

ANSWER 1 QUESTION FROM PART I, AND 2 QUESTIONS FROM PART II

PART I

**1. Soft Systems Methodology (SSM)**

(a) Analysts can choose from a wide range of *Factfinding* methods, including:

- i. Questionnaires;
- ii. Interviews;
- iii. Work observation.

Describe how you would use each of these 3 methods to elicit different types of information (formal/informal, quantitative/qualitative, subjective/objective) from the owners, actors and clients in a project designing a Web-based course assessment system for UCL.

[18 marks]

(b) The output of Stage 4 of a Soft Systems Analysis – the *Conceptual Model* - is rarely implemented in its entirety in a software development project.

Explain the purpose of developing the Conceptual Model and its benefits for the system development process.

[10 marks]

(c) Compare SSM to Business Process Re-engineering (BPR). Which method is more suitable as a framework for the system development process? Explain your answer.

[12 marks]

[Total 40 marks]

## **2. Semiotic Analysis**

- (a) Systems analysis and design involves abstracting a real-world situation into a formal system. Describe this process and state what analysts can do to ensure that all required characteristics are represented correctly in the formal system.

[15 marks]

- (b) Why do teams or groups in the workplace develop jargon? Explain why a systems analyst has to be able to identify when and how jargon is being used.

[8 marks]

- (c) Norms guide general behaviour of individuals and groups in organisations, and the interpretation of information in particular. Name and describe the five types of norms.

[5 marks]

- (d) Identify 3 norms which affect student assessment of the quality of courses taught at UCL. Explain briefly why these norms could affect the effectiveness of a Web-based course assessment system.

[12 marks]

[Total 40 Marks]

## PART II

### **3. Data Flow Diagram (DFD)**

A university has a Web-based coursework system, which allows students to request, complete and submit on-line coursework.

Lecturers have a user\_id and password. Once identified, they can submit names of their students to the system, or request student marks.

Students have a user\_id and password. The system checks that the student has not completed this assignment previously (i.e. that no mark is registered for this particular student and the assignment requested).

If the student is eligible, the system will request an assignment from the database server (an external entity).

When the assignment is received, it is displayed for the student to complete.

Students submit the assignment by clicking a SUBMIT button.

The system processes the assignment; the result is displayed to the student and written to a file.

(a) Draw a context diagram for the Web-based coursework system.

[12 marks]

(b) Draw a top-level DFD for the Web-based coursework system.

[18 marks]

[Total 30 Marks]

#### 4. Decision Table

Cashiers at Alton Towers are given the following instructions for admitting persons to the park:

- If the person is under 3 years, there is no admission fee.
- If a person is under 16, half the admission is charged. This admission is reduced to a quarter of full admission if the person is accompanied by an adult (this reduction only applies if the person is under 12).
- Between 16 and 18, half the full admission fee is charged if the person is a student, otherwise full admission fee applies.
- For persons over 18, the full admission fee is charged.
- A discount of 10% is given to people over 16 if they are in a group of 10 or more.
- There are no student concessions on weekends.

(a) Write a decision table which reflects the statements above.

[18 marks]

(b) Identify additional information required to complete the decision table.

[6 marks]

(c) Explain what *atomic* condition and action statements are. Why it is important that condition and action statements are atomic?

[6 marks]

[Total 30 marks]

**5. State-Transition Diagram (STD)**

You are designing an express cash dispenser. A customer with a valid card and Personal Identification Number (PIN) can withdraw cash, provided there are sufficient funds in the account. Draw a state-transition diagram for the cash dispenser. Your diagram should cover possible error conditions, e.g. state what happens when the cash dispenser runs out of cash.

[Total 30 marks]

[END OF PAPER]