

SAMPLE QUESTIONS 2

1. What is considered as the key electrical conductivity?
 - i. The number of electrons in the valence orbit
 - ii. The number of protons in the nucleus
 - iii. The number of neutrons in the nucleus
 - iv. The number of protons plus the number of electrons in the atom
2. The peak inverse voltage of a half wave rectifier circuit is approximately equal to the _____ of the input signal.
 - i. Peak amplitude
 - ii. Frequency
 - iii. Voltage sinusoidal
 - iv. Current
3. An acceptor atom is also called
 - i. Pentavalent atom
 - ii. Trivalent atom
 - iii. Minority carrier
 - iv. Majority carrier
4. When temperature increases, barrier potential _____
 - i. Remains the same
 - ii. Decreases
 - iii. Increases
 - iv. Either increases or decreases depending on the semiconductor material used
5. Avalanche effects occurs at
 - i. Higher reverse voltages
 - ii. Lower reverse voltages
 - iii. Higher forward voltages
 - iv. Lower forward voltages
6. What temperature is inside the diode, right at the junction of the p and n-type materials?
 - i. Junction temperature
 - ii. Ambient temperature
 - iii. Internal temperature
 - iv. Absolute temperature
7. A diode is a nonlinear device because
 - i. It produces a nonlinear graph
 - ii. Its current is not directly proportional to its voltage
 - iii. It has a built-in barrier potential
 - iv. It can rectify alternating current
8. A silicon crystal is a/an _____ of a semiconductor if every atom in the crystal is a silicon atom.
 - i. Extrinsic
 - ii. Intrinsic

- iii. P-type
 - iv. N-type
9. The average dc voltage of a half wave rectifier circuit is _____ of the value of the peak input voltage.
- i. 63.6%
 - ii. 31.8%
 - iii. 4.8%
 - iv. 6.2%
10. A heavily doped semiconductor has
- i. High resistance
 - ii. No effect on the semiconductor characteristics
 - iii. More heat dissipation
 - iv. Low resistance
11. Avalanche breakdown in a semiconductor takes place
- i. When forward current exceeds a certain value
 - ii. When potential barrier is reduced to zero
 - iii. When reverse bias exceeds a certain value
 - iv. When forward bias exceeds a certain value

THEORY

1. An a.c. supply of 230V is applied to a half-wave rectifier circuit through transformer of turns ratio 5:1. Assume the diode is an ideal one. The load resistance is 300Ω .
Find
 - (a) Dc output voltage
 - (b) PIV
 - (c) Maximum and average values of power delivered to the load.
2. A Full-wave rectifier circuit uses two silicon diodes with a forward resistance of 20Ω each. A dc voltmeter connected across the load of $1k\Omega$ reads 55.4volts. Calculate
 - (a) I_{rms}
 - (b) Average voltage across each diode,
 - (c) Ripple factor, and
 - (d) Transformer secondary voltage rating.
3. In a bridge rectifier the transformer is connected to 220V, 60Hz mains and the turns ratio of the step down transformer is 11:1. Assuming the diode to be ideal, find:
 - (a) I_{dc}
 - (b) Voltage across the load
 - (c) PIV assume load resistance to be $1k\Omega$

4. A 230V, 60Hz voltage is applied to the primary of a 5:1 step down, center tapped transformer used in the Full-wave rectifier having a load of 900Ω . If the diode resistance and the secondary coil resistance together has a resistance of 100Ω .

Determine:

- (a) Dc voltage across the load
- (b) Dc current flowing through the load
- (c) Dc power delivered to the load
- (d) Ripple voltage.