



B.Tech II Semester Supplementary Examinations, January 2024

ELECTRONIC DEVICES & CIRCUITS
(Common to ECE & IT)

Maximum Marks: 60

Date: 31.01.2024 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x1M=10 Marks)			CO	Bloom Tx
1.	a	Define static and dynamic resistance of PN diode.	CO1	L1
	b	Define junction capacitance in varactor diode.	CO1	L1
	c	What is meant by filter?	CO2	L1
	d	Write the disadvantages of semiconductor-controlled rectifier.	CO2	L1
	e	Why Transistor is called Current Controlled Device?	CO3	L1
	f	What is "Thermal runaway" in transistors and mention how it can be avoided?	CO3	L1
	g	What is meant by stabilization?	CO4	L1
	h	Define transistor biasing.	CO4	L1
	i	Define parameters of JFET.	CO5	L1
	j	What are the two modes of MOSFET?	CO5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)				
2	A. Derive an expression for diode current equation. [5M] B. Find the value of D.C. resistance and A.C resistance of a Germanium junction diode at 25°C with reverse saturation current, $I_0 = 25\mu A$ and at an applied voltage of 0.2V across the diode. [5M]		CO1	L3
	OR			
3	A. What do you understand by depletion region at p-n junction? What is the effect of forward and reverse biasing of p-n junction on the depletion region? Explain with necessary diagrams. [7M] B. Compare ideal and practical diodes. [3M]		CO1	L4
4	Derive the expression for efficiency and ripple factor of Full wave-rectifier. [10M]		CO2	L3
	OR			

5	<p>A. A full wave rectifier is operated from 50 Hz supply with 120 V (rms). It is connected to a load drawing 50mA current and using 100μF filter capacitor. Calculate the DC output voltage and rms value of ripple voltage. Also calculate the ripple factor. [5M]</p> <p>B. Draw the circuit diagram of half wave type rectifier and explain its operation. [5M]</p>	CO2	L4
6	<p>A. Develop the input and output characteristics of a transistor in CE configuration. [7M]</p> <p>B. Formulate the relationship among α, β, γ. [3M]</p>	CO3	L4
	OR		
7	Analyze the working mechanism of CB configuration of BJT. [10M]	CO3	L4
8	<p>A. A Silicon transistor uses voltage divider bias method with $\beta = 100$, $V_{CC} = 12$ V, $R_C = 4K\Omega$, $R_1 = 10K\Omega$ and $R_2 = 100K\Omega$ and $R_E = 3K\Omega$, $V_{BE} = 0.6$ V. Determine the operating point and stability factor. [7M]</p> <p>B. What do you understand by DC and AC load lines? [3M]</p>	CO4	L4
	OR		
9	Explain the basic requirements of transistor biasing. Verify these requirements in collector to base bias circuit. [10M]	CO4	L4
10	<p>A. Compare BJT & FET. [5M]</p> <p>B. Explain the operation of JFET. [5M]</p>	CO5	L3
	OR		
11	Explain the construction and principle of operation of Depletion type N-Channel MOSFET. [10M]	CO5	L2