Compositional semantics is concerned with modelling the meaning of phrases and sentences. It relies on the principle of compositionality, which states that the meaning of a phrase or a sentence can be derived from the meanings of its parts, guided by syntactic structure.

(a) What do the following examples demonstrate about the difficulties that compositional semantic models face?

(i) it snows

(ii) rock the boat

(iii) enjoy a cigarette
       enjoy a book

(iv) inject life
       inject hydrogen

[2 marks each]

(b) Distributional representations of phrases and sentences can be derived by combining, or composing, the distributional representations of individual words in them. Briefly describe:

(i) three limitations of vector mixture models;

(ii) how lexical function models address these limitations.

[3 marks each]

(c) Describe how adjectives can be represented as lexical functions and how such lexical functions can be learned from a text corpus. [6 marks]