SE Sem III (DSE) "R-2019 C Scheme" "ECS", Jan 2023

27/1/2023

Time: 3 Hours

Max. Marks: 80 Marks

Solve any Four out of Five **(05 Marks Each)**

State & explain the Shockley's current equation of the P-N junction diode.

For the circuit shown below in Fig. 1 draw output waveform if an input signal of 20 V peak-to-peak is applied.

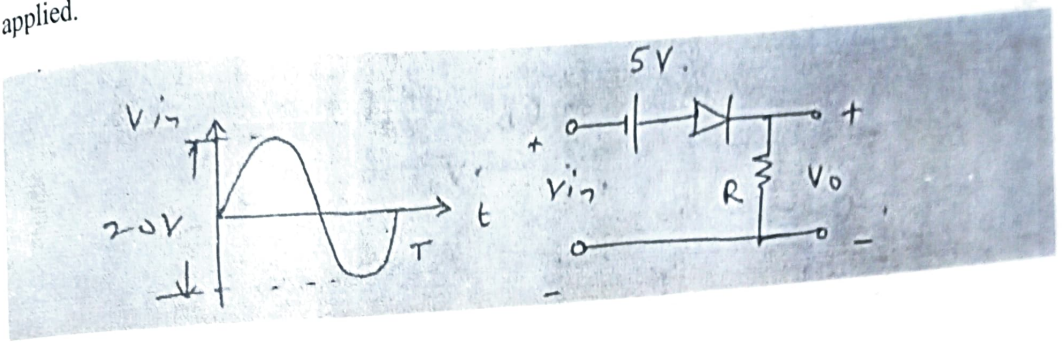

Fig. 1 for Q.2 (B)

Explain the working principle & operation of solar cell with a neat sketch.

Sketch & explain with appropriate waveforms the capacitor (C) filter.

Draw the circuit diagram & explain the operation of full wave bridge rectifier.

2 (a) With neat sketch, describe structure, construction, operation & V-I characteristics of the Schottky diode. **10**

2 (b) For (any) full wave rectifier, define 'ripple factor' & derive expression for ripple factor (γ). **10**

3 (a) With neat sketch, describe the operation of center-tapped full-wave rectifier with appropriate waveforms. **10**

3 (b) Explain the V-I characteristics of a photo diode with a neat sketch. What is meant by 'dark current'? **10**

4 (a) Discuss the working of Zener diode as voltage regulator for changing input supply voltage & changing load resistance. **10**

4 (b) For (any) full wave rectifier, define 'ripple factor' & derive expression for ripple factor (γ). **10**

5 (a) Systematically compare all filter circuits (C, L, L-C & C-L-C) on any five points. **10**

5 (b) For a light emitting diode, sketch & explain constructional details & discuss the operation. **10**

6 (a) With neat sketch, explain the operation of n-channel enhancement MOSFET. **10**

6 (b) Explain input & output characteristics of BJT in common emitter (CE) configuration. **10**

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