UNIT – 2:

Digital Instruments

Digital Voltmeters – Introduction, DVM's based on V – T, V – F and Successive approximation principles, Resolution and sensitivity, General specifications, Digital Multi-meters, Digital frequency meters, Digital measurement of time(Text 1: 5.1 to 5.6; 5.9 and 5.10; 6.1 to 6.4)

07 Hours

UNIT – 3:

Oscilloscopes

Introduction, Basic principles, CRT features, Block diagram and working of each block, Typical CRT connections, Dual beam and dual trace CROs, Electronic switch(Text 1: 7.1 to 7.9, 7.12, 7.14 to 7.16)

06 Hours

UNIT – 4:

Special Oscilloscopes

Delayed time-base oscilloscopes, Analog storage, Sampling and Digital storage oscilloscopes(Text 2: 10.1 to 10.4)

06 Hours

PART – B

UNIT – 5:

Signal Generators

Introduction, Fixed and variable AF oscillator, Standard signal generator, Laboratory type signal generator, AF sine and Square wave generator, Function generator, Square and Pulse generator, Sweep frequency generator, Frequency synthesizer(Text 1: 8.1 to 8.9 and Text 2: 11.5, 11.6)

06 Hours

UNIT – 6:

Measurement of resistance, inductance and capacitance

Whetstone's bridge, Kelvin Bridge; AC bridges, Capacitance Comparison Bridge, Maxwell's bridge, Wein's bridge, Wagner's earth connection (Text 1: 11.1 to 11.3, 11.8, 11.9, 11.11, 11.14 and 11.15)

07 Hours

UNIT – 7:

Transducers - I

Introduction, Electrical transducers, Selecting a transducer, Resistive transducer, Resistive position transducer, Strain gauges, Resistance thermometer, Thermistor, Inductive transducer, Differential output transducers and LVDT, (Text 1: 13.1 to 13.11)

07 Hours

UNIT – 8:

Miscellaneous Topics

(a) Transducers - II –Piezoelectric transducer, Photoelectric transducer, Photovoltaic transducer, Semiconductor photo devices, Temperature transducers-RTD, Thermocouple (Text 1: 13.15 to 13.20)

(b) Display devices: Digital display system, classification of display, Display devices, LEDs, LCD displays(Text 1: 2.7 to 2.11)

(c) Bolometer and RF power measurement using Bolometer (Text 1: 20.1 to 20.9)

(d) Introduction to Signal conditioning(Text 1: 14.1)

06 Hours

TEXT BOOKS:

1. **"Electronic Instrumentation",** H. S. Kalsi, TMH, 2004

2. **"Electronic Instrumentation and Measurements",** David A Bell, PHI / Pearson Education, 2006.

REFERENCE BOOKS:

1. **"Principles of measurement systems",** John P. Beately, 3rd Edition, Pearson Education, 2000

2. **"Modern electronic instrumentation and measuring techniques",** Cooper D & A D Helfrick, PHI, 1998.

3. **"Electronic and Electrical measurements and Instrumentation",** J. B. Gupta, S. K. Kataria & Sons, Delhi

4. **Electronics & electrical measurements,** A K Sawhney, , Dhanpat Rai & sons, 9th edition.

Question Paper Pattern: Student should answer FIVE full questions out of 8 questions to be set each carrying 20 marks, **selecting at least TWO questions from each part**

Coverage in the Texts:

UNIT – 1: (a) Text 2: 2.1 to 2.3; **(b)** Text 1: 4.1, 4.4 to 4.6, 4.12 to 4.14, 4.17, 4.18

UNIT – 2: Text 1:5.1 to 5.6; 5.9 and 5.10; 6.1 to 6.4

UNIT – 3: Text 1: 7.1 to 7.9, 7.12, 7.14 to 7.16

UNIT – 4: Text 2: 10.1 to 10.5

UNIT – 5: Text 1: 8.1 to 8.9 and Text 2: 11.5, 11.6

UNIT – 6: Text 1: 11.1 to 11.3, 11.8, 11.9, 11.11, 11.14 and 11.15

UNIT – 7: Text 1: 13.1 to 13.11

UNIT – 8: (a) Text 1: 13.15 to 13.20.2 (b) Text 1: 2.7 to 2.12 (c) Text 1: 20.1 to 20.9, (d) Text 1: 14.1