

✓ In a band structure of a substance, the highest occupied energy level in valence band is called as ----- and its energy is ----- \* 2/2

- ☐ Fermi level; Band energy
- ☐ Lower level; Fermi energy
- ☒ Fermi level; Fermi energy
- ☐ None of the above



✓ When a solid contains 18 atomic orbitals, predict the number of molecular orbitals along with presence of bonding and antibonding molecular orbitals \* 2/2

- ☐ 8 molecular orbitals; 4 bonding and 4 antibonding molecular orbitals
- ☐ 18 molecular orbitals; 8 bonding, 1 non-bonding and 9 antibonding molecular orbitals
- ☒ 18 molecular orbitals; 9 bonding and 9 antibonding molecular orbitals
- ☐ 9 molecular orbitals; 4 bonding, 1 non-bonding and 4 antibonding molecular orbitals



✓ With respect to band theory of substances, the difference in their electrical conductivity is predicted by ----- \* 2/2

- ☐ their band structure



- ☐ if valence band is partly or completely filled with electrons
- ☐ the difference in band gap energy among the substances
- ☒ All of the above



✗ Metals exhibit high electrical conductivity due to ----- \*

.../2

- ☒ presence of zero band gap energy
- ☐ absence of free electrons
- ☐ lowered valence band energy
- ☐ increase in conduction band energy



No correct answers

✓ The valence band of the sodium is constituted by the ----- atomic orbitals of sodium \*

2/2

- ☐ 3d
- ☐ 3p
- ☒ 3s
- ☐ 2s



✓ The electrical conductivity of Magnesium is due to the ----- \*

2/2

- ☐ overlapping of 2s and 2p orbitals
- ☐ discontinuity of 2s and 2p orbitals



- ☐ discontinuity of 3s and 3p orbitals
- ☒ overlapping of 3s and 3p orbitals



✗ Give the nature of Carbon atom in the diamond crystal structure \* .../2

- ☒ sp<sup>3</sup> hybridized orbitals
- ☐ sp<sup>2</sup> hybridized orbitals
- ☐ sp<sup>d</sup>2 hybridized orbitals
- ☐ None of the above



No correct answers

✓ The trend in electrical conductivity of sodium, magnesium and aluminium shows ----- \* 2/2

- ☐ decrease in electrical conductivity
- ☒ increase in electrical conductivity
- ☐ same electrical conductivity
- ☐ equal electrical conductivity



✗ How many bonding and antibonding orbitals are available in diamond \* .../2

- ☒ 2 bonding and 2 antibonding orbitals
- ☐ 1 bonding and 1 antibonding orbitals



☐ 3 bonding and 3 antibonding orbitals

☐ 4 bonding and 4 antibonding orbitals

No correct answers

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