Sub Code

:

06EC46

IA Marks

:

25

Hrs/ Week

:

04

Exam Hours

:

03

Total Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT 1:

Operational Amplifier Fundamentals: Basic Op-Amp circuit, Op-Amp parameters – Input and output voltage, CMRR and PSRR, offset voltages and currents, Input and output impedances, Slew rate and Frequency limitations; Op-Amps as DC Amplifiers- Biasing Op-Amps, Direct coupled -Voltage Followers, Non-inverting Amplifiers, Inverting amplifiers, Summing amplifiers, Difference amplifier. (Text 1: Chapter 1 – 1.2, Chapter 2 – 2.1, 2.2, 2.3, 2.4, 2.5, and Chapter 3 – 3.1, 3.2, 3.3, 3.4, 3.5, 3.6)

7 Hours

UNIT 2:

Op-Amps as AC Amplifiers: Capacitor coupled Voltage Follower, High input impedance - Capacitor coupled Voltage Follower, Capacitor coupled Non-inverting Amplifiers, High input impedance - Capacitor coupled Non-inverting Amplifiers, Capacitor coupled Inverting amplifiers, setting the upper cut-off frequency, Capacitor coupled Difference amplifier, Use of a single polarity power supply.

(Text 1: Chapter 4)

6 Hours

UNIT 3:

Op-Amps frequency response and compensation: Circuit stability, Frequency and phase response, Frequency compensating methods, Band width, Slew rate effects, Z

in

Mod compensation, and circuit stability precautions.

(

Text 1: Chapter 5 – 5.1, 5.2, 5.3, 5.5, 5.6, 5.9, 5.10)

6 Hours

UNIT 4:

OP-AMP Applications: Voltage sources, current sources and current sinks, Current amplifiers, instrumentation amplifier, precision rectifiers, Limiting circuits, (Text 1: Chapter 6 – 6.1, 6.2, 6.4, 6.8, and Chapter 7 – 7.1, 7.2, 7.3)

7 Hours

PART – B

UNIT 5:

More applications: Clamping circuits, Peak detectors, sample and hold circuits, V to I and I to V converters, Log and antilog amplifiers, Multiplier and divider, Triangular / rectangular wave generators, Wave form generator design, phase shift oscillator, Wein bridge oscillator. (Text 1: Chapter 7 – 7.4, 7.5, 7.6; Chapters 10 -10.1, 10.2, 10.3, 10.5; Text 2: Sections 4.5, 4.8 and 4.9)

6 Hours

UNIT 6:

Non-linear circuit applications: crossing detectors, inverting Schmitt trigger circuits, Monostable & Astable multivibrator, Active Filters –First and second order Low pass & High pass filters.

(
Text 1: Chapter 9 – 9.2, 9.3, 9.5, 9.6; Chapter 11 – 11.2, 11.3, 11.4, 11.5)

7 Hours

UNIT 7:

Voltage Regulators: Introduction, Series Op-Amp regulator, IC Voltage regulators, 723 general purpose regulator, Switching regulator. (Text 2:

Chapter 6)

6 Hours

UNIT 8:

Other Linear IC applications: 555 timer - Basic timer circuit, 555 timer used as astable and monostable multivibrator, Schmitt trigger; PLL-operating principles, Phase detector / comparator, VCO; D/A and A/ D converters – Basic DAC Techniques, AD converters(Text 2: Chapter 8 – 8.1, 8.2, 8.3, 8.4, 8.5; Chapter 9 – 9.1, 9.2, 9.3, 9.4; Chapter 10 – 10. 1, 10.2, 10.3 ; Except 8.3.1, 8.4.1, 10.2.5, 10.4)

7 Hours

TEXT BOOKS:

1. **"Operational Amplifiers and Linear IC's",** David A. Bell**,** 2nd edition,

PHI/Pearson, 2004

2. **"Linear Integrated Circuits",** D. Roy Choudhury and Shail B. Jain**,** 2nd edition, Reprint 2006, New Age International

REFERENCE BOOKS:

1. **"Op - Amps and Linear Integrated Circuits",** Ramakant A. Gayakwad, 4th edition, PHI,

2. **"Operational Amplifiers and Linear Integrated Circuits",** Robert. F. Coughlin & Fred.F. Driscoll **,** PHI/Pearson, 2006

3. **"Op - Amps and Linear Integrated Circuits",** James M. Fiore**,** Thomson Learning, 2001

4. **"Design with Operational Amplifiers and Analog Integrated Circuits",** Sergio Franco **,** TMH, 3e, 2005

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 Text books:

UNIT 1: (Text 1: Chapter 1 – 1.2, Chapter 2 – 2.1, 2.2, 2.3, 2.4, 2.5,

and Chapter 3 – 3.1, 3.2, 3.3, 3.4, 3.5, 3.6)

UNIT 2: Text 1: Chapter 4

UNIT 3: Text 1: **(**Text 1: Chapter 5 – 5.1, 5.2, 5.3, 5.5, 5.6, 5.9, 5.10)

UNIT 4: (Text 1: Chapter 6 – 6.1, 6.2, 6.4, 6.8, and Chapter 7 – 7.1, 7.2, 7.3)

UNIT 5: (Text 1: Chapter 7 – 7.4, 7.5, 7.6; Chapters 10 -10.1, 10.2, 10.3, 10.5;

Text 2: Sections 4.5, 4.8 and 4.9)

UNIT 6: Text 1: Chapter 9 – 9.2, 9.3, 9.5, 9.6; Chapter 11 – 11.2, 11.3, 11.4, 11.5

UNIT 7: Text 2: Chapter 6

UNIT 8: Text 2: Chapter 8 – 8.1, 8.2, 8.3, 8.4, 8.5; Chapter 9 – 9.1, 9.2, 9.3, 9.4;

Chapter 10 – 10. 1, 10.2, 10.3; Except 8.3.1, 8.4.1, 10.2.5, 10.4