PVP 23

Code: 23EC5401

II B.Tech - II Semester – MINOR Examinations – APRIL 2026

ELECTRONIC DEVICES AND BASIC CIRCUITS

(MINOR in ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.
4. All parts of Question paper must be answered in one place.

BL – Blooms Level CO – Course Outcome

PART – A

		BL	CO
1.a)	Write down and explain junction diode equation.	L2	CO1
1.b)	Write the applications of varactor diode.	L1	CO1
1.c)	What is a clamping circuit? Mention any applications.	L1	CO1
1.d)	What is a rectifier and list its types?	L1	CO2
1.e)	Mention different modes of operation of BJT.	L1	CO3
1.f)	Why transistor is called a current controlled device.	L2	CO3
1.g)	What is an operational amplifier?	L1	CO3
1.h)	Explain the importance of an oscillator.	L2	CO3
1.i)	Mention the advantages of FET over BJT.	L2	CO4
1.j)	What is a MOSFET? Mention its types.	L1	CO4

PART – B

			BL	CO	Max. Marks
		UNIT-I			
2	a)	What is the effect of forward and reverse biasing of p-n junction on the depletion region? Explain with necessary diagrams.	L2	CO1	5 M
	b)	Explain the energy band diagram of an open circuited p-n junction diode.	L2	CO1	5 M
		OR			
3	a)	Explain V-I characteristics of a Zener diode. Describe how a Zener diode acts as a voltage regulator.	L2	CO1	5 M
	b)	The current in the reverse biased PN diode made of Ge is 0.2μA. When the applied voltage is 0.1V. Find out the current at room temperature.	L2	CO1	5 M
		UNIT-II			
4	a)	What is clamper and explain the types of clampers and relevant wave forms.	L2	CO1	5 M
	b)	Write the importance of filter in a rectifier and derive the equation for ripple factor for a rectifier with C-filter.	L3	CO2	5 M
		OR			
5	a)	Explain half wave rectifier and derive its ripple factor expression.	L2	CO2	5 M

	b)	An AC supply of 230 V is applied to a half-wave rectifier circuit through transformer of turns ration 5:1. Assume the diode is an ideal one. The load resistance is 300 Ω. Find: i. DC output voltage ii. PIV iii. Maximum and average values of power delivered to the load.	L3	CO2	5 M
UNIT-III					
6	a)	Explain the working of NPN and PNP transistor.	L2	CO3	5 M
	b)	Compare and contrast the typical characteristics of CE, CB and CC configuration.	L3	CO3	5 M
OR					
7		With the help of neat diagram explain the operation, input and output characteristics of a transistor in CE configuration.	L3	CO3	10 M
UNIT-IV					
8	a)	Describe the block diagram of op-amp.	L2	CO3	5 M
	b)	What is meant by Ideal op-amp and discuss about inverting, non inverting configurations with neat sketches.	L2	CO3	5 M
OR					
9	a)	With a neat circuit diagram, explain the RC-Phase Shift Oscillator and derive its frequency of oscillation.	L2	CO3	5 M

	b)	Construct the functional pin diagram of IC 555 Timer & Explain.	L2	CO3	5 M
UNIT-V					
10	a)	What is JFET? Explain the operation of JFET.	L2	CO4	5 M
	b)	With neat sketches, explain the drain and transfer characteristics of JFET.	L2	CO4	5 M
OR					
11	Describe the construction and working principle of Enhancement mode and depletion mode MOSFET and draw its characteristics.		L2	CO4	10 M