

Tick one box per statement: ☐ not yet ☐ nearly ☐ confident.

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1. Circuit Analysis I (DC)

I ()

1.1 Quantities, units and measurement

☐☐☐ Quantities, units and measurement

1.2 Ohm’s law and Kirchhoff’s laws

☐☐☐ Ohm’s law and Kirchhoff’s laws

1.3 Nodal and mesh analysis

☐☐☐ Nodal and mesh analysis

1.4 Source transformations and network theorems

☐☐☐ Source transformations and network theorems

1.5 Ideal operational amplifiers

☐☐☐ Ideal operational amplifiers

1.6 Capacitors, inductors and energy

☐☐☐ Capacitors, inductors and energy

1.7 First-order RC and RL response

☐☐☐ First-order RC and RL response

2. Mathematical Methods for EE

2.1 Calculus review for signals

☐☐☐ Calculus review for signals

2.2 Complex numbers and phasor algebra

☐☐☐ Complex numbers and phasor algebra

2.3 Linear algebra essentials

☐☐☐ Linear algebra essentials

2.4 Ordinary differential equations

☐☐☐ Ordinary differential equations

2.5 Laplace transforms

☐☐☐ Laplace transforms

2.6 Fourier series

☐☐☐ Fourier series

2.7 Probability and random variables

☐☐☐ Probability and random variables

2.8 Vector calculus

☐☐☐ Vector calculus

3. Digital Logic Design

3.1 Number representations and codes

☐☐☐ Number representations and codes

3.2 Boolean algebra and Karnaugh maps

☐☐☐ Boolean algebra and Karnaugh maps

3.3 Combinational building blocks

☐☐☐ Combinational building blocks

3.4 Latches and flip-flops

☐☐☐ Latches and flip-flops

3.5 Finite state machines

☐☐☐ Finite state machines

3.6 Registers, counters and memory

☐☐☐ Registers, counters and memory

3.7 HDL and verification basics

☐☐☐ HDL and verification basics

4. Circuit Analysis II (AC)

II ()

4.1 Sinusoidal steady state and phasors

☐☐☐ Sinusoidal steady state and phasors

4.2 AC power and three-phase

☐☐☐ AC power and three-phase

4.3 Second-order RLC circuits

☐☐☐ Second-order RLC circuits

4.4 Resonance

[□□□ Resonance](#)

4.5 Filters and Bode plots

[□□□ Filters and Bode plots](#)

4.6 Laplace circuit analysis

[□□□ Laplace circuit analysis](#)

4.7 Two-port networks

[□□□ Two-port networks](#)

5. Electronics I

I

5.1 Semiconductors and diode models

[□□□ Semiconductors and diode models](#)

5.2 Rectifiers and dc supplies

[□□□ Rectifiers and dc supplies](#)

5.3 BJT biasing

[□□□ BJT biasing](#)

5.4 MOSFET biasing

[□□□ MOSFET biasing](#)

5.5 Small-signal amplifiers

[□□□ Small-signal amplifiers](#)

5.6 Op-amp feedback circuits

[□□□ Op-amp feedback circuits](#)

5.7 Frequency response of amplifiers

[□□□ Frequency response of amplifiers](#)

6. Signals and Systems

6.1 Signal representations and system properties

[□□□ Signal representations and system properties](#)

6.2 LTI systems and convolution

[□□□ LTI systems and convolution](#)

6.3 Fourier series and transforms

[□□□ Fourier series and transforms](#)

6.4 Sampling

[□□□ Sampling](#)

6.5 Laplace transform and system functions

[□□□ Laplace transform and system functions](#)

6.6 Discrete-time systems

[□□□ Discrete-time systems](#)

6.7 The z-transform Z

[□□□ The z-transform](#)

7. Electromagnetics

7.1 Vector field tools

[□□□ Vector field tools](#)

7.2 Electrostatics

[□□□ Electrostatics](#)

7.3 Magnetostatics

[□□□ Magnetostatics](#)

7.4 Maxwell's equations

[□□□ Maxwell's equations](#)

7.5 Plane waves

[□□□ Plane waves](#)

7.6 Transmission lines

[□□□ Transmission lines](#)

7.7 Waveguides and antennas

[□□□ Waveguides and antennas](#)

8. Microprocessors and Embedded Systems

8.1 Microcontroller architecture

[□□□ Microcontroller architecture](#)

8.2 Embedded C and assembly [C](#)

[□□□ Embedded C and assembly](#)

8.3 Memory and I/O [/](#)

☐☐☐ Memory and I/O

8.4 Interrupts and timers

☐☐☐ Interrupts and timers

8.5 Serial protocols (UART, SPI, I2C) (UART, SPI, I2C)

☐☐☐ Serial protocols (UART, SPI, I2C)

8.6 ADC, DAC and sensors ,

☐☐☐ ADC, DAC and sensors

8.7 Debugging and integration

☐☐☐ Debugging and integration

9. Electrical Machines and Power Systems

9.1 Magnetic circuits and transformers

☐☐☐ Magnetic circuits and transformers

9.2 DC machines

☐☐☐ DC machines

9.3 Induction machines

☐☐☐ Induction machines

9.4 Synchronous machines

☐☐☐ Synchronous machines

9.5 Power networks

☐☐☐ Power networks

9.6 Per-unit system and power flow

☐☐☐ Per-unit system and power flow

9.7 Power electronics introduction

☐☐☐ Power electronics introduction

10. Control Systems

10.1 Modelling of dynamic systems

☐☐☐ Modelling of dynamic systems

10.2 Transfer functions and block diagrams

☐☐☐ Transfer functions and block diagrams

10.3 Time-domain response

☐☐☐ Time-domain response

10.4 Routh stability

☐☐☐ Routh stability

10.5 Root locus

☐☐☐ Root locus

10.6 Bode and Nyquist analysis

☐☐☐ Bode and Nyquist analysis

10.7 PID control and compensation PID

☐☐☐ PID control and compensation

10.8 State-space introduction

☐☐☐ State-space introduction

11. Communication Systems

11.1 Signals, spectra and bandwidth ,

☐☐☐ Signals, spectra and bandwidth

11.2 Amplitude modulation

☐☐☐ Amplitude modulation

11.3 Angle modulation (FM/PM) (/)

☐☐☐ Angle modulation (FM/PM)

11.4 Noise and SNR

☐☐☐ Noise and SNR

11.5 PCM and baseband transmission

☐☐☐ PCM and baseband transmission

11.6 Digital modulation

☐☐☐ Digital modulation

11.7 Information and coding introduction

☐☐☐ Information and coding introduction

12. Digital Signal Processing

12.1 Discrete-time signals and systems review

☐☐☐ Discrete-time signals and systems review

12.2 DTFT and DFT

☐☐☐ DTFT and DFT

12.3 The FFT

☐☐☐ The FFT

12.4 FIR filter design FIR

☐☐☐ FIR filter design

12.5 IIR filter design IIR

☐☐☐ IIR filter design

12.6 Multirate processing

☐☐☐ Multirate processing

12.7 Signal-processing project

☐☐☐ Signal-processing project