PRACTICE SET

End Semester (III Sem.) Examination, Dec 2025

Course: Analog Electronics Circuits
Semester: III
Program: B.Tech-CSE
Course Code: 3ECS201

Course Outcomes	Description
CO1	The ability to understand the characteristics of transistors.
CO2	Design and analyse various rectifier and amplifier circuits.
CO3	Design sinusoidal and non-sinusoidal oscillators.

Program: B.Tech

Subject: Analog Electronic Circuits

Subject Code: 3ECS201

Section A **(No. of Question 22x 5= 110 Marks)**

1. Define Insulator, Conductor and Semiconductor. What do you mean by intrinsic and extrinsic semiconductor? [CO1, Unit 1, BTL LOT, Remember]

2. What do you mean by a diode? Describe its working principle.

[CO2, Unit -1, BTL LOT, Understand]

3. Explain the operation of a clipper and a clamper circuit.

[CO2, Unit 1, BTL LOT, Understand]

4. What is Zener diode? Draw its symbol and equivalent circuit.

[CO2, Unit 1, BTL LOT, Understand]

5. Why transistor is called so? Discuss its amplifying action?

[CO1, Unit 2, BTL LOT, Apply]

6. Briefly explain the working mechanism of a bipolar junction transistor for its normal operation.

[CO1, Unit 2, BTL LOT, Apply]

7. Demonstrate different configurations of BJT with neat and labelled diagram.

[CO1, Unit 2, BTL LOT, Apply]

8. Draw and discuss a current mirror circuit.

[CO1, Unit 2, BTL LOT, Understand]

9. Define the following with reference to a MOSFET

[CO1, Unit 3, BTL LOT, Remember]

a. Source and Drain
b. Gate and Channel

10. Describe MOSFET as a switch.

[CO2, Unit 3, BTL LOT, Understand]

11 Explain the small signal modal of MOSFET [CO3, Unit 3, BTL LOT, Apply]

12. What is Op-Amp? Draw the internal structure of an operational amplifier.

[CO3, Unit 4, BTL LOT, Understand]

13. Enumerate the characteristics of an Ideal Op-Amp

[CO2, Unit 4, BTL LOT, Remember]

14. Define a power amplifier. Give its types with features.

[CO3, Unit 4, BTL LOT, Understand]

15. Draw and discuss the working of a direct Coupled multistage amplifier.

[CO2, Unit 4, BTL LOT, Understand]

16. Define multi-stage amplifier.

[CO2, Unit 5, BTL LOT, Understand]

17. Draw the circuit of an Inverting op-amp. Deduce its gain also.

[CO2, Unit 5, BTL LOT, Remember]

18. What is Comparator?

[CO3, Unit 5, BTL LOT, Understand]

19. Describe ADC.

[CO3, Unit 5, BTL LOT, Understand]

20. Define hysteretic comparator. [CO2, Unit 6, BTL LOT, Understand]

21. Define a zero crossing detector [CO2, Unit 6, BTL LOT, Understand]

22. Describe a precision rectifier. [CO2, Unit 6, BTL LOT, Understand]

Section B **(No. of Question 13x10= 130 Marks)**

23. Sketch the diagram of a full wave bridge rectifier and give its working.

[CO2, Unit 1, BTL LOT, Apply]

24. Compare a full wave rectifier and a half wave rectifier based on at least five parameters.

[CO2, Unit 1, BTL HOT, Analyze]

25. Describe a BJT in common Base configuration and draw its input and output characteristics.

[CO1, Unit 2, BTL LOT, Understand]

26. Compare common base, common emitter and common collector BJTs**.**

[CO1, Unit 2, BTL HOT, Analyze]

27. Explain basic construction and operation of an N-Channel MOSFET with its I-V Characteristics

[CO1, Unit 3, BTL LOT, Understand]

28. Design the small signal modal of MOSFET. [CO1, Unit 3, BTL HOT, Create]

29. What are the advantages of the differential amplifier? Also mention its some of the applications.

[CO2, Unit 4, BTL LOT, Apply]

30. Define a power amplifier. Give its types with features.

[CO2, Unit 4, BTL HOT, Understand]

31. Describe: (a) CMRR (b) Slew Rate (c) Bandwidth (d) Gain (e) Output offset voltage.

[CO3, Unit 5, BTL LOT, Understand]

32. Draw and describe op-amp as a summer circuit [CO2, Unit 5, BTL HOT, Create]

33. What is non-inverting Operational amplifier?Draw its circuit and give its gain.

[CO2, Unit 5, BTL LOT, Apply]

34. Appraise with at least two non- linear applications of Op-Amp.

[CO2, Unit 6, BTL HOT, Evaluate]

35. Discuss the working of Monoshot. [CO3, Unit 6, BTL LOT, Understand]

Section C **(No. of Question 5x 20= 100 Marks)**

36. (i) Explain the formation of a PN Junction and define depletion layer

    (ii) Draw and discuss the IV Characteristic of a diode.

    [CO1, Unit 1, BTL HOT, Analyze]

37. (i) Explain the working of BJT in CE configuration mode with its input and output characteristics

    (ii) Design the high frequency equivalent circuit of BJT.

    [CO1, Unit 2, BTL HOT, Create]

38. a. Differentiate between Inverting and non-inverting amplifier

    c. Discuss at least two non-idealities in operational amplifier

    [CO2, Unit 4, BTL HOT, Analyze]

39. What is an oscillator? Explain its principle, types, and operation of a Wien Bridge oscillator with circuit diagram. [CO3, Unit 5, BTL HOT, Create]

40. Construct and discuss the operation of a sawtooth wave generator using op-amp.

    [CO3, Unit 4, BTL HOT, Create]

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Summary Sheet:

CO Wise

CO	Q. No	Marks
CO1	1, 5, 6, 7, 8, 9, 25, 27, 26, 36, 37	100
CO2	2, 3, 4, 10, 13, 15, 16, 17, 20, 21, 22, 23, 24, 26, 29, 30, 32, 33, 34,, 38	155
CO3	11, 12, 14, 18, 19, 31, 35, 39, 40	85
Total		**340**

Unit Wise

Unit	Q. No	Marks
Unit 1	1, 2, 3, 4, 23, 24, 36	60
Unit 2	5, 6, 7, 8, 25, 26, 37	60
Unit 3	9, 10, 11, 27, 28	35
Unit 4	12, 13, 14, 15, 29, 30, 38	60
Unit 5	16, 17, 18, 19, 31, 32, 33, 39	70
Unit 6	20, 21, 22, 34, 35, 40	55
Total		**340**

Blooms Taxonomy Level (BTL) Wise

BTL	Q. No	Marks
LOT	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21,22, 23,25,27,29,31,33,35	180
HOT	24, 26, 28, 30, 32, 34, 36, 37, 38, 39, 40	160
Total		**340**

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Disclaimer: -This is a Practice Set. The Question in End term examination will differ from the Practice Set. This Practice Set is meant for practice only.