SYSTEMS DEVELOPMENT

CMP-4013A

Time allowed: 2 hours

Answer QUESTION 1 in section A and any TWO questions from section B.

All questions carry equal weight.

Notes are not permitted in this examination.

Do not turn over until you are told to do so by the Invigilator.
SECTION A

1. 

a) A company is keen to discover where its customers are using its mobile app, so that it can encourage adverts from nearby businesses. It asks its developers to install code in the app that will periodically report location information. Since the company is not sure whether it intends to make this feature permanent it asks the developers to hide this from customers.

Describe the main provisions of the BCS Code of Conduct that may be relevant to this situation and in relation to professional codes of conduct, explain whether you believe it is right for the developers to implement this request.

(16 marks)

b) TalkTalk is a major ISP, with approximately 4.27 million customers at the end of 2014. It has suffered a number of security breaches and problems, summarized below.

- A manager in the TalkTalk chief executive’s office was warned of a suspected data breach in July 2013.

- In August 2014, the company revealed its mobile sales site had been targeted and personal data breached. A third party contractor was involved in the loss. The hack seems to have used a distributed denial-of-service (DDoS) attack as cover for a SQL injection attack that accessed the data.

- A data breach was uncovered when TalkTalk investigated a sudden rise in complaints from customers about scam calls between October and December 2014 on its forums. The callers seemed to be from India and had customers’ TalkTalk account numbers, names and addresses. The account number is not publicly available; it is held on TalkTalk’s systems and is used in customer support.

- In February 2015, TalkTalk warned its customers about scammers who had stolen thousands of account numbers and names. According to TalkTalk, a third-party contractor that had legitimate access to its customer accounts was involved in a data breach in 2014, giving the attackers access to some TalkTalk customer data. More than 3,000 of TalkTalk’s customers complained about receiving calls from the scammers. It is thought that at least 20 may have lost money.
TalkTalk suffered "significant and sustained cyber-attack" on its website on 21 October 2015. The compromised data includes: bank account numbers and sort codes, obscured credit and debit card details (first 4 and last 4 digits of the card number), customer email addresses, names dates of birth and phone numbers, and TalkTalk account information. Not all the data was encrypted. Names, home addresses, phone numbers and TalkTalk account numbers were stolen. TalkTalk issued several statements on the size of the data loss as the extent of the problem became clear. The company said that fewer than 21,000 unique bank account numbers and sort codes had been accessed and fewer than 1.2m customer email addresses, names and phone numbers. Fewer than 28,000 obscured credit and debit card details (first 4 and last 4 digits of the card number) and 15,000 customer dates of birth had been accessed.

(i) Describe the main provisions of the current UK legislation that apply to TalkTalk’s storage and handling of customer data.

(8 marks)

(ii) Describe the systems and measures that the company should implement to prevent similar data loss incidents. You must justify your recommendations to show how each one would improve the security of the company’s data.

(16 marks)
SECTION B

2. When building a system, a critical part of the planning is the gathering and analysis of requirements. These requirements can come from many different sources and many different stakeholders, often by interview or examination of current business practice.

a) One definition of a stakeholder is someone who “has a vested interest in or control over the project”.

(i) Do you agree with this definition? Can you provide a more detailed or alternative definition?

(4 marks)

(ii) List four types or groups of stakeholders common in a system development project

(8 marks)

b) Requirements gathering is often seen as the most important part of the development process, and is often iterative by nature. Imagine you have been asked by a board of directors to explain this step in the development process by producing a brief written report covering why requirements are important, how you will go about it (gathering and analysing), and any general considerations to be made.

(10 marks)

c) Bob’s Trustworthy Savings and Investment Company (known as BobBank) wish to implement a new system to track customer accounts (current accounts, loans, mortgages, savings accounts) and investments (stocks and shares). Currently the company has a mainframe running software from 1983 to handle its customer accounts. For investments BobBank use three broker firms, each of which has their own software installed on the BobBank network.

Not only is the mainframe system very slow and difficult to use (terminal based), but each of the three investment software systems are very different from each other and have their own quirks. To find the best prices staff will often have to use each of them in turn to look up a stock and associated fees.

The board of directors have called you in to look into the feasibility of building a replacement modern system, and the first step will be to gather the requirements.

With regard to the case study above, identify key stakeholder groups and describe in detail how you will go about gathering the requirements, along with any other overarching considerations you think may be present.

(18 marks)
3. When a new system is required there are, very generally, two approaches; build a new system from scratch or use an existing system (buy – or use free software, “off the peg”).

a) There are advantages and disadvantages to both approaches. For each type of approach detail two advantages and two disadvantages with a brief description of each.

(12 marks)

b) In reality it is rarely as black and white as “build something completely from scratch” or “buy something that does everything out of the box”, and there will be some reuse or some customisation. Most systems are somewhere on the scale from brand new to readymade.

Describe two ways in which systems can be somewhere on this scale from brand new to ready-made and what this means in terms of the development of a system and the processes that must be followed.

(12 marks)

c) Consider the following two systems: a home accountancy package and a Mars lander controller.

(i) Which approach would you recommend for each of these? Justify your answer.

(4 marks)

(ii) Your company needs a flight computer for a new type of jet aeroplane it is building? Detail the considerations/investigations you would need to make before you could decide which would be the best option for satisfying this need?

(12 marks)
4.  

a) Projects are often classified into three categories: successful; challenged, and failed.  

(i) Describe the outline criteria that are used to decide on a project’s classification.  

(6 marks)  

(ii) Some people argue that this method understates the “successful” percentages. Explain why this might be the case. What is your opinion and why?  

(6 marks)  

b) Explain the effects of the following factors on the success of systems development projects:  

(i) Experienced developers.  

(ii) Executive support.  

(iii) Enthusiastic stakeholders.  

(6 marks)  

c) Describe four other factors that influence the success of systems development projects.  

(8 marks)  

d) To what extent were the seven factors identified in part (b) above contributors to the Challenger Space Shuttle disaster? Please justify your answer.  

(14 marks)  

END OF PAPER