CBCS SCHEME

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1BECE105

First Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Fundamentals of Electronics and Communication Engineering

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.	Explain the operation of forward and reverse bias Characteristics of PN junction diode.	8	L2	CO1
	b.	With circuit diagram and waveforms, explain the operation of full wave rectifier circuit using center tap transformer.	8	L2	CO1
	c.	Find the forward and reverse resistances offered by a silicon diode for the given values I_F=100mA, V_R=50V. For silicon diode V_F =0.75V and I_R=100 nA.	4	L1	CO1
		OR			
Q.2	a.	Demonstrate the circuit diagram of three input AND and OR gate using diodes.	8	L2	CO1
	b.	With circuit diagram and waveforms, explain the operation of Half wave rectifier.	8	L2	CO1
	c.	Explain Zener diode as voltage regulator under no load condition.	4	L2	CO1
		Module – 2			
Q.3	a.	With neat diagram, Explain input and output characteristics of BJT in common emitter configuration.	8	L2	CO2
	b.	Explain the construction and operation of N-channel JFET.	8	L2	CO2
	c.	Explain BJT voltages and currents.	4	L2	CO2
		OR			
Q.4	a.	Explain the circuit operation and analysis of voltage divider bias method.	8	L2	CO2
	b.	Explain N-channel Enhancement type MOSFET and describe the construction and Operation.	8	L2	CO2
	c.	Show the circuit symbol of N-channel and P-channel JFET.	4	L1	CO2
		Module – 3			
Q.5	a.	Explain the ideal Op-Amp characteristics.	8	L2	CO3

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	b.	Explain Op-Amp as an inverting and non-inverting amplifier circuit.	8	L2	CO3
	c.	Briefly explain Op-Amp as a voltage follower.	4	L2	CO3
		OR			
Q.6	a.	Define the following with respect to Op-Amp. i) Input Bias current ii) CMRR iii) Slew Rate	8	L1	CO3
	b.	Explain Op-Amp differentiator and integrator circuit.	8	L2	CO3
	c.	Explain the Equivalent Circuit of Op-Amp.	4	L2	CO3
		Module – 4			
Q.7	a.	With a block diagram, explain the basic elements of communication system.	8	L2	CO4
	b.	What is Modulation? Define Amplitude and Frequency Modulation with neat waveforms.	8	L1	CO4
	c.	With a block diagram, explain AM Super heterodyne receiver.	4	L2	CO4
		OR			
Q.8	a.	What is a communication channel? Explain the characteristics of different communication channels.	12	L2	CO4
	b.	With a block diagram, explain FM super heterodyne receiver.	8	L2	CO4
		Module – 5			
Q.9	a.	Find the result the following i)$1101_{(2)} + 1010_{(2)}$ ii) $(110011)_2$ = ------$(?)_{10}$ iii) $(186)_{10}$ = ------$(?)_2$ iv) $(ABCD)_{16}$ = -----$(?)_2$	8	L1	CO5
	b.	State, Demonstrate and prove De Morgan's theorems for two variables.	8	L2	CO5
	c.	Explain the design a Half adder circuit using basic logic gates.	4	L2	CO5
		OR			
Q.10	a.	By using 1's complement performs the following subtraction i) $(1101)_2 - (1000)_2$ ii) $(1111)_2 - (1011)_2$	8	L2	CO5
	b.	Explain the design of Full adder circuit using basic logic gates.	8	L2	CO5
	c.	Simplify Y= (A+B)(A+$\bar{B}$)($\bar{A}$+B) by using laws and theorems of Boolean Algebra.	4	L2	CO5

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