

First Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026 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.
3. VTU Formula Hand Book is permitted.*

Module – 1			M	L	C
Q.1	a.	With a neat block diagram, explain the working of a regulated DC power supply, clearly describing each stage.	8	L3	C01
	b.	With circuit diagram and waveforms, explain the working of Bi - Phase full wave rectifier.	6	L2	C01
	c.	With circuit diagram, brief out the operation of voltage doubler.	6	L2	C01
OR					
Q.2	a.	Derive an expression for the gain of an amplifier with negative feedback. Explain how feedback improves performance.	10	L3	C01
	b.	Write short notes on any four types of amplifiers with its frequency response curves.	6	L2	C01
	c.	An amplifier produces an output voltage of 5 V for an input of 85 mV. If the input and output currents in this condition are, respectively, 5 mA and 200 mA, determine the: (a) voltage gain (b) current gain (c) power gain.	4	L2	C01
Module – 2					
Q.3	a.	With a neat block diagram, derive the expression for overall gain of a positive feedback amplifier. Explain the conditions for sustained oscillations.	9	L3	C02
	b.	Explain the operation of three-stage ladder RC network oscillator with neat circuit diagram.	7	L2	C02
	c.	In wein bridge oscillator, if $C_1 = C_2 = 125\text{nF}$, determine the frequency of oscillation, When $R_1 = R_2 = 5\text{K}\Omega$.	4	L2	C02
OR					
Q.4	a.	Define the following with respect to operational amplifier and provide their typical values. (i) Open loop voltage gain (ii) Input offset voltage (iii) Slew Rate (iv) Full power Bandwidth	8	L2	C02
	b.	Explain the operation of an Op-Amp integrator and differentiator with circuit diagrams and output waveforms.	7	L2	C02

	c.	An operational amplifier with negative feedback produces an output voltage of 3V when supplied with an input of 450 μ V. Determine the value of closed – loop voltage gain and express the answer in decibels.	5	L3	C02
Module – 3					
Q.5	a.	Draw the block diagram of a communication system and explain the function of each block.	10	L2	C03
	b.	Explain the concept of noise and briefly the different types of radio wave propagation.	10	L2	C03
OR					
Q.6	a.	What are the advantages of digital communication over analog communication? Explain the generation of Amplitude Modulation (AM) with neat waveforms.	10	L2	C03
	b.	With waveforms, explain ASK, FSK, and PSK modulation schemes.	10	L2	C03
Module – 4					
Q.7	a.	Define embedded systems and list its key characteristics. Also list out the major application areas of embedded systems.	10	L2	C04
	b.	Discuss the purpose of embedded systems. Differentiate between embedded systems and general-purpose computing systems.	10	L2	C04
OR					
Q.8	a.	Explain the role of memory, sensors, actuators, and display devices (LED and 7-segment) in embedded systems.	10	L2	C04
	b.	Compare RISC and CISC architectures and GPP and ASIP processors	10	L2	C04
Module – 5					
Q.9	a.	Explain 1's and 2's complement methods with two examples each.	10	L2	C05
	b.	Convert: i) $(100101)_2$ - Decimal and Octal ii) $(782F)_{16}$ - Binary and Decimal. iii) $(59.2589)_{10}$ - Octal and Binary	10	L3	C05
OR					
Q.10	a.	Implement full adder circuit with its truth table and write the expressions for sum and carry.	10	L3	C05
	b.	Using basic Boolean theorems prove i) $(x + y)(x + z) = x + yz$ ii) $xy + xz + yz' = xz + yz'$	10	L3	C05

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