CBCS SCHEME

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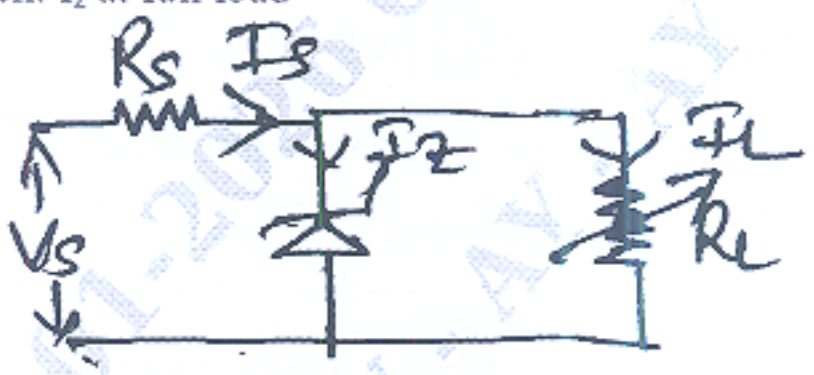
BESCK104C

ACHARYA INSTITUTE OF TECHNOLOGY MCA Library Date BANGALORE

# First Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
# Introduction to Electronics and Communication

Time: 3 hrs. Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.*
*2. M : Marks , L: Bloom's level , C: Course outcomes.*

| | | Module – 1 | M | L | C |
|---|---|---|---|---|---|
| Q.1 | a. | Draw the block diagram of Regulated power supply and mention the function of each block. | 8 | L2 | CO1 |
| | b. | An amplifier produces an output voltage of 4V from an input of 100mV. If the i/p and output current in this condition are 2mA and 100mA respectively. Find : i) Voltage gain ii) Current gain iii) Power gain. | 6 | L3 | CO1 |
| | c. | What is a Rectifier? With neat circuit diagram and output waveforms, explain half wave rectifier with capacitor filter. | 6 | L2 | CO1 |
| | | OR | | | |
| Q.2 | a. | Explain the concept of Negative feedback amplifier with neat diagram and relevant equation. | 5 | L2 | CO1 |
| | b. | 5 V stabilized power supply is required to be produced from a 12 V DC power supply input source. The maximum power rating of the zener diode is 2W. Using zener regulator circuit shown in Fig Q2(b). Calculate :<br>i) Maximum current flowing through zener diode<br>ii) Minimum value of series resistor<br>iii) Load current if a load resistor of 1kΩ connected across zener diode<br>iv) Zener current $I_z$ at full load<br>  <br><br>Fig Q2(b) | 8 | L3 | CO1 |
| | c. | List and explain various types of amplifiers. | 7 | L2 | CO1 |
| | | Module – 2 | | | |
| Q.3 | a. | With circuit diagram, explain the operation of an wien bridge oscillator. | 8 | L2 | CO2 |
| | b. | Explain the following with respect to operational amplifier.<br>i) Non inverting amplifier<br>ii) Differentiator | 8 | L2 | CO2 |
| | c. | List out the Ideal characteristics of op amp? | 4 | L1 | CO2 |

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|---|---|---|---|---|---|
| | | **OR** | | | |
| Q.4 | a. | With a neat circuit diagram, explain the operation of RC phase shift oscillator. | 8 | L2 | CO2 |
| | b. | Explain the operation of single stage Astable multi-vibrator with its circuit diagram. | 8 | L2 | CO2 |
| | c. | Define the following parameter of op amp i) CMRR ii) Slew Rate. | 4 | L1 | CO2 |
| | | **Module – 3** | | | |
| Q.5 | a. | Convert the following :<br>i) $5369_{(10)} = (?)_2 = (?)_8$ ii) $10110001101011.11110010_{(2)} = (?)_{16}$<br>iii) $1010.011_{(2)} = (?)_{10}$ iv) $5678_{(10)} = (?)_{16}$ v) $3FCD_{(16)} = (?)_2 = (?)_{16}$ | 10 | L3 | CO3 |
| | b. | Simplify the following Boolean functions :<br>i) $Y = A\overline{B} + AB$ ii) $Y = (A + B)(A + C)$ iii) $F = Y[(X + \overline{Y})(Y + Z)]$<br>iv) $Z = B(A + C) + C$ v) $F = A + \overline{A}B$ | 10 | L3 | CO3 |
| | | **OR** | | | |
| Q.6 | a. | Define Full Adder. Explain full adder using two half adders and one OR gate. Write the equation for sum and $C_{out}$. | 8 | L2 | CO3 |
| | b. | Write the step by step procedure to design a combinational circuit. | 4 | L2 | CO3 |
| | c. | Subtract the following using 1's and 2's complement method :<br>i) $(110010 - 11001)_2$ ii) $(1001 - 10000)_2$ | 8 | L3 | CO3 |
| | | **Module – 4** | | | |
| Q.7 | a. | What is an embedded system? Compare embedded system with general purpose computer systems. | 8 | L1 | CO4 |
| | b. | Explain 7 segment LED display. | 6 | L2 | CO4 |
| | c. | Write a short notes on : i) Transducers ii) Sensors. | 6 | L2 | CO4 |
| | | **OR** | | | |
| Q.8 | a. | Write the difference between RISC and CISC processors. | 6 | L2 | CO4 |
| | b. | List out the major applications areas of embedded systems. | 6 | L1 | CO4 |
| | c. | Discuss the elements of typical embedded systems. | 8 | L2 | CO4 |
| | | **Module – 5** | | | |
| Q.9 | a. | What are the advantages of Digital communication over Analog communication? | 5 | L1 | CO5 |
| | b. | With neat block diagram of basic communication system, explain the individual blocks. | 8 | L2 | CO5 |
| | c. | Define Noise and explain the various kinds of noise. | 7 | L2 | CO5 |
| | | **OR** | | | |
| Q.10 | a. | Mention the need for modulation. | 4 | L1 | CO5 |
| | b. | Write a short notes on : i) ASK ii) FSK. | 6 | L2 | CO5 |
| | c. | Explain Amplitude and frequency modulation. Sketch AM and FM waveforms. | 10 | L2 | CO5 |

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