

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BESCK104C

First Semester B.E./B.Tech. Degree Examination, June/July 2025 Introduction to Electronics and Communication

Time: 3 hrs.

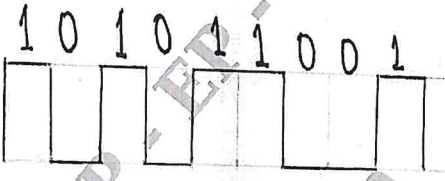
Max. Marks: 100

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.	Define the term rectifier. Explain the principle of working of full-wave bridge rectifier using a neat circuit diagram and waveforms.		7	L2	CO1
	b.	Discuss why negative feedback is used in amplifiers. Derive an expression for overall gain of an amplifier with negative feedback.		7	L2	CO1
	c.	A mains transformer having a turns ratio 44 : 1 is connected to a 220 V rms mains supply. If the secondary output is applied to a half wave rectifier, determine the peak voltage that will appear across a load.		6	L3	CO1
OR						
Q.2	a.	With a block diagram explain the working of a d.c. power supply. Also mention the major components used in each block.		7	L2	CO1
	b.	Explain with circuit diagram, the working of, (i) Voltage doubler (ii) Voltage tripler systems.		7	L2	CO1
	c.	An amplifier produces an output voltage of 2V for an input of 50 mV. If the input and output currents in this condition are, respectively, 4 mA and 200 mA, determine : (i) Voltage gain (ii) Current gain (iii) Power gain.		6	L3	CO1
Module – 2						
Q.3	a.	Draw the neat circuit diagram and accompanying waveforms of the following circuits using operational amplifier : (i) Voltage follower (ii) Differentiator (iii) Integrator		6	L1	CO2
	b.	Mention the conditions for sustained oscillations in an oscillator. Draw the circuit and provide the equations for output frequency of phase shift oscillator.		7	L2	CO2
	c.	With a neat circuit diagram and waveform, describe the operation of crystal controlled oscillator.		7	L2	CO2
OR						
Q.4	a.	What is an operational amplifier? Write a note on ideal characteristics of op-amp.		7	L2	CO2

	b.	Explain the operation of single stage astable oscillator with its circuit diagram.	7	L2	CO2
	c.	Determine the frequency of oscillations of a three stage ladder network in which $C = 10 \text{ nF}$ and $R = 10 \text{ K}\Omega$.	6	L3	CO2
Module – 3					
Q.5	a.	Mention different theorems and postulates of Boolean algebra and prove each of them with truth table.	7	L2	CO3
	b.	With the help of truth table, explain the operation of half adder with its circuit diagram and expressions for sum and carry.	5	L2	CO3
	c.	(i) Minimize the function : $F(x, y, z) = xy + x'z + yz$ (ii) Find the complement of : $F_1(x, y, z) = x'yz' + x'y'z$ $F_2(x, y, z) = x(yz' + yz')$ (iii) Compute the 1's complement of : 11101.0110 ₍₂₎	8	L3	CO3
OR					
Q.6	a.	With the help of truth table, explain the operation of full adder with its circuit diagram and expressions for sum and carry.	8	L2	CO3
	b.	State and prove De-Morgan's theorem with its truth table.	6	L2	CO3
	c.	Convert the following : (i) $(673.124)_{(8)} = (?)_{(16)}$ (ii) Subtract using $(r-1)$'s complement method : $72532_{(10)} - 3250_{(10)}$ (iii) Subtract using r 's complement method : $1010100_{(2)} - 1000100_{(2)}$	6	L3	CO3
Module – 4					
Q.7	a.	What is an embedded system? Compare embedded systems and general purpose computing systems.	7	L2	CO4
	b.	Which component forms the core of an embedded system? Compare a microcontroller and a microprocessor used in an embedded system.	6	L2	CO4
	c.	Define the term transducer, with a representative diagram, explain the working of any one type of sensor and an actuator.	7	L2	CO4
OR					
Q.8	a.	Write a brief note on a semiconductor LED. With a neat diagram explain how a 7-segment LED can be used to display the data.	7	L2	CO4
	b.	Using different features, describe the classification of embedded systems.	7	L2	CO4
	c.	With a block diagram, explain briefly about the different elements of an embedded system.	6	L2	CO4

Module – 5					
Q.9	a.	What is meant by modulation in communication systems? Briefly describe each type of modulation.	8	L2	CO5
	b.	Brief about basic communication system with its block diagram.	7	L2	CO5
	c.	Compare analog communication with digital communication systems.	5	L2	CO5
OR					
Q.10	a.	Explain with a neat diagram, the concept of Radio Wave propagation and its different types.	7	L2	CO5
	b.	Describe about radio signal transmission and multiple access techniques.	7	L2	CO5
	c.	Consider the following binary data and sketch the ASK, FSK and PSK modulated waveforms.	6	L3	CO5
		<p>1 0 1 0 1 1 0 0 1</p> <p>Digital Signal</p>  <p>Fig. Q10 (c)</p>			
