(a) Explain carefully the meaning of a Hoare specification \( \{P\} C \{Q\} \) and describe the nature of \( P \), \( C \) and \( Q \). [4 marks]

(b) How can terms in higher-order logic be used to represent \( P \), \( C \) and \( Q \)? Give the types of the terms. [4 marks]

(c) Describe the meaning of the weakest liberal precondition (\( \text{wlp} \)) and the strongest postcondition (\( \text{sp} \)). [4 marks]

(d) Define \( \text{wlp} \) and \( \text{sp} \) in higher-order logic. What are the types of \( \text{wlp} \) and \( \text{sp} \)? [4 marks]

(e) Explain the relationships between Hoare specifications, weakest liberal preconditions and strongest postconditions. What is the importance of this for automating program verification? [4 marks]