



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi &amp; Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade &amp; Recognized Under Section 2(f) &amp; 12(B) of the UGC act, 1956

II B.Tech I Sem Supply End Examination, July-2022

**ANALOG ELECTRONICS**

(EEE)

**Max. Marks: 70**

- Note: 1. Question paper consists: Part-A and Part-B.  
 2. In Part – A, answer all questions which carries 20 marks.  
 3. In Part – B, answer any one question from each unit.  
 Each question carries 10 marks and may have a, b as sub questions.

**PART- A****(10\*2 Marks = 20 Marks)**

- |       |  |    |     |     |
|-------|--|----|-----|-----|
| 1. a) | What are the advantages of fixed biasing circuit?  | 2M | C01 | BL1 |
| b)    | Draw the circuit diagram of full wave rectifier with L-section filter  | 2M | C01 | BL1 |
| c)    | How Hybrid-pi parameters vary with temperature   | 2M | C02 | BL1 |
| d)    | Why are n-channel MOSFETs preferred over P-channel MOSFET  | 2M | C02 | BL1 |
| e)    | Show that the voltage gain increases with cascading  | 2M | C03 | BL1 |
| f)    | What is the significance of DC Coupling?   | 2M | C03 | BL1 |
| g)    | Write advantages of negative feedback in amplifier?  | 2M | C04 | BL1 |
| h)    | Classify different types of oscillator.  | 2M | C04 | BL1 |
| i)    | What are ideal characteristics of operational amplifier.   | 2M | C05 | BL1 |
| j)    | A differential dc amplifier has a differential mode gain of 100 and a common mode gain 0.01. What is its CMRR in dB? | 2M | C05 | BL3 |

**PART- B****(10\*5 Marks = 50 Marks)**

- |   |    |  |    |     |     |
|---|----|--|----|-----|-----|
| 2 | a) | Explain input and output characteristics of a transistor in CB configuration | 5M | C01 | BL4 |
|   | b) | Explain Small signal equivalent circuit of CE amplifier                      | 5M | C01 | BL4 |

**OR**

- |   |    |   |     |     |     |
|---|----|---|-----|-----|-----|
| 3 |    | In half-wave rectifier an ac voltage of peak value 24V is connected in series with silicon diode and load resistance of 480Ω. If the forward resistance of the diode is 20Ω, find average load current and rms value of load current. | 10M | C01 | BL3 |
| 4 | a) | Distinguish between JFET and MOSFET   | 5M  | C02 | BL2 |
|   | b) | Draw the high frequency equivalent circuit of MOSFET  | 5M  | C02 | BL1 |

**OR**

- |   |  |   |     |     |     |
|---|--|---|-----|-----|-----|
| 5 |  | Explain the V-I characteristics of MOSFET | 10M | C02 | BL4 |
|---|--|---|-----|-----|-----|

- |           |  |     |     |     |
|-----------|--|-----|-----|-----|
| 6         | a) Compare the three types of coupling methods used in multistage amplifiers   | 5M  | C03 | BL2 |
|           | b) Discuss about the effect of cascading on bandwidth of multistage amplifiers   | 5M  | C03 | BL2 |
| <b>OR</b> |  |     |     |     |
| 7         | Draw a neat circuit diagram of push pull class B amplifier. Explain its working  | 10M | C03 | BL4 |
| 8         | a) Draw the diagram of Colpitt's oscillator and explain its working  | 5M  | C04 | BL4 |
|           | b) What are the factors that affects the frequency stability of an oscillator? How frequency stability can be improved in oscillators?   | 5M  | C04 | BL1 |
| <b>OR</b> |  |     |     |     |
| 9         | Draw the circuit diagram of current shunt feedback and derive expressions for input and output resistance  | 10M | C04 | BL6 |
| 10        | a) Draw & explain the circuit of a summing operational amplifier using inverting amplifier configuration.  | 5M  | C05 | BL4 |
|           | b) Explain the terms (i) slew rates (ii) CMRR (iii) PSRR (iv) drift and list out ideal and practical characteristics of above parameters.  | 5M  | C05 | BL4 |
| <b>OR</b> |  |     |     |     |
| 11        | The two input terminals of an op-amp are connected to voltage signals of strength $745\mu\text{V}$ and $740\mu\text{V}$ respectively. The gain of the OP-AMP in differential mode is $5 \times 10^5$ and its CMRR is 80dB. Calculate the output voltage and percentage error due to common mode. | 10M | C05 | BL3 |

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