Q.2 Explain the following:

a. Superconductivity
b. Thermoelectric effect

Answer: **(a) Section 3.8 Page 112 of Text Book-I**
(b) Section 3.14 Page 128 of Text Book-I

Q.3 a. Explain effect of dielectric on the behaviour of a capacitor.

Answer: **Section 4.2 Page 135 of Text Book-I**

b. What is polarizability? How it is affected by internal fields developed in solids?

Answer: **Section 4.6 Page 145 of Text Book-I**

Q.4 a. What is dielectric loss? Write significance of loss tangent.

Answer: **Section 5.5 & 5.6 Pages 161 & 163 of Text Book-I**

b. What is piezoelectricity? Explain it with example.

Answer: **Section 5.13 Page 190 of Text Book-I**

Q.5 a. Discuss the following:-
(i) Magnetostriction
(ii) Factors affecting permeability

Answer: **(i) Section 6.11 Page 214 of Text Book-I**
(ii) Section 6.12 Page 215 of Text Book-I

b. Explain magnetic resonance.

Answer: **Section 6.16 Page 223 of Text Book-I**

Q.6 a. What is Diffusion in semiconductors? How it is related with Einstein equation

Answer: **Section 7.8 & 7.9 Page 253-254 of Text Book-I**

b. Discuss the following:-
(i) Thermal conductivity of semiconductors

(ii) Electrical Conductivity of doped materials

Answer: **(i) Section 7.11 Page 258 of Text Book-I**
(ii) Section 7.12 Page 259 of Text Book-I

Q.7 a. Discuss Zener & Avalanche breakdown in semiconductors.

Answer: **Section 8.4 Page 283 of Text Book-I**

b. What is SCR? Explain its two transistor model & draw its V-I characteristics.

Answer: **Section 8.9/8.9.1 Page 297 of Text Book-I**

Q.8 Discuss construction features & write applications of the following:

(a) Wire – wound resistor
(b) Variable capacitors
(c) Inductors
(d) Reed Relay

Answer: **(a) Section 12.2(vii) Page 354 of Text Book-I**
(b) Section 12.3(xi) Page 365 of Text Book-I
(c) Section 12.4(i) Page 367 of Text Book-I
(d) Section 12.5(xvii) Page 372 of Text Book-I

Q.9 Explain the following:

(a) Alloyed junction process
(b) Operation of JFET with high drain voltage

Answer: **(a) Section 14.3 Page 392 of Text Book-I**
(b) Section 14.9.3 Page 405 of Text Book-I

TEXT BOOK

I. Introduction to Electrical Engineering Materials by C.S. Indulkar and S. Thiruvengadam, 6th Edition, Reprint 2012 Edition, S. Chand and Company, New Delhi.