

THIS PAPER IS NOT TO BE REMOVED FROM THE EXAMINATION HALLS

UNIVERSITY OF LONDON

CO3314 ZA

BSc Examination

**COMPUTING AND INFORMATION SYSTEMS AND  
CREATIVE COMPUTING**

**Software Engineering Management**

Friday 9 May 2014 : 14.30 – 16.45

Duration: 2 hours 15 minutes

There are FIVE questions in this paper. Candidates should answer **THREE** questions. All questions carry equal marks and full marks can be obtained for complete answers to **THREE** questions.

Only your first **THREE** answers, in the order that they appear in your answer book, will be marked.

There are 75 marks available on this paper.

Questions involving a description or explanation should, wherever possible, be accompanied by an appropriate example.

A hand held calculator may be used when answering questions on this paper but it must not be pre-programmed or able to display graphics, text or algebraic equations. The make and type of machine must be stated clearly on the front cover of the answer book.

**NOTE:**

**AN OUTLINE SPECIFICATION FOR A HYPOTHETICAL SYSTEM IS  
USED IN ALL OF THE QUESTIONS IN THIS PAPER AND IS  
APPENDED TO THIS PAPER ON PAGES 5-6.**

**READ IT CAREFULLY BEFORE ATTEMPTING TO ANSWER ANY  
QUESTIONS.**

© University of London 2014

UL14/0775

### Question 1

#### *Functions, estimates and monitoring*

Study the outline specification for *BOOKIT*, appended to this examination paper, and then answer **all** parts of this question.

- a. For each of the subsystems of *BOOKIT*, list and describe briefly each of its main functions and the items of data it handles.

**8 marks**

- b. Taking account of the number and complexity of the functions and data items, estimate the amount of effort required in **each** phase of the software development for each subsystem to arrive at a rough initial estimate of the **total effort** required. Explain your reasoning.

**7 marks**

- c. Estimate the person-hours required to complete the software development.

**5 marks**

- d. (i) How would you monitor the development to ensure that it was completed by the specified deadline?  
(ii) What would you do if slippage appeared likely?

**5 marks**

### Question 2

#### *Quality goals*

Study the outline specification for *BOOKIT*, appended to this examination paper, and then answer **all** parts of this question.

- a. Define the quality goals that you will set. Explain the reasons for your choices and describe how you will determine if they have been met.

**15 marks**

- b. What will you record about *BOOKIT* in your company's '*corporate memory*'? Explain why you need this information and how; when might this information be used?

**10 marks**

### Question 3

*Life-cycle, testing methods and development team*

Study the outline specification for *BOOKIT*, appended to this examination paper, and then answer all parts of this question.

- a. How will you ensure that *BOOKIT* meets the real requirements of the customer? Your answer should focus especially on the following aspects:
- (i) Choice of life-cycle models,
  - (ii) Testing methods,
  - (iii) The way in which the necessary activities affect the project plan,
  - (iv) The organisation of the development team and the roles assigned.
- 16 marks**
- b. Briefly describe how and why you would employ Fagan Inspection during the development of *BOOKIT*.
- 9 marks**

*(Note: You are not required to describe in detail how Fagan Inspection is generally practised; only to state what you would do for this particular project.)*

#### Question 4

##### *Risks, causes and consequences*

Study the outline specification for *BOOKIT*, appended to this examination paper, and then answer all parts of this question.

a. Identify four operating risks for the *BOOKIT* system (i.e., risks that might materialise after the system goes into operation) and, in **each** case:

- (i) State the causes and consequences of the risk,
- (ii) Assess its magnitude,
- (iii) Describe the steps you would take to reduce its impact.

**15 marks**

(Note: You may wish to use a table format for this answer.)

b. What product attributes would you measure during the development, test and trial of *BOOKIT* that would help you to assess the magnitude of operating risks? Explain the reasons for your choice.

**10 marks**

#### Question 5

##### *Dependability measures*

Study the outline specification for *BOOKIT*, appended to this examination paper, and then answer all parts of this question.

a. In order to evaluate some dependability measures, it is necessary to measure system operating time. State what you would record about operating time in *BOOKIT*, and how you would collect these data.

**8 marks**

b. What sort of maintenance do you think the *BOOKIT* software will require?

- (i) Describe your maintenance plan.
- (ii) How will you control it?

**12 marks**

c. Explain how the measurement of dependability and of operating time will assist in the planning and control of the *BOOKIT* system software maintenance.

**5 marks**

## **OUTLINE SPECIFICATION**

A chain of discount bookshops would like to offer a simple Internet shopping service. The owners have sought advice and come up with a basic specification of what they want and have contacted your business (a small software engineering company, with 9 technical staff, specializing in developing small scale web-based systems). You arrange to meet to discuss their outline specification.

For this system the customer is required to identify him/herself by giving a unique customer username and a personal password. A specialized system (called 'SHOPIT') will verify that the account is valid and will get customer details from a customer accounts system (which you term 'CUSTACC'). If the customer is not registered then a new account will be created. Otherwise the account is checked to see if it is in order. Subsequently, if everything is in order, SHOPIT will display an order form. The order form will contain a delivery address and a list of discount books currently available and in stock. The customer will fill in quantities for the items wanted and, when finished, will confirm the delivery address and enter a preferred range of delivery dates and times. It is strict requirement that the customer should be able to see all items ordered at any point, and must be able to cancel any items already selected before checkout is initiated. The customer should also be able to access and change personal account data, and to see all their previous orders.

Information about the items ordered, detailing quantities and costs, is passed to CUSTACC; CUSTACC will initiate a payment request via a secure transaction processing system that, in turn, will access the customer's PAYPAL account. When payment is confirmed, SHOPIT should issue the customer with an Order Reference Number and pass the order details and customer data to an integrated stock control system ('STOCKSYS') and to a courier company (via a system named 'POSTIE'). NB. As POSTIE is an independent system that accepts data from many shopping websites and negotiates delivery to customers via email and a telephone call-centre, it is an external paid-for resource and hence not part of the specification.

STOCKSYS must initiate a packing list and an optimal picking route in the warehouse for the items ordered, produce an invoice with required sales tax details and, when the order has been filled, notify POSTIE that the customer order is ready for collection, and update the warehouse stock levels. Every 24 hours a Stock Levels Report should be produced and verified against actual physical stock levels (all books in the warehouse will be electronically tagged) and re-orders generated if necessary. Any discrepancies are to be recorded in an alert message and report for the Warehouse Manager.

You conclude that what they want, in essence, is to allow existing customers to shop online using the existing catalogue with minimal impact on existing processes (such as managing the supply chain and warehousing system). You identify that there is a small network of retail outlets and a central warehouse (with a related stock-control system) that will have to supply the

company that delivers. You decide to put in a bid for the project and choose the name BOOKIT as a working title.

*Now study the above, and answer the examination questions.*

**END OF PAPER**