Q.P. Code: 18EC0401 **R18**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations November-2020

ELECTRONIC DEVICES

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	a	What is Drift current and Diffusion current in a Diode?	2M
	b	Define the Ripple factor and efficiency of Full wave rectifier.	2M
	c	What is thermal runaway? How it can be avoided?	2M
	d	Draw the circuit diagram for single stage RC coupled amplifier-using BJT.	2M
	e	What is MOSFET? Classify the types of MOSFET.	2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Draw the circuit to plot the V-I characteristics of PN junction diode and explain in detail.	5M
	b	Write the diode current equation and explain each term in a Diode current equation.	5M
		OR	
3		Mention the importance of Diode Clipper. Discuss the Positive and Negative Diode Clippers with the help of input and output waveforms.	10M

UNIT-II

4	a	Explain the circuit diagram of a Bridge rectifier and sketch the input and output waveforms.	5M
	b	Design a filter for FWR circuit with LC filter to provide an output voltage of 10 Volts with a load current of 200 mA and the ripple is limited to 2%.	5M
		OR	
5	a	Explain the principle of operation and characteristics of Tunnel diode	5M
	b	Draw and explain the basic structure of LED. Mention the applications of LED.	5M

UNIT-III

6	a	Discuss the operation of NPN transistor with diagram	5M
	b	A transistor with $\alpha = 0.97$ has a reverse saturation current of 1 uA in CB configuration.Calculate the value of leakage current in the CE configuration. Also find the collector current and the emitter current if the value of base current is 20 uA	5M
		OR	
7	a	Describe how self-bias circuit will eliminate drawbacks in fixed bias circuit in BJT.	5M
	b	Derive an expression for stability factor S in self bias circuit.	5M

UNIT-IV

8	a	Why hybrid model is used for the analysis of BJT amplifier at low frequencies?	4M
	b	Draw the small signal equivalent circuit for CE transistor amplifier and deduce the expressions for current gain, input impedance, output impedance and voltage gain with and without voltage source.	6M

OR

9 a Find expressions for voltage gain, current gain, Input impedance and output impedances of CC amplifier using simplified hybrid model. **5M**

b A_I, R_i, A_v and R_0A voltage source of internal resistance R s = 900Ω drives a CC amplifier using load resistanceR L =2000Ω. The CE h parameters are h_{fe} =60, h_{ie}=1200Ω, h_{oe} = 25μA/V and h_{re} = 2 x 10^{-4} .Compute A_I, R_i, A_v and R_0 using approximate analysis. **5M**

UNIT-V

10 a With the help of neat diagram, explain the operation and characteristics of n-channel enhancement type MOSFET. **5M**

b Define μ, r_d and g_m of a FET and derive the relation between them. **5M**

OR

11 Discuss CMOS fabrication process with neat diagram. **10M**

END