

equation, one dimensional heat and wave equations
[7 hours]

Unit-VIII: DIFFERENCE EQUATIONS AND Z-TRANSFORMS

Difference equations: Basic definition; Z-transforms – definition, standard Z-transforms, damping rule, shifting rule, initial value and final value theorems. Inverse Z-transform. Application of Z-transforms to solve difference equations.

[6 hours]

Note: * In the case of illustrative examples, questions are not to be set.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Latest edition, Khanna Publishers
2. Erwin Kreyszig, Advanced Engineering Mathematics, Latest edition, Wiley Publications.

Reference Book:

1. B.V. Ramana, Higher Engineering Mathematics, Latest edition, Tata Mc. Graw Hill Publications.
2. Peter V. O’Neil, Engineering Mathematics, CENGAGE Learning India Pvt Ltd. Publishers

**ELECTRONIC CIRCUITS
(Common to CSE & ISE)**

**Subject Code: 10CS32
Hours/Week : 04**

**I.A. Marks : 25
Exam Hours: 03**

PART - A**UNIT - 1****7 Hours**

Transistors, UJTs, and Thyristors: Operating Point, Common-Emitter Configuration, Thermal Runaway, Transistor Switch, Unijunction Transistors, SCR.

UNIT - 2**6 Hours**

Field Effect Transistors: Bipolar Junction Transistors versus Field Effect Transistors, Junction Field Effect Transistors, Metal Oxide Field Effect Transistors, Differences between JFETs and MOSFETs, Handling MOSFETs, Biasing MOSFETs, FET Applications, CMOS Devices, Insulated Gate Bipolar Transistors (IGBTs)

UNIT - 3**6 Hours**

Optoelectronic Devices: Introduction, Photosensors, Photoconductors, Photodiodes, Phototransistors, Light-Emitting Diodes, Liquid Crystal Displays, Cathode Ray Tube Displays, Emerging Display Technologies, Optocouplers

UNIT - 4**7 Hours**

Small Signal Analysis of Amplifiers: Amplifier Bandwidth: General Frequency Considerations, Hybrid h-Parameter Model for an Amplifier, Transistor Hybrid Model, Analysis of a Transistor Amplifier using complete h-Parameter Model, Analysis of a Transistor Amplifier Configurations using Simplified h-Parameter Model (CE configuration only), Small-Signal Analysis of FET Amplifiers, Cascading Amplifiers, Darlington Amplifier, Low-Frequency Response of Amplifiers (BJT amplifiers only).

PART - B**UNIT - 5****6 Hours**

Large Signal Amplifiers, Feedback Amplifier: Classification and characteristics of Large Signal Amplifiers, Feedback Amplifiers: Classification of Amplifiers, Amplifier with Negative Feedback, Advantages of Negative Feedback, Feedback Topologies, Voltage-Series (Series-Shunt) Feedback, Voltage-Shunt (Shunt-Shunt) Feedback, Current-Series (Series-Series) Feedback, Current-Shunt (Shunt-Series) Feedback.

UNIT - 6**7 Hours**

Sinusoidal Oscillators, Wave-Shaping Circuits: Classification of Oscillators, Conditions for Oscillations: Barkhausen Criterion, Types of Oscillators, Crystal Oscillator, Voltage-Controlled Oscillators, Frequency Stability.

Wave-Shaping Circuits: Basic RC Low-Pass Circuit, RC Low-Pass Circuit as Integrator, Basic RC High-Pass Circuit, RC High-Pass Circuit as Differentiator, Multivibrators, Integrated Circuit (IC) Multivibrators.

UNIT - 7

7 Hours

Linear Power Supplies, Switched mode Power Supplies: Linear Power Supplies: Constituents of a Linear Power Supply, Designing Mains Transformer; Linear IC Voltage Regulators, Regulated Power Supply Parameters.

Switched Mode Power Supplies: Switched Mode Power Supplies, Switching Regulators, Connecting Power Converters in Series, Connecting Power Converters in Parallel.

UNIT - 8

6 Hours

Operational Amplifiers: Ideal Opamp versus Practical Opamp, Performance Parameters, Some Applications: Peak Detector Circuit, Absolute Value Circuit, Comparator, Active Filters, Phase Shifters, Instrumentation Amplifier, Non-Linear Amplifier, Relaxation Oscillator, Current-To-Voltage Converter, Voltage-To-Current Converter, Sine Wave Oscillators.

Text Book:

1. Anil K Maini, Varsha Agarwal: Electronic Devices and Circuits, Wiley, 2009.
(4.1, 4.2, 4.7, 4.8, 5.1 to 5.3, 5.5, 5.6, 5.8, 5.9, 5.13, 5.14, 6.1, 6.3, 7.1 to 7.5, 7.10 to 7.14, Listed topics only from 8, 10.1, 11, 12.1, 12.2, 12.3, 12.5, 13.1 to 13.6, 13.9, 13.10, 14.1, 14.2, 14.6, 14.7, 15.1, 15.5 to 15.7. 16.3, 16.4, 17.12 to 17.22)

Reference Books:

1. Jacob Millman, Christos Halkias, Chetan D Parikh: Millman's Integrated Electronics – Analog and Digital Circuits and Systems, 2nd Edition, Tata McGraw Hill, 2010.
2. R. D. Sudhaker Samuel: Electronic Circuits, Sanguine-Pearson, 2010.

LOGIC DESIGN (Common to CSE & ISE)

Subject Code: 10CS33

Hours/Week : 04

Total Hours : 52

I.A. Marks : 25

Exam Hours: 03

Exam Marks: 100

PART-A