(3 Hours) **[Total Marks:80]**

N.B. **(1)** Question no.1 is compulsory.
(2) Attempt any three from the rest.
(3) Make any suitable assumption wherever required.

Q.1 Answer any four.

	(a)	Explain drift current and diffusion current	5M
	(b)	Explain DC load line in common emitter BJT	5M
	(c)	Explain why FET is free from thermal runaway.	5M
	(d)	Explain the re model of BJT.	5M
	(e)	Explain the sufficient and necessary conditions for the oscillation.	5M
Q.2	**(a)**	Explain the input and output characteristics of CE BJT amplifier.	10M
	(b)	Explain different biasing techniques in BJT	10M
Q.3	**(a)**	Write the working principle of enhancement and depletion type of MOSFET.	10M
	(b)	Draw the circuit diagram of bridge rectifier with LC filter with all the waveforms and derive the expression for ripple factor.	10M
Q.4	**(a)**	Draw the circuit diagram of current series feedback amplifier and derive the expression for input and output impedance and voltage gain with feedback.	10M
	(b)	Explain the working principle of the following semiconductor devices i. PIN diode ii. FET iii. L-C tank circuit iv. Schottky diode	10M
Q.5	**(a)**	Draw the circuit diagram of collpitt's oscillator and explain the working. Derive the expression for the frequency of oscillation.	10M
	(b)	explain the modeling of CE BJT in h- parameter and hence derive the expression for voltage gain	10M
Q.6		Write short note on any THREE of the following.	20M
	(a)	UJT relaxation oscillator.	
	(b)	Zener diode as voltage regulator	
	(c)	Two port network	
	(d)	Input output and transfer characteristics of FET	
