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Computer science
Higher level
Paper 3

Monday 11 November 2019 (morning)

1 hour

Instructions to candidates

- Do not turn over this examination paper until instructed to do so.
- A clean copy of the **computer science case study** is required for this examination paper.
- Read the case study carefully.
- Answer all questions.
- The maximum mark for this examination paper is **[30 marks]**.

Answer **all** questions.

1. (a) Identify **two** smartphone resources that might limit the user experience of the Bangbai app. [2]
 - (b) Outline why an application programming interface (API) would be useful when developing a smartphone app which uses the CAD system. [2]
 2. (a) Outline how a smartphone uses data from GPS satellites to obtain its location. [4]
 - (b) Rahul has stated the importance of a multi-tier architecture using standard protocols. Explain why this approach is important. [4]
 3. It is expected that at any given time during a normal day, there will be between 50 and 100 members of the public interacting with each individual server in the cluster. If the network card in one of the servers breaks while being used, it is very likely that the users connected to it would still be able to complete their current operations without any inconvenience.

Explain why this hardware problem would not seriously affect the users who are currently connected to that particular server. [6]
 4. Some people have asked if the informing function of the Bangbai app could allow the anonymous reporting of incidents and issues. They believe that potentially useful information (for example, information about criminals) might not be reported because people are afraid of their identities being discovered.

To what extent might it be technically possible for the Bangbai app to guarantee the anonymity of its users if this feature was approved? [12]
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