

COMPUTER SCIENCE TRIPOS Part IA – 2021 – Paper 1

3 Object-Oriented Programming (acr31)

A programmer is using a cut-down version of Java that does not support static fields or inheritance (neither extends nor implements). Static methods and static inner classes are still supported.

(a) What are the implications of this for static methods in terms of:

(i) access to static fields; and [1 mark]

(ii) access modifiers. [1 mark]

(b) Describe how a programmer might use a shared instance of an environment object to emulate static fields. Consider:

(i) sharing state between all instances of a class; [4 marks]

(ii) access-modifiers; and [6 marks]

(iii) initialisation. [4 marks]

(c) What are the drawbacks and benefits of your scheme compared to static fields? [4 marks]