

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2026

Fundamentals of Electronics & 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.*

Module – 1			M	L	C
Q.1	a.	With circuit diagram explain the operation of positive half wave rectifier. Draw the input and output waveforms.	8	L2	CO2
	b.	Explain Zener diode as voltage regulator under no load and full load conditions.	8	L2	CO1
	c.	Calculate the diode current, assuming that the diode has $V_F = 0.7 \text{ V}$ and diode dynamic resistance is 0.25Ω , supply voltage 1.5 V and series resistance has 10Ω .	4	L3	CO1
OR					
Q.2	a.	With circuit diagram explain the operation of full wave bridge rectifier. Draw the input and output waveforms.	8	L2	CO2
	b.	Explain diode logic circuit.	8	L2	CO2
	c.	Calculate current in the circuit when a germanium diode connected in series with a resistor of $2.2 \text{ K}\Omega$ is driven by a 10V DC supply.	4	L3	CO1
Module – 2					
Q.3	a.	Explain the construction and characteristics of N-channel JFET.	8	L2	CO2
	b.	Explain the working operation of NPN transistor.	8	L2	CO2
	c.	Calculate the I_C and I_E for a transistor that has $\alpha_{dc} = 0.98$ and $I_B = 100\text{mA}$. Find the value of β_{dc} for the transistor.	4	L2	CO2
OR					
Q.4	a.	Explain input and output characteristics of BJT in common base configuration.	8	L2	CO2
	b.	Explain N-channel enhancement type MOSFET and describe the construction and working.	8	L2	CO2
	c.	With neat circuit diagram, explain BJT as current amplifier.	4	L2	CO2
Module – 3					
Q.5	a.	Derive the expression for output voltage of an Op-Amp integrator circuit.	7	L2	CO2
	b.	Explain three types of open loop configurations of an op-amp.	7	L2	CO2
	c.	List the characteristics of an ideal op-amp.	6	L1	CO2

OR

Q.6	a.	With circuit diagram, derive the expression for output voltage of a 3 input inverting summing amplifier.	7	L2	CO2
	b.	Explain block diagram of typical Op-Amp.	7	L2	CO2
	c.	Define the following with respect to an op-amp : i) CMRR ii) Slew rate iii) Input offset voltage iv) Input offset current	6	L1	CO2

Module – 4

Q.7	a.	Explain Amplitude and Frequency modulation with neat waveforms.	10	L2	CO3
	b.	Explain Mobile wireless telephone systems.	10	L2	CO3

OR

Q.8	a.	With a block diagram explain the basic elements of a communication system.	10	L2	CO3
	b.	Explain different communication channels and their characteristics.	10	L2	CO3

Module – 5

Q.9	a.	Convert : i) $(10111)_2 = (?)_{10}$ ii) $(FACE.A2B)_{16} = (?)_{10}$ iii) $(68.28)_{10} = (?)_2$	6	L3	CO4
	b.	Simplify the following Boolean expression: $F = x'y'z + xyz + x'yz + xy'z$.	7	L3	CO4
	c.	Express the Boolean function $F = A + B'C$ as a sum of minterms.	7	L3	CO4

OR

Q.10	a.	Subtract using the 2's complement method. i) $(10111)_2 - (10011)_2$ ii) $(10001)_2 - (11010)_2$	6	L3	CO4
	b.	Draw a logic diagram for the Boolean function $F = x'y + xy'$.	7	L3	CO4
	c.	Construct and describe half adder with neat logic diagram and truth table.	7	L3	CO5
