# 22.3.1: i. Review Exercises

## Q1

For the given orbital occupations (configurations) of the following systems, determine all possible states (all possible allowed combinations of spin and space states). There is no need to form the determinental wavefunctions simply label each state with its proper term symbol. One method commonly used is Harry Grays "box method" found in **Electrons and Chemical Bonding**.

$$a.) \quad CH_2 \quad 1a_1^2 2a_1^2 1b_2^2 3a_1^1 1b_1^1 \tag{22.3.1.1}$$

$$b.) \quad B_2 \quad 1\sigma_g^2 1\sigma_u^2 2\sigma_u^2 1\pi_u^1 2\pi_u^1 \tag{22.3.1.2}$$

$$c.) \quad O_2 \quad 1\sigma_g^2 1\sigma_u^2 2\sigma_g^2 2\sigma_u^2 1\pi_u^4 3\sigma_g^2 1\pi_g^2 \tag{22.3.1.3}$$

$$d.) \quad Ti \quad 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 d^1 4d^1 \tag{22.3.1.4}$$

$$e.) \quad Ti \quad 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2 \tag{22.3.1.5}$$