

KAKATIYA UNIVERSITY - WARANGAL - TELANGANA

Under Graduate Courses (Under CBCS 2019– 2022)

B.Sc. ELECTRONICS II Year

SEMESTER – IV

LINEAR INTEGRATED CIRCUITS & BASICS OF COMMUNICATION

PAPER – IV:: (DSC-4: Compulsory)

Theory: 4 Hours/Week Credits: 4 Marks: 100 (Internal: 20; External: 80)
Practical: 3 Hours/Week Credits: 1 Marks: 25

UNIT – I

Operational Amplifiers (Op-Amp): Emitter Coupled Differential amplifier, Block diagram of Op-Amp, Characteristics of Op-Amp, Op-Amp Parameters: Input resistance, Output resistance, Common mode rejection ratio (CMRR), Slew rate, Offset voltages, Input bias current, Basic Op-Amp circuits: Inverting Op-Amp, Virtual ground, Non-inverting Op-Amp, Frequency response of Op-Amp, Op-Amp as: summing amplifier, subtractor, comparator, voltage follower, integrator and differentiator.

UNIT – II

Applications of Op-Amps: Logarithmic amplifier, Sine wave (Wien Bridge) generator and square wave (Astable) generator, Triangular wave generator, Monostable multivibrator, Solving of simple second order differential equations, Basic Op-Amp series regulator and shunt regulator, IC 555 Timer (Block diagram and its working), IC 555 as monostable and astable multivibrator.

UNIT – III

Modulation: Need for modulation- Types of modulation- Amplitude, Frequency and Phase modulation.
Amplitude modulation: Analysis of Amplitude modulation, side bands, modulation index, AM modulator, Balanced modulator, Demodulation – diode detector.

UNIT – IV

Frequency modulation: Analysis of FM. Working of simple frequency modulator, detection of FM waves: FM Discriminator, Advantages of frequency modulation, AM and FM Transmitters and radio receivers (Block diagram approach), Introduction to PAM, PPM, PWM, PCM, Delta modulation.

Suggested Books:

1. Op amps and linear Integrated Circuits – Ramakant Gayakwad, PHI
2. Linear Integrated Circuits - Coughlin and Driscoll
3. Linear Integrated Circuits - D Roy Choudhury and Shail B Jain
4. Electronic Communication Systems-George Kennedy & Bernard Davis
5. Principles of Electronic Communication Systems-Louis E Freznel, TMH

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PRACTICALS**

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Practical: 3 Hours/Week Credits: 1 Marks: 25

Using IC 741 Op-Amp and IC 555 Timer:

1. Op amp as inverting Amplifier- Determination of Gain (With AC and DC)
2. Op amp as non-inverting Amplifier- Determination of Gain (With AC and DC)
3. OP Amp as Summing amplifier and comparator (Zero crossing detector)
4. Astable multivibrator – determination of time period and duty cycle.
5. Monostable multivibrator- determination of gate width.
6. Integrator/ Differentiator – study of wave forms.
7. Astable multivibrator using IC 555
8. Monostable multivibrator using IC 555.
9. AM modulator and detector
10. FM modulator and detector

Simulation of all the above experiments:

1. Inverting and Non inverting amplifiers and comparator
2. Integrator/ Differentiator using op amp
3. Wein's bridge oscillator
4. Astable multivibrator using Op Amp
5. Astable multivibrator using IC 555

Note: Student has to perform minimum of six experiments

- 1) Lab manual for Electronic Devices and Circuits – 4th Edition. By David A Bell – PHI
- 2) Basic Electronics – A Text Lab Manual –Zbar, Malvino, Miller.

SCHEME OF QUESTION PAPER

**B.Sc. (Electronics)
Internal Assessment Examination - I
Semester: I/II/III/IV/V/VI
Paper:
(For DSC, DSE, GE & Paper in lieu of project)**

Time: 90 Min]

[Marks: 20

Answer ALL questions. Each question carries equal marks (2 x 10 = 20)

1. From Unit 1
2. From Unit 1
3. From Unit 1
4. From Unit 1
5. From Unit 1
6. From Unit 2
7. From Unit 2
8. From Unit 2
9. From Unit 2
10. From Unit 2

SCHEME OF QUESTION PAPER

KAKATIYA UNIVERSITY, WARANGAL
B.Sc. (ELECTRONIC) I/II/III Year Examination

Semester: I/II/III/IV/V/VI

Paper:

(For DSC, DSE, GE & Paper in lieu of project)

Time: 3 Hours]

[Marks: 80

SECTION A: SHORT ANSWER QUESTIONS (8 X 4 = 32)

Answer Any EIGHT questions. Each question carries equal marks

1. From Unit 1
2. From Unit 1
3. From Unit 1 (Problem)
4. From Unit 2
5. From Unit 2
6. From Unit 2 (Problem)
7. From Unit 3
8. From Unit 3
9. From Unit 3 (Problem)
10. From Unit 4
11. From Unit 4
12. From Unit 4 (Problem)

SECTION B: ESSAY TYPE ANSWER QUESTIONS (4 X 12 = 48)

Answer Any FOUR questions. All questions carry equal marks

13. (a) From Unit 1
OR
(b) From Unit 1
14. (a) From Unit 2
OR
(b) From Unit 2
15. (a) From Unit 3
OR
(b) From Unit 3
16. (a) From Unit 4
OR
(b) From Unit 4