1. Stages of electronics development.
2. History of electronics
3. Signals, their classification, parameters, the discrete and continuous spectrum of signals.
4. Types of signals
5. Basic circuit elements: voltage sources, current sources, resistors, inductors, and capacitors.
6. Unilateral and Bilateral elements, circuits
7. Active circuit elements
8. Voltage sources and Current Sources
9. Passive circuit elements
10. Resistance and Resistors in electronics
11. Linear electronic circuits
12. Linear circuit elements
13. Dependent and Independent Electric Sources
14. Series and Parallel connections
15. Techniques of Circuit Analysis.
16. The Phasor. Phasor Diagrams.
17. Impedance and Reactance. Admittance.
18. Ohm’s Law
19. Basic Laws of Electronics
20. The Node-Voltage Method. The Mesh-Current Method.
21. Kirchhoff's laws.
22. Applying Ohm's Law and Kirchhoffs Laws to Find an Unknown Current.
23. Nonlinear circuits, analysis graphical method, load line, regime on a constant current.
24. Metals, insulators and semiconductors.
25. Electrons and holes in semiconductors.
26. Recombination processes
27. Carrier Generation and Recombination.
28. *p-n* junction and its properties.
29. Consideration of properties of p-n junction
30. Types of semiconductor diodes
31. Understanding the p-n junction
32. *I-V* characteristics of diodes
33. Formation and Properties of Junction Diode
34. Semiconductor diodes, Zener diodes, Tunnel diodes.
35. Light-Emitting Diodes. Light-Sensitive Diodes.
36. Solar Cells. Circuit Applications of Ordinary Diodes.
37. Transistors, its properties and types
38. Bipolar Junction Transistors (BJT). Ideal transistor model.
39. Application of transistors in electronics
40. Analyze BJT band diagrams and understand current gain, base transport factor, and emitter injection efficiency.
41. Common emitter (CE) Fixed bias configuration.
42. Voltage divider bias, Emitter follower.
43. Common Base (CB) configuration. Collector feedback configuration.
44. I-V characteristics of transistors in different configurations.
45. Transistor Frequency Response: General frequency considerations, low frequency response.
46. The field-effect transistors. Junction Field Effect Transistor (JFET)– N-channel and P-channel.
47. Metal Oxide Semiconductor FET (MOSFET).
48. Amplifiers. Types of amplifiers.
49. Basic amplifiers specifications.
50. Operational Amplifiers.
51. Ideal Amplifier Approximation.
52. Non-inverting Amplifiers.
53. Inverting Amplifiers.
54. Differential Amplifiers.
55. Feedback Amplifier: Feedback concept, Feedback connections type, Practical feedback circuits. Design procedures for the feedback amplifiers.
56. Application of Amplifiers
57. Oscillator operation, Phase shift Oscillator.
58. Wienbridge Oscillator.