

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 : 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. i) Open loop voltage gain ii) Output Resistance iii) Slew Rate.	6	L1	CO2
	c.	Draw the circuit diagram and input and output waveform of the following operational amplifier circuits 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

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. i) $(10110001101011.111100000)_2 = (?)_8$ ii) $(10110001101011.11110010)_2 = (?)_{16}$ iii) $(1010.011)_2 = (?)_{10}$	6	L2	CO3
	c.	Using basic Boolean theorems prove 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 i) $F = A + \bar{B}C$ in a sum of minterms form ii) $F = xy + \bar{x}z$ in a product of maxterms form.	8	L2	CO3
	b.	Subtract the following using 10's complement 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. $\Delta \nabla$	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

 $\Delta \nabla$

CBCS SCHEME

USN

4 H H 2 2 C S 1 8 A

BESCK204C

Second Semester B.E./B.Tech. Degree Examination, June/July 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. M : Marks, L: Bloom's level, C: Course outcomes.

Module - 1			M	L	C
Q.1	a.	What is Regulated Power Supply? With neat block diagram, explain the working of DC power supply. Also mention the principal components used in each block.	8	L2	CO1
	b.	What is an Amplifier? Explain the types of Amplifier.	4	L2	CO1
	c.	With neat circuit diagram and wave forms explain full wave bridge rectifier.	8	L2	CO1
OR					
Q.2	a.	What is Voltage Regulator? With neat circuit diagram, explain the operation of a voltage regulator using Zener diode.	7	L2	CO1
	b.	Mention the advantages of negative feedback in amplifier circuits. With relevant equations and diagram, explain the concept of negative feedback.	7	L2	CO1
	c.	What is Voltage Multiplier? With circuit diagram, explain the operation of voltage doubler.	6	L2	CO1
Module - 2					
Q.3	a.	What is Op - Amp? Explain the various parameters of Operational Amplifier.	7	L2	CO2
	b.	Sketch the circuits of each of the following based on the use of Op - amp along with input and output wave forms : i) Integrator ii) Voltage follower iii) Comparator.	7	L2	CO2
	c.	Explain the operation of three - stage ladder RC Network Oscillator with neat circuit diagram.	6	L2	CO2
OR					
Q.4	a.	Explain the Barkhausen criteria for Oscillations. In wein bridge oscillator if $C_1 = C_2 = 100 \text{ nF}$, determine the frequency of oscillations when $R_1 = R_2 = 1 \text{ k}\Omega$.	7	L3	CO2
	b.	Explain the operation of Single stage Astable multivibrator with its circuit diagram.	7	L2	CO2
	c.	Explain the Ideal characteristics of an Op - amp.	6	L2	CO2

Module – 3

Q.5	a.	Convert the following : i) $(1AD.EO)_{16} = (?)_{10}$ ii) $(37.625)_{10} = (?)_2$ iii) $(110100111001.110)_2 = (?)_8$ iv) $(345.AB)_{16} = (?)_{10}$	8	L3	CO3
	b.	State and prove De – Morgan's theorems with its truth table.	6	L2	CO3
	c.	Implement the following Boolean functions by using logic gates : i) $F_1 = xy' + x'z$ ii) $F_2 = x'y'z + x'yz + xy'$	6	L3	CO3

OR

Q.6	a.	Perform the following : i) $(1010100)_2 - (1000100)_2$ using 1's complement and 2's complement method. ii) $(4456)_{10} - (34234)_{10}$ using 9's complement and 10's complement method. $\begin{array}{r} 0001111 \\ 0010000 \\ \hline -29778 \end{array}$	8	L3	CO3
	b.	Implement full adder circuit with its truth table and write the expressions for sum and carry.	6	L3	CO3
	c.	Express the Boolean function $F = A + B'C$ in a sum of min terms.	6	L3	CO3

Module – 4

Q.7	a.	What is an Embedded system? Compare Embedded system and General computing system.	7	L2	CO4
	b.	Using suitable diagrams, explain Instrumentation and Control System.	7	L2	CO4
	c.	Discuss major application areas of Embedded systems with examples.	6	L2	CO4

OR

Q.8	a.	Write a note on Core of Embedded systems with its block diagram.	7	L2	CO4
	b.	Explain how 7 seg LED display can be used to display the data and write a brief note on operation of LED.	7	L2	CO4
	c.	Explain the classification of Embedded systems.	6	L2	CO4

Module – 5

Q.9	a.	Describe the blocks of Modern Communication System with neat block diagram.	8	L2	CO5
	b.	Explain with a neat diagram, the concept of Radio wave propagation and its different types.	7	L2	CO5
	c.	Explain different Multiple Access Techniques.	5	L2	CO5

OR

Q.10	a.	What is Modulation? Explain Amplitude Modulation (AM) and Frequency Modulation (FM), with neat waveforms.	8	L2	CO5
	b.	List the advantages of Digital Communication over Analog Communication.	6	L2	CO5
	c.	Explain the following with the help of waveforms : i) ASK ii) FSK iii) PSK.	6	L2	CO5
