

NEET SEMICONDUCTOR ELECTRONICS — INTRINSIC AND EXTRINSIC
SEMICONDUCTORS — PYQS

Max. Marks: 28

Questions: 7

Section A (MCQ) — 7 questions

Q.1 The electron concentration in an n-type semiconductor is the same as hole concentration in a p-type semiconductor. An external field (electric) is applied across each of them. Compare the currents in them. [NEET (UG) 2021]

- (1) No current will flow in p-type, current will only flow in n-type
- (2) Current in n-type = current in p-type
- (3) current in p-type > current in n-type
- (4) current in n-type > current in p-type

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full solution

Q.2 For a p-type semiconductor, which of the following statements is **true**? [NEET (UG) 2019]

- (1) Holes are the majority carriers and trivalent atoms are the dopants.
- (2) Holes are the majority carriers and pentavalent atoms are the dopants.
- (3) Electrons are the majority carriers and pentavalent atoms are the dopants.
- (4) Electrons are the majority carriers and trivalent atoms are the dopants.

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Q.3 In a n-type semiconductor, which of the following statements is true? [NEET 2013]

- (1) Holes are minority carriers and pentavalent atoms are dopants.
- (2) Holes are majority carriers and trivalent atoms are dopants.
- (3) Electrons are majority carriers and trivalent atoms are dopants.
- (4) Electrons are minority carriers and pentavalent atoms are dopants.

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Q.4 Pure Si at 500 K has equal number of electron (n_e) and hole (n_h) concentrations of $1.5 \times 10^{16} \text{ m}^{-3}$. Doping by indium increases n_h to $4.5 \times 10^{22} \text{ m}^{-3}$. The doped semiconductor is of

[AIPMT 2011 (Mains)]

- (1) p-type having electron concentration $n_e = 5 \times 10^9 \text{ m}^{-3}$
- (2) n-type with electron concentration $n_e = 5 \times 10^{22} \text{ m}^{-3}$
- (3) p-type with electron concentration $n_e = 2.5 \times 10^{10} \text{ m}^{-3}$
- (4) n-type with electron concentration $n_e = 2.5 \times 10^{23} \text{ m}^{-3}$

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Q.5 If a small amount of antimony is added to germanium crystal [AIPMT 2011 (Prelims)]

- (1) it becomes a p-type semiconductor
- (2) the antimony becomes an acceptor atom
- (3) there will be more free electrons than holes in the semiconductor
- (4) its resistance is increased

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Q.6 Which one of the following statements is false?

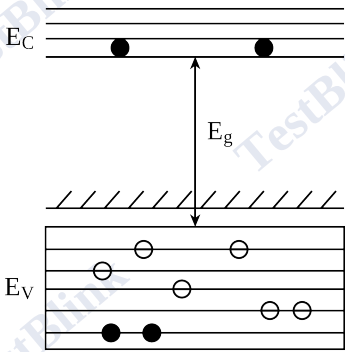
[AIPMT 2010 (Prelims)]

- (1) Pure Si doped with trivalent impurities gives a p-type semiconductor.
- (2) Majority carriers in a n-type semiconductor are holes.
- (3) Minority carriers in a p-type semiconductor are electrons.
- (4) The resistance of intrinsic semiconductor decreases with increase of temperature.

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Q.7 In the energy band diagram of a material shown below, the open circles and filled circles denote holes and electrons respectively. The material is

[AIPMT 2007]



- (1) an insulator
- (2) a metal
- (3) an n-type semiconductor
- (4) a p-type semiconductor

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ANSWER KEY

Ques.	1	2	3	4	5	6	7				
Ans.	4	1	1	1	3	2	4				