Q.P. Code: 19EC0402 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations July-2022

ELECTRONIC DEVICES AND CIRCUITS

(Common to EEE & ECE)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	**a**	Analyze the current components in a PN diode and develop the expression for diode current equation.	**L6**	**8M**
	b	When a reverse bias is applied to a germanium PN junction diode, the reverse saturation current at room temperature is 0.3μA. Determine the current flowing in the diode when 0.15V forward bias is applied at room temperature.	**L5**	**4M**

OR

2	**a**	Draw and explain the V-I characteristics of Zener diode.	**L2**	**6M**
	b	Explain Positive and Negative Diode Clippers with neat waveforms.	**L2**	**6M**

UNIT-II

3	**a**	With neat circuit diagram and waveforms, illustrate the construction and working of Bridge rectifier.	**L2**	**5M**
	b	Draw the circuit diagram of Full wave rectifier with inductor filter and illustrate its operation. Also derive the expression for ripple factor.	**L1**	**7M**

OR

4	**a**	Explain the working principle of CLC or π section filter and also derive the expression for ripple factor.	**L2**	**6M**
	b	Demonstrate the working and characteristics of UJT with neat diagram.	**L2**	**6M**

UNIT-III

5	**a**	Explain the operation of NPN transistor with neat diagram.	**L2**	**6M**
	b	Illustrate the Input and Output characteristics of BJT in CC Configuration. Also Obtain the expression for Output collector current equation for a Transistor in CC configuration.	**L2**	**6M**

OR

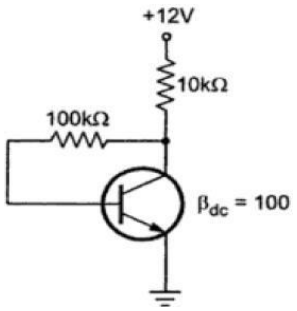
6		Interpret the operation and characteristics of n-channel depletion type MOSFET with diagram.	**L2**	**12M**

UNIT-IV

7	**a**	Explain the concept of DC and AC Load lines and discuss the criteria for fixing the Q-point.	**L2**	**7M**
	b	List the different types of Biasing a Transistor and explain the fixed bias of a Transistor.	**L4**	**5M**

OR

8	**a**	Explain Thermal Runaway and Thermal Resistance.	**L2**	**6M**
	b	Solve for the Q-point values for the circuit shown in the Fig.	**L5**	**6M**



UNIT-V

9	**a**	Determine the parameters Ai, R_i, A_v and R_0 of Common Collector Amplifier using simplified hybrid model analysis.	**L5**	**6M**
	b	A voltage source of internal resistance, R_s= 900Ω drives a CC amplifier using load resistance R_L=2000Ω. The CE h parameters are h_{fe}=60, h_{ie}=1200Ω, h_{oe} = 25μA/V and $h_{re} = 2 \times 10^{-4}$. Solve A_I, R_i, A_v and R_0 using approximate analysis.	**L3**	**6M**

OR

10		A CE amplifier is driven by a voltage source of internal resistance R_s 800Ω and the load impedance of R_L=1000Ω. The h-parameters are h_{ie}=1k, h_{fe}=50, h_{oe} = 25μA/V and $h_{re} = 2 \times 10^{-4}$. Find current gain, voltage gain, input impedance and output impedance using exact analysis and approximate analysis.	**L1**	**12M**

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