UNIVERSITY OF LONDON   **CO3314 ZB**

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:

A DESCRIPTION OF A HYPOTHETICAL SYSTEM IS USED IN ALL OF THE QUESTIONS IN THIS PAPER AND IS APPENDED TO THIS PAPER AS PAGES 5-6.

READ IT CAREFULLY BEFORE ATTEMPTING TO ANSWER ANY QUESTIONS.

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Question 1
Functions, estimates and monitoring
Study the description of *APC's* systems, appended to this examination paper, and then answer **all** parts of this question.

a. For each of the subsystems of a redeveloped *SHED*, list and describe briefly each of its main functions and the items of data it would handle.

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
Risks, causes and consequences
Study the description of *APC's* systems, appended to this examination paper, and then answer **all** parts of this question.

a. Identify **four** operating risks for a revamped *SHED* system (*i.e.*, risks that might materialise after it goes into operation) and, in **each** case:
(i)   State the causes and consequences of the risk,
(ii)   Assess its impact,
(iii)   Describe the steps you would take to reduce its magnitude.

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 a redeveloped *SHED* that could help you assess the magnitude of operating risks? Explain the reasons for your choices.

10 marks

Question 3
Dependability measures
Study the description of *APC's* systems, 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 a redeveloped *SHED.* Describe how you would collect these data.

8 marks

b. What sort of maintenance do you think the *SHED* 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 *SHED* system software maintenance.

5 marks

Question 4
Life-cycle, testing methods and development team
Study the description of *APC's* systems, appended to this examination paper, and then answer **all** parts of this question.

a. How will you ensure that a redeveloped *SHED* 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. Decide if you would employ Fagan Inspection methods during your development process. Justify your decision.

9 marks

(Note: You are not required to describe in detail how Fagan Inspection is generally practised; only to state what its relevance for this particular scenario.)

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Question 5

Quality goals

Study the description of *APC's* systems, 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 would determine if they have been met.

15 marks

b. What might you record about *APC* as part of your company's *'corporate memory'?* How and when might this information be used?

10 marks

DESCRIPTION OF APC's OPERATIONS

A local business – Andrew's PC repairs ("APC" for short) - is a small high-street shop that offers computer repairs and motherboard upgrades configured to the customer's specification: computers can be fitted with new or reconditioned motherboards, or, if appropriate, can have the original repaired and re-fitted; memory and hard discs can be upgraded; power supplies can be reconditioned or new, higher performance power supplies fitted.

A lead-technician and a junior technician carry out these repairs in a small workshop behind the shop-front and customer service desk. This is also an area where stock (power supplies, hard disks, memory chips and CPUs) is stored.

The General Manager working at the front desk has direct access to specialised online databases of CPUs, hard discs, power supplies *etc.*, and to the company's own simple PC-based work-scheduling system (nicknamed "SHED" by company employees). Any member of staff can take telephone PC-service requests to book appointment dates in SHED for customers and to schedule PC repairs, memory upgrades, new power supplies *etc.* For some simple tasks (new graphics card fitted; basic memory upgrades *etc.*) customers may choose to visit the shop and wait for the upgrade to be fitted at the next available job-slot.

SHED requires information to be input on the type of job and type of parts needed (new or recondition power supply, commonly-used memory upgrades, specialised hard discs, etc.) and prints out a list of items required for specific jobs. This printed list is used for a visual check that part(s) are in stock and to double-check in the hand-written stock book. If not in stock, then the item must be ordered and a future appointment slot with the customer arranged. SHED stores individual job and time details and, to schedule workshop activity, produces daily job lists with the relevant details. These are stored in a large ring-binder folder in the front office and can be updated by hand if required.

When jobs are completed, the lead-technician notifies the General Manager and signs off the job in the folder, also checking at the same time that the stock book has been updated. The General Manager must then use SHED to match those jobs with customers and produce invoices for payment.

The owner, Andrew, thinks that this system could somehow be improved by further computerisation. You manage a small software company, with five technical staff, specialising in bespoke IT solutions. Your staff have strong programming and general analysis skills, and in addition some members of your team are experienced in project development. After studying the situation, you come up with an outline specification and plan for improving and

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redeveloping SHED to incorporate a customer database and to link it to a new stock-control system.

Now study the above, and answer the examination questions.

END OF PAPER