CBCS SCHEME

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BESCK104C

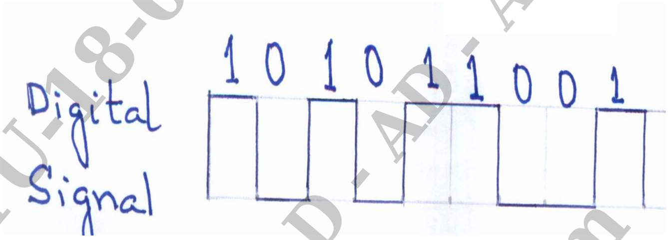
First Semester B.E./B.Tech. Degree Examination, June/July 2025
Introduction to Electronics and Communication

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 trippler 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 nF and R = 10 KΩ.	**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 : $F_1(x, y, z) = x'yz' + x'y'z$ $F_2(x, y, z) = x(y'z' + yz')$ (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 compliment method : $72532_{(10)} - 3250_{(10)}$ (iii) Subtract using r’s compliement 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.  Fig. Q10 (c)	**6**	**L3**	**CO5**

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