Time: 3 Hours **Max. Marks: 80 Marks**

N. B. 1. Question No. 1 is compulsory.
2. Attempt any three from Question two to Six.
3. All Questions carry equal marks.

Q.1	**Solve any Four out of Five**	
(a)	State & explain the Shockley's current equation of the P-N junction diode.	**05**
(b)	With a neat sketch explain the unbiased positive clamper circuit operation.	**05**
(c)	Explain the working principle & operation of solar cell with a neat sketch.	**05**
(d)	Sketch & explain with appropriate waveforms the capacitor (C) filter.	**05**
(e)	Draw the circuit diagram & explain the operation of full wave bridge rectifier.	**05**
Q.2 (a)	With neat sketch, describe structure, construction, operation & V-I characteristics of the Schottky diode.	**10**
Q.2 (b)	For (any) full wave rectifier, define 'ripple factor' & derive expression for ripple factor (γ).	**10**
Q.3 (a)	With neat sketch, describe the operation of bridge type full-wave rectifier with appropriate waveforms.	**10**
Q.3 (b)	Explain the V-I characteristics of a photo diode with a neat sketch. What is meant by 'dark current' ?	**10**
Q.4 (a)	Discuss working of Zener diode as voltage regulator for changing input supply voltage & changing load resistance.	**10**
Q.4 (b)	For (any) full wave rectifier, define 'ripple factor' & derive expression for ripple factor (γ).	**10**
Q.5 (a)	Systematically compare all filter circuits (C, L, L-C & C-L-C) on any five points.	**10**
Q.5 (b)	For a light emitting diode, sketch & explain constructional details & discuss the operation.	**10**
Q.6 (a)	With neat sketch, explain the operation of n-channel enhancement MOSFET.	**10**
Q.6 (b)	Explain input & output characteristics of BJT in common emitter (CE) configuration.	**10**