Diploma Programme
Programme du diplôme
Programa del Diploma

Computer science
Higher level
Paper 3

Monday 6 November 2017 (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]**.

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Answer **all** questions.

1. (a) Define *bioinformatics* and give an example of the data used in medical research. [2]

(b) Outline **one** feature of fuzzy logic which makes it suitable for medical diagnosis. [2]

2. (a) Compare ultrasound and a CT scan in the creation of a medical image. [4]

(b) Outline **two** compatibility issues that might be faced with the introduction of Electronic health records (EHRs) in a large country. [4]

3. With reference to the technology involved, explain how augmented reality imaging could be used to assist a surgeon in one country to carry out a complicated operation under the supervision of an expert surgeon in another country. [6]

4. A new health centre is planned in a remote mountain area to serve a community which is scattered over a large area. The nearest large hospital with complete medical services is difficult to reach.

The services to be offered in the new health centre should include:

- health carers at the health centre for visits made by appointment
- expert doctors from other locations, who are available 24 hours a day via a VPN connection
- a comprehensive care system for chronically sick patients at home
- some visiting health workers
- some provision for emergency operations in the health centre
- diagnostic equipment to identify cases where a person needs to be treated at the large hospital.

The planners are also considering whether to create an internet site with authorized access for the community.

With reference to the technologies involved, discuss ways in which the required services could be met and their effect on the people in the community. [12]