

Model Question Paper

First/Second Semester B.E Degree Examination

Fundamentals of Electronics Engineering

Time: 3 Hours

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

Module -1			M	L	C
Q1	a.	Describe the operation of diode under forward and reverse bias condition. Draw V-I Characteristic of diode.	06	L2	CO1
	b.	Define rectifier. Explain the operation of full wave bridge rectifier with a neat circuit and waveform. Derive expression for RMS output voltage.	08	L2	CO1
	c.	A full wave rectifier uses a transformer with turns ratio 2:1. The load resistance is 330Ω. If the primary voltage is 230V, Calculate i) DC output voltage. ii) DC output current.	06	L3	CO2
OR					
Q2	a.	List the components of a DC power supply. With a neat block diagram, explain the design principles of DC power supply.	06	L2	CO1
	b.	Define zener diode. Discuss the operation of zener diode as i) Line regulator ii) Load regulator.	08	L2	CO1
	c.	In a half wave rectifier, the input voltage is 120V. The diode forward resistance is 30Ω and load resistance $R_L = 1.2k\Omega$. Calculate i) DC output voltage. ii) DC Output Current.	06	L3	CO2
Module- 2					
Q3	a.	Discuss the operation of BJT as current and voltage amplifier.	06	L2	CO1
	b.	Define DC load line. Describe how DC load line can be plotted for a transistor.	08	L2	CO1
	c.	A transistor used in an amplifier circuit has the following parameters: $\alpha_{dc} = 0.975$, Base Current $I_B = 100\mu A$. Determine the value of β_{dc} , I_C , I_E .	06	L3	CO2
OR					
Q4	a.	Define an amplifier. Describe various types of amplifiers.	06	L2	CO1
	b.	What is biasing? Discuss the principles of base biasing with circuit and relevant equations.	08	L2	CO1
	c.	A transistor used in a switch circuit has the following parameters: $I_C = 2mA$, $I_B = 50\mu A$. Determine β_{dc} , α_{dc} and I_E .	06	L3	CO2
Module - 3					
Q5	a.	Describe the block diagram of op-amp. List the ideal characteristics of op-amp.	06	L2	CO1
	b.	With a neat circuit, explain the operation of inverting amplifier. Derive expression for voltage gain.	08	L2	CO1
	c.	Design an adder circuit to get following output. $V_{out} = -[0.4V_1 + 0.6V_2 + 0.8V_3]$	06	L3	CO2
OR					

Q6	a.	Explain the significance of following op-amp parameters. i) Offset current ii) CMRR iii) Input impedance	06	L2	CO1
	b.	With a neat circuit and relevant waveforms explain astable multivibrator using 555 IC	08	L2	CO1
	c.	A non-inverting amplifier has a voltage gain of 60. If resistor $R_1=3.3k\Omega$, Find resistor R_f . Also find output voltage if input $V_{in}=50mV$.	06	L3	CO2
Module - 4					
Q7	a.	Perform the following number conversion. i) $(A87)_{16}$ to Decimal ii) $(98)_{10}$ to Binary	06	L3	CO2
	b.	What is an adder? Describe the operation of full adder. Implement the same using basic gates.	08	L3	CO2
	c.	Define flip-flop. Explain the functions of Reset Set (RS) flip-flop with logic diagram and truth table.	06	L2	CO1
OR					
Q8	a.	Perform the following binary subtraction. i) $(111101-101111)$ using 1's complement. ii) $(110011-101011)$ using 2's complement.	06	L3	CO2
	b.	What is a multiplexer? Describe the functions of 4:1 Multiplexer. Implement 4:1 Mux using logic gates.	08	L3	CO2
	c.	What is a universal gate? Show how basic gates can be implemented using universal gates.	06	L2	CO1
Module - 5					
Q9	a.	Briefly explain the history of wireless communication.	06	L2	CO3
	b.	Draw the functional block diagram of mobile handset and describe the operation.	08	L2	CO3
	c.	What is an embedded system? Differentiate between general purpose and embedded computing system.	06	L2	CO3
OR					
Q10	a.	Discuss the operation of barcode scanner and decoder with a neat block diagram.	06	L2	CO3
	b.	Draw the block diagram of digital camera system and explain the functions.	08	L2	CO3
	c.	Describe the elements of an embedded system.	06	L2	CO3
