

BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 6 Professional Graduate Diploma in IT

IT AND THE ENVIRONMENT

Wednesday 28th September 2016 - Morning

Answer **any** THREE questions out of FIVE. All questions carry equal marks.

Time: THREE hours

Answer any Section A questions you attempt in Answer Book A

Answer any Section B questions you attempt in Answer Book B

The marks given in brackets are **indicative** of the weight given to each part of the question.

Calculators are NOT allowed in this examination.

SECTION A

Answer Section A questions in Answer Book A

- A1. Power management features are now commonly available in both laptop and desktop computers.
- a) A lot of the corporate use of personal computers is in an office environment. Discuss THREE areas of power use which need to be addressed in order to optimise energy use in this situation. **(12 marks)**
 - b) Write a brief report discussing the difference in approach which you should use when looking at the purchase of new equipment and the management of legacy hardware. **(13 marks)**
- A2.
- a) Briefly describe FOUR technologies which can be used for the remote sensing of environmental data. **(8 marks)**
 - b) For ONE of these technologies, discuss how data collected by such a technology could be stored and managed as part of a long-term project. **(8 marks)**
 - c) With reference to a specific example, write a brief article or blog-post discussing how the remote sensing technology you described in (b) could benefit the natural environment. **(9 marks)**

Turn over]

SECTION B
Answer Section B questions in Answer Book B

- B3. You work for a company which makes and installs air conditioning units. You have been given the job of developing and implementing a system to manage the air conditioning (a/c) systems in a city's major shopping malls. There are three malls, each of different sizes: each has a different "maximum" capacity (the biggest number of people who can be inside at a time).

The requirements for the a/c system are for it to cool the mall to a target temperature of 25 degrees; to operate during the hours of 0900 – 2000 and to be active only when the number of people in the mall is over 35% of its capacity. Each mall will have two separate a/c systems: a state-of-the-art free air cooling system and an older refrigeration system which should only be used when the outside temperature exceeds 35 degrees. Currently these older systems run continuously from 0900 – 1900, and are set to deliver 30 degrees.

The cost of this new system will be paid for by the city council increasing the rental for each shop in the malls by 1%. Some shop owners have objected to this, and you have called a meeting to explain the new system.

Give an outline of the presentation you will make, focusing on the following areas:

- a) How the overall system will operate, with particular reference to the IT components. Your answer must include an explanation of the sensors required, and how they will be used to control the a/c units. **(15 marks)**
 - b) It is also proposed that the individual shops in the malls will be supplied with smart meter technology, and that these smart meters and the a/c control unit will be linked to the energy company's smart grid. Explain how a smart grid would operate to try to increase energy efficiency in the malls and in the energy network. **(10 marks)**
- B4. Your business has been approached by a UK-based charity which specialises in recovering unwanted computer systems from UK businesses. The charity can offer equipment for reuse, repurpose or recycling, with different cost models: reusable computers will cost you more to buy than those for repurposing; those to be recycled can be bought at very low cost. You and your business partners decide to become involved in this scheme, with the idea of selling on the equipment to your local markets.
- a) Explain the criteria you will use to decide which method (of reuse, repurpose and recycle) to apply to the equipment you collect. Your answer should also indicate any precautions you need to observe. **(15 marks)**
 - b) You have received an enquiry from a potential customer, who is looking for reassurance that its company image will be secure if it buys equipment from you. What are the main points you will use in order to provide that reassurance? **(10 marks)**

Turn over]

B5. You have been appointed to advise the government of an island nation. The nation is particularly proud of its natural environment, especially its forests and beaches. A major cloud computing service provider has proposed locating their regional data centre on the island, promising to pay for the entire infrastructure and to follow all the best practice for sustainability and energy efficiency of server farms. This will include the use of renewable energy sources. The company has also promised they will provide 50 IT jobs for local people, and to expand current energy and IT supply facilities so that local people can use them. The government has asked you to report on whether they should accept the provider's offer.

- a) What are the main issues affecting the location and operation of a large data centre which you would advise the government to consider? **(14 marks)**
- b) The service provider wants to start an advertising campaign promoting the way in which its data centre will provide computing resources without affecting the natural environment of the island. Do you think this should be approved? Explain your answer. **(11 marks)**