Section A

● **Write the answer of the following questions. [Each carries 1 Mark]** **[10]**

1. Suppose a pure Si crystal has 5×10^{28} atoms m^{-3}. It is doped by 1 ppm concentration of pentavalent As. Calculate the number of electrons and holes. Given that, $n_i = 1.5 \times 10^{16}$ m^{-3}

2. Differentiate between P-type and N-type semiconductor (any four).

3. The number of silicon atoms per m^3 is 5×10^{28}. This is doped simultaneously with 5×10^{22} atoms per m^3 of Arsenic and 5×10^{20} per m^3 of atoms of Indium. Calculate the number of electrons and holes. Given that $n_i = 1.5 \times 10^{16}$ m^{-3}. Is the material n-type or p-type ?

4. Explain half wave rectifier with necessary circuit diagram. Draw the graphs of input and output voltage versus time.

5. Draw the circuit diagram of a full-wave rectifier. Explain full-wave rectification in brief. Also draw input-output waveforms.

6. Write briefly on n-type semiconductor.

7. When is the p-n junction called reverse bias and explain the change in p-n junction from this type of connection.

8. Write briefly on p-type semiconductor.

9. When and why the p-n junction is called a forward bias ? and describe the changes at such bias.

10. Give a chemical classification of semiconductors and write examples of each.

Section [A] : 1 Marks Questions				
No	Ans	Chap	Sec	Que	Universal_QueId
1.	-	Chap 14	S8	1	QP23P11B1211_P2C14S8Q1
2.	-	Chap 14	S8	3	QP23P11B1211_P2C14S8Q3
3.	-	Chap 14	S8	5	QP23P11B1211_P2C14S8Q5
4.	-	Chap 14	S8	6	QP23P11B1211_P2C14S8Q6
5.	-	Chap 14	S8	7	QP23P11B1211_P2C14S8Q7
6.	-	Chap 14	S9	17	QP23P11B1211_P2C14S9Q17
7.	-	Chap 14	S9	20	QP23P11B1211_P2C14S9Q20
8.	-	Chap 14	S10	17	QP23P11B1211_P2C14S10Q17
9.	-	Chap 14	S10	20	QP23P11B1211_P2C14S10Q20
10.	-	Chap 14	S10	12	QP23P11B1211_P2C14S10Q12

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➠ $n_h = 4.5 \times 10^{-9}$ m^{-3}

2. Differentiate between P-type and N-type semiconductor (any four).

➠ Try Yourself

3. The number of silicon atoms per m^3 is 5×10^{28}. This is doped simultaneously with 5×10^{22} atoms per m^3 of Arsenic and 5×10^{20} per m^3 of atoms of Indium. Calculate the number of electrons and holes. Given that $n_i = 1.5 \times 10^{16}$ m^{-3}. Is the material n-type or p-type ?

➠ $n_h = 4.5 \times 10^9$ m^{-3}, $n_e = 4.95 \times 10^{22}$ m^{-3}

4. Explain half wave rectifier with necessary circuit diagram. Draw the graphs of input and output voltage versus time.

➠ Try Yourself

5. Draw the circuit diagram of a full-wave rectifier. Explain full-wave rectification in brief. Also draw input-output waveforms.

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6. Write briefly on *n*-type semiconductor.

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