

**THE KAVERY ENGINEERING COLLEGE***(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS NOV/DEC 2025***Third Semester**Electronics and Communication Engineering***EC3353 - Electronic Devices and Circuits***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10\*2=20)**

| <i>Q.No</i> | <i>Questions</i>                                                                             | <i>BTL</i> | <i>CO</i> | <i>Marks</i> |
|-------------|----------------------------------------------------------------------------------------------|------------|-----------|--------------|
| 1.          | Define depletion region.                                                                     | L1         | 1         | 2            |
| 2.          | Draw the VI characteristics of PN junction diode.                                            | L2         | 1         | 2            |
| 3.          | A BJT has a base current of 200 $\mu$ A. Determine the collector current and $\beta$ .       | L1         | 2         | 2            |
| 4.          | Draw the diode equivalent model of a transistor.                                             | L2         | 2         | 2            |
| 5.          | CMRR of an amplifier is 100 dB, estimate common mode gain, if the differential gain is 1000. | L2         | 3         | 2            |
| 6.          | Why neutralization is important? And mention its types.                                      | L1         | 3         | 2            |
| 7.          | What is the advantage of a Colpitts oscillator compared to a phase shift oscillator?         | L2         | 4         | 2            |
| 8.          | Point out the characteristics of an amplifier which are modified by negative feedback.       | L1         | 4         | 2            |
| 9.          | Draw the characteristics of power MOSFET.                                                    | L1         | 5         | 2            |
| 10.         | Compare Class A, Class B and Class C amplifiers.                                             | L2         | 5         | 2            |

**PART - B (ANSWER ALL QUESTIONS) (Marks 5\*16 = 80)**

| <i>Q.No</i> | <i>Questions</i>                                                                                   | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|----------------------------------------------------------------------------------------------------|------------|-----------|--------------|
| 11.         | a i Examine the construction and working principle of Zener diode with a neat sketch.              | L4         | 1         | 8            |
|             | ii Explain how Zener diode can acts as a voltage regulator.                                        | L4         | 1         | 8            |
|             | Or                                                                                                 |            |           |              |
|             | b i Derive the expression for a ripple factor in a half wave bridge rectifier with resistive load. | L4         | 1         | 8            |
|             | ii Show how can it be used to design full wave bridge rectifier.                                   | L4         | 1         | 8            |
| 12.         | a With neat diagram explain the input and output characteristics of a CE transistor configuration. | L3         | 2         | 16           |
|             | Or                                                                                                 |            |           |              |
|             | b Explain the construction and working of Depletion mode and Enhancement mode MOSFET.              | L3         | 2         | 16           |

|     |     |                                                                                                                                                                  |    |   |    |
|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|----|
| 13. | a   | Describe the common mode and differential mode analysis of differential amplifier and determine its CMRR.                                                        | L4 | 3 | 16 |
|     |     | Or                                                                                                                                                               |    |   |    |
|     | b   | Describe the working principle of single tuned amplifier with neat circuit diagram and analyze its gain and frequency response.                                  | L4 | 3 | 16 |
| 14. | a   | With neat block diagram, explain the operation of following feedback amplifiers.<br>i. Voltage series feedback amplifier<br>ii. Current shunt feedback amplifier | L3 | 4 | 16 |
|     |     | Or                                                                                                                                                               |    |   |    |
|     | b i | Derive the expressions for the frequency of oscillation and the condition for maintenance of oscillation.                                                        | L3 | 4 | 8  |
|     | ii  | Explain the operation of Phase shift Oscillator with neat diagram.                                                                                               | L3 | 4 | 8  |
| 15. | a   | Illustrate the Buck converter and Boost converter with necessary diagrams and derive the expressions for voltage and current.                                    | L2 | 5 | 16 |
|     |     | Or                                                                                                                                                               |    |   |    |
|     | b   | Explain the input-output behavior, waveforms, and efficiency of a Class AB transformer amplifier                                                                 | L2 | 5 | 16 |