UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For the following qualifications :-

B. Sc.

Comp Sci B160: Information Systems Analysis and Design (ISAD)

COURSE CODE   :   COMPB160

UNIT VALUE   :   0.50

DATE   :   18-MAY-01

TIME   :   10.00

TIME ALLOWED   :   2 hours 30 minutes

Answer three questions only. All questions carry equal marks.

1. (a) Identify six properties of a system.

[12 marks]

(b) Explain the relationship between a model, and that which it is claimed to model, using the terms *correspondence* and **abstraction.**

[6 marks]

(c) What is meant by the term soft in soft systems thinking?

[3 marks]

(d) Stage 5 in the Soft Systems Methodology (SSM) is concerned with comparing the real world with the systems world. Describe exactly what is compared by referring to the products of other relevant stages in SSM and explain why this comparison is considered central to the SSM approach.

[12 marks]
Total 33 marks

2. (a) Why do we need to be concerned with the, pragmatic and semantic aspects of information when we design information systems?

[9 marks]

(b) What are the best ways of getting an understanding of the pragmatic aspects of information in a business setting?

[9 marks]

(c) Outline the practical importance of understanding how information is used for the construction of ONE of the following
    • an E-R model in a structured system specification
    • an Object model in an object-oriented specification.

[9 marks]

(d) Why might the building of an information system prototype early on assist in clarifying a designer's understanding of the way users view and use information?

[6 marks]
Total 33 marks

3. In Soft Systems Methodology (SSM), the function of stages 1 and 2 has been described as `to display the situation so that a range of possible, and hopefully, relevant choices can be revealed'.

(a) One of the most important products of stage 2 is the *Rich Picture*. What does a Rich Picture show?

[9 marks]

(b) Why doesn't the Rich Picture present an objective description of the situation studied?

[4 marks]

(c) The stages of SSM that take place in the `systems world' begin with the specification of Root Definitions. What is a primary-task Root Definition?

[4 marks]

(d) The most important components of a Root Definition are the Transformation and the Worldvfew. Why is this so?

[8 marks]

(e) Define the remaining components of a root definition.

[8 marks]
Total 33 marks

4. Propose an appropriate software development process model for each of the situations described below. In each case justify your recommendation. You may assume that technical staff with experience in working the way you propose are available.

(a) The development of a system to automate a well-understood, routine administrative task in a stable operating environment. A similar project has been carried out recently. It took six months from initial request to final handover.

[I 1 marks]

(b) The development of a novel way to support information sharing among a team of experts in a particular scientific field. A fixed amount of funding is available initially. More funding may be made available in the future but the environment is undergoing rapid change.

[I 1 marks]

(c) Customisation, through the design of user interfaces and database back-ends, of a large off-the-shelf application package. Customisation is to be tailored for different major user groups within the organisation and the whole process is expected to take several years although it has been difficult to estimate this with any accuracy.

[I 1 marks]
Total 33 marks

5.   (a)   A structured system specification includes a functional model of the system. The functional model has three components. Briefly describe these and explain their relationships to one another.

[9 marks]

Draw a context diagram for the work planning system described below.

A garage offers a tyre fitting service to vehicle owners. To schedule the work of fitting new tyres and repairing punctures in the workshop bays office staff take requests for service from customers and agree appointment dates with them. They request any tyres needed for jobs from the storeman who notifies them when stock is available. Job lists are produced for the workshop and the workshop manager notifies the office staff when jobs are completed. To keep track of work planning the office staff keep records for themselves of various things including outstanding requests for items from the stores and workshop staff rotas.

[12 marks]

Entity-relationship (E-R) diagrams are often the basis of data models. In these diagrams the cardinality of relationships is shown. What does cardinality mean in this context? What is the difference between a strong entity and a weak entity in an E-R model?

[6 marks]

(d)   Draw an entity-relationship diagram to represent the entity types *sales person, customer* and *vehicle* and the relationships between them which is consistent with the following scenario.

A garage employs a team of sales persons to sell new and used vehicles. New customers are assigned to a particular member of the sales team so that a personal service can be offered. Customers purchase vehicles from those available in stock. Details of vehicles and who bought them are retained for some time after a sale so that a history of dealings with individual customers, who may be corporate customers buying vehicles for company fleets, can be built up.

[6 marks]
Total 3 3 marks

END OF PAPER