CBCS SCHEME

USN | | | | | | | | | | BESCK104C/ BESCKC104

# First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
## 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. *VTU Formula Hand Book is permitted.*
3. *M : Marks , L: Bloom's level , C: Course outcomes.*

| | | Module – 1 | M | L | C |
|---|---|---|---|---|---|
| Q.1 | a. | Draw the block diagram of DC power supply and explain the individual blocks. | 8 | L2 | CO1 |
| | b. | Draw the circuit diagram of voltage regulation and explain the operation. | 6 | L2 | CO1 |
| | c. | An amplifier produces an output voltage of 2V for an input of 50mV. If the input and output currents in this condition are 4mA and 200mA respectively. Find :<br>i) The voltage gain ii) The current gain iii) The power gain. | 6 | L3 | CO1 |
| | | **OR** | | | |
| Q.2 | a. | With a neat circuit diagram and waveform. Explain the working operation of a full wave bridge rectifier. | 8 | L2 | CO1 |
| | b. | Draw the circuit diagram of voltage doubler and the working operation. | 6 | L2 | CO1 |
| | c. | Discuss briefly a Negative feedback amplifier with block diagram. | 6 | L1 | CO1 |
| | | **Module – 2** | | | |
| Q.3 | a. | With circuit diagram, explain the operation of an wien bridge oscillator. | 8 | L2 | CO2 |
| | b. | Define the following operational amplifier parameters value.<br>i) Open loop voltage gain<br>ii) Output Resistance<br>iii) Slew Rate. | 6 | L1 | CO2 |
| | c. | Draw the circuit diagram and input and output waveform of the following operational amplifier circuits<br>i) Differentiators ii) Integrator. | 6 | L1 | CO2 |
| | | **OR** | | | |
| Q.4 | a. | Explain the single state astable oscillator with circuit diagram. | 8 | L1 | CO2 |
| | b. | What is oscillator? And mention condition for oscillations. | 6 | L1 | CO2 |
| | c. | Explain the operation of summing amplifier using operational amplifier and write the output equation. | 6 | L2 | CO2 |

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| | | **Module – 3** | | | |
| **Q.5** | **a.** | Implement full adder using two half adders and one OR gate. Write the equations for Sum and $C_{out}$. | **8** | **L3** | **CO3** |
| | **b.** | Convert the following numbers to its equivalent numbers and show the steps.<br>i) $(10110001101011.111100000)_2 = (?)_8$<br>ii) $(10110001101011.11110010)_2 = (?)_{16}$<br>iii) $(1010.011)_2 = (?)_{10}$ | **6** | **L2** | **CO3** |
| | **c.** | Using basic Boolean theorems prove<br>i) $(x + y)(x + z) = x + yz$ ii) $xy + xz + y\bar{z} = xz + y\bar{z}$ | **6** | **L3** | **CO3** |
| | | **OR** | | | |
| **Q.6** | **a.** | Express the Boolean function<br>i) $F = A + \bar{B}C$ in a sum of minterms form<br>ii) $F = xy + \bar{x}z$ in a product of maxterms form. | **8** | **L2** | **CO3** |
| | **b.** | Subtract the following using 10's complement<br>i) $(72532 - 3250)_{10}$ ii) $(3250 - 72532)_{10}$ | **6** | **L2** | **CO3** |
| | **c.** | Write the step by step procedure to design a combinational circuit. | **6** | **L1** | **CO3** |
| | | **Module – 4** | | | |
| **Q.7** | **a.** | What is an Embedded system? Compare Embedded systems with general computer systems. | **8** | **L2** | **CO4** |
| | **b.** | Mention the classification of Embedded system based on complexity and performance. | **6** | **L1** | **CO4** |
| | **c.** | Write a short note on – 7-segment LED display. | **6** | **L2** | **CO4** |
| | | **OR** | | | |
| **Q.8** | **a.** | Discuss the typical embedded system elements. | **8** | **L2** | **CO4** |
| | **b.** | What is the difference between RISC and CISC processors? | **6** | **L1** | **CO4** |
| | **c.** | Write a short note on : i) Transducers ii) Sensors. | **6** | **L2** | **CO4** |
| | | **Module – 5** | | | |
| **Q.9** | **a.** | Draw the block diagram of basic communication system and briefly explain the individual blocks. | **10** | **L2** | **CO5** |
| | **b.** | Discuss the types of communication systems. | **5** | **L2** | **CO5** |
| | **c.** | List the advantages of digital communication over analog communication. | **5** | **L1** | **CO5** |
| | | **OR** | | | |
| **Q.10** | **a.** | Define Amplitude and Frequency modulation. Sketch AM and FM waveform. | **10** | **L1** | **CO5** |
| | **b.** | Write a short note on : Amplitude Shift Keying (ASK) modulator and demodulator. | **10** | **L2** | **CO5** |

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