



Academic year 2022-2023 (Odd Sem)

|   |            |               |          |
|---|------------|---------------|----------|
| Academic year 2022-2023 (Odd)             |            |               |          |
| DEPARTMENT OF                             |            |               |          |
| Electronics and Communication Engineering |            |               |          |
| Date                                      | March 2023 | Maximum Marks | 60       |
| Course Code                               | 22ES14C    | Duration      | 110 Mins |
| Sem                                       | I Semester | CIE 3         |          |
| PRINCIPLES OF ELECTRONICS ENGINEERING     |            |               |          |

Instructions to candidates:

- Part A must be answered within the first two pages of manuscript.
- Assume the suitable data for missing values

|        |  | M | BT | CO |
|--------|--|---|----|----|
| PART-A |  | 1 | 1  | 2  |
| 1      | Convert the binary number $(1010101)_2$ to octal.  | 1 | 1  | 1  |
| 2      | One's complement of 1011 is _____.   | 1 | 2  | 2  |
| 3      | The Hexadecimal equivalent of $(536)_8$ is _____.  | 1 | 2  | 2  |
| 4      | Represent octal number $(321)_8$ and find its decimal equivalent.  | 1 | 1  | 1  |
| 5      | In an AM system, the modulating frequency is 10KHz and the modulation index is 0.9. The required bandwidth is _____.   | 2 | 3  | 3  |
| 6      | The total power delivered by an AM wave is 2640Watts. If the modulation index=0.8, the power in each side band=_____.  | 1 | 2  | 1  |
| 7      | The frequency to which the incoming signal is changed in super heterodyne receiver is called _____ frequency.  | 1 | 2  | 1  |
| 8      | In an AM modulation, a carrier signal of 1MHz is modulated by a sine wave of 600Hz and the depth of modulation is 70%. The transmission efficiency is _____.   | 1 | 1  | 1  |
| 9      | The device which converts energy from one form to another form is called _____.  |   |    |    |
| PART-B |  | 4 | 2  | 2  |
| 1.a    | Subtract the given number using 2's complement Method<br>i. $(9)_{10} - (7)_{10}$<br>ii. $(3)_{10} - (6)_{10}$   | 6 | 2  | 2  |
| b      | Perform the Following:<br>i. Convert $(475.25)_8$ to its decimal equivalent<br>ii. Convert $(3509)_{10}$ to its hexadecimal equivalent   | 5 | 1  | 3  |
| 2a     | What is modulation and explain the need for modulation.  | 5 | 3  | 1  |
| 2b     | Draw the block diagram of a general communication system and explain the each block in detail.   | 5 | 2  | 2  |
| 3a     | A carrier of 2MHz has 1kW of its power amplitude modulated with a sinusoidal signal of 2KHz. The depth of modulation is 60%. Calculate the sideband frequencies, the signal bandwidth, the power in the sidebands and the total power in the modulated wave. | 5 | 3  | 4  |
| 3b     | Draw the digital communication block diagram and explain the function of each block in detail.   | 4 | 2  | 1  |
| 4a     | Differentiate between RISC and CISC architecture.  | 6 | 3  | 3  |
| 4b     | With the help of block diagram, explain the working of super heterodyne receiver   | 4 | 2  | 3  |
| 5a     | Explain the following with examples:<br>i. Active Sensor<br>ii. Passive Sensor   | 6 | 1  | 3  |
| 5b     | Explain the working principle of the following sensors and mention its   |   |    |    |

## Academic year 2022-2023 (Odd Sem)

applications.

- i. Humidity Sensor
- ii. Ultrasonic Sensor

## BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

| Marks<br>Distribution | Particulars |              | CO1 | CO2 | CO3 | CO4 | L1 | L2 | L3 | L4 | L5 |
|-----------------------|-------------|--------------|-----|-----|-----|-----|----|----|----|----|----|
|                       | Quiz        | Max<br>Marks | 5   | 3   | 2   | -   | 4  | 4  | 2  | -  | -  |
|                       | Test        | Max<br>Marks | 11  | 23  | 16  | -   | 16 | 19 | 15 | -  | -  |