Duration: 3 Hours **Marks: 80**

Instructions:

(1) Question 1 is compulsory, solve any three from remaining questions
(2) Assume suitable data if necessary.
(3) Diagrams to be drawn neatly.

Solve any **TWO** of the following--

Q1(A)	Draw and explain energy band diagrams of P-N junction under forward bias, reverse bias conditions.	10
Q1(B)	Explain construction, working and characteristics of JFET	10
Q1(C)	Explain construction, working and characteristics of SCR	10
Q2(A)	Derive the expression of built in potential Vbi for a P-N junction under zero bias and hence calculate Vbi at T = 300 K for Nd =10^{15}cm^{-3} and Na =10^{15}cm^{-3}.	10
Q2(B)	Explain any two applications of JFET.	10
Q3(A)	Explain construction, working and characteristics of Enhancement MOSFET.	10
Q3(B)	Draw and explain Capacitance-voltage characteristics of MOS capacitor.	10
Q4(A)	Explain construction, working, characteristics of (i)Photodiode (ii)Avalanche photodiode.	10
Q4(B)	Explain construction and characteristics of Triac.	10

Q5(A)	List Nonideal effects in BJT.Explain in detail any one of them.	10
Q5(B)	Draw and explain any two models of BJT.	10
	Solve any **TWO** of the following.	
Q6(A)	Gunn diode.	10
Q6(B)	Breakdown mechanisms in zener diode.	10
Q6(C)	Two terminal MOS structre.	10
