

EASTERN UNIVERSITY, SRILANKA
FIRST EXAMINATION IN SCIENCE (FIRST SEMESTER) -2002/2003
REPEAT
CH 101 PERIODICITY AND BONDING



Time: 01 Hour

Answer all questions.

1. (a) Briefly explain, using relevant examples in each case, three of the following
- (i) Resonance
 - (ii) Hybridisation
 - (iii) Types of bonds
 - (iv) Quantum numbers
- (b) Boiling point of 2-nitrophenol (214°C) is so different from that of 4-nitrophenol (249°C) Explain. (42 marks)
- (c) Showing x, y and z axes, draw the following orbitals: (20 marks)
- (i) P_z
 - (ii) d_{xy}^{2-y²}
 - (ii) d_{xy}
- (d) Explain, with an example in each case, the following: (18 marks)
- (i) Pauli's exclusion principle
 - (ii) Hund's rule

2. (a) What do you understand by the Valence Shell Electron Pair Repulsion (VSEPR) theory (20 marks)

Predict the shape of each of the following molecules using VSEPR theory

- (i) BeCl₂
- (ii) BCl₃
- (iii) CH₄
- (iv) NH₃

(b) Write down the molecular orbital electronic configurations of the following (50 marks)
O₂, O₂²⁻, N₂ and NO

In each case

- (i) Calculate the bond order
- (ii) Predict the magnetism

(50 marks)