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

## PART I

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

(a) At stage 2 of SSM, analysts have to elicit information from the client organisation. Name 3 different techniques for eliciting information; state for each technique

(i) how you would use it to elicit information;

(ii) at which stage of factfinding it can be employed; and

(iii) what type of information it can be used to elicit.

[18 marks]

(b) Employees and managers in a client organisation sometimes have conflicting views of a task. Explain how conflicting views can be represented in SSM, and why it is important to do so.

[10 marks]

(c) Compare SSM to Business Process Re-engineering (BPR), and discuss similarities and differences between the two approaches.

[12 marks]

[Total 40 marks]

***2. Semiotic Analysis***

(a) All languages have a vocabulary, syntax and grammar. Compare vocabulary, syntax and grammar in natural and formal languages.

[9 marks]

(b) 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.

[14 marks]

(c) Data dictionaries define the vocabulary employed in the development and use of a computer system. Describe the 3 types or levels of checks analysts should perform on a data dictionary.

[9 marks]

(d)*Aliases* and *imposters* are two common problems encounter in the course of building data dictionaries. Explain what the two are, and how an analyst would deal with them.

[8 marks]

[Total 40 Marks]

**PART II**

***3. Dataflow diagram (DFD)***

A supermarket chain offers a teleshopping facility. The customer has to identify himself giving his/her customer account number and a password. The teleshopping systems verfies the account and requests customer details from the CUSTOMER ACCOUNTS system. Provided the customer is registered and the account in order, the system displays an order form with delivery address and items available. The customer fills in quantities for the items wanted. The customer should be able to see items ordered at any point, and be able to cancel any items already selected. When the customer is finished, s/he confirms the delivery address and enters a date and time. The teleshopping system forwards this information and the order to the DELIVERY PLANNER system. Information about items purchased also needs to be forwarded to the STOCK CONTROL and CUSTOMER ACCOUNTS systems. CUSTOMER ACCOUNTS, STOCK CONTROL and DELIVERY PLANNER are independent systems and are not controlled by the teleshopping system.

(a) Draw a context diagram for this teleshopping system.

[16 marks]

(b) Identify the top-level processes and datastores required by the system.

[14 marks]

[Total 30 Marks]

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

Draw an STD for an electronic coursework system, which allows students to request and submit assessed coursework electronically.

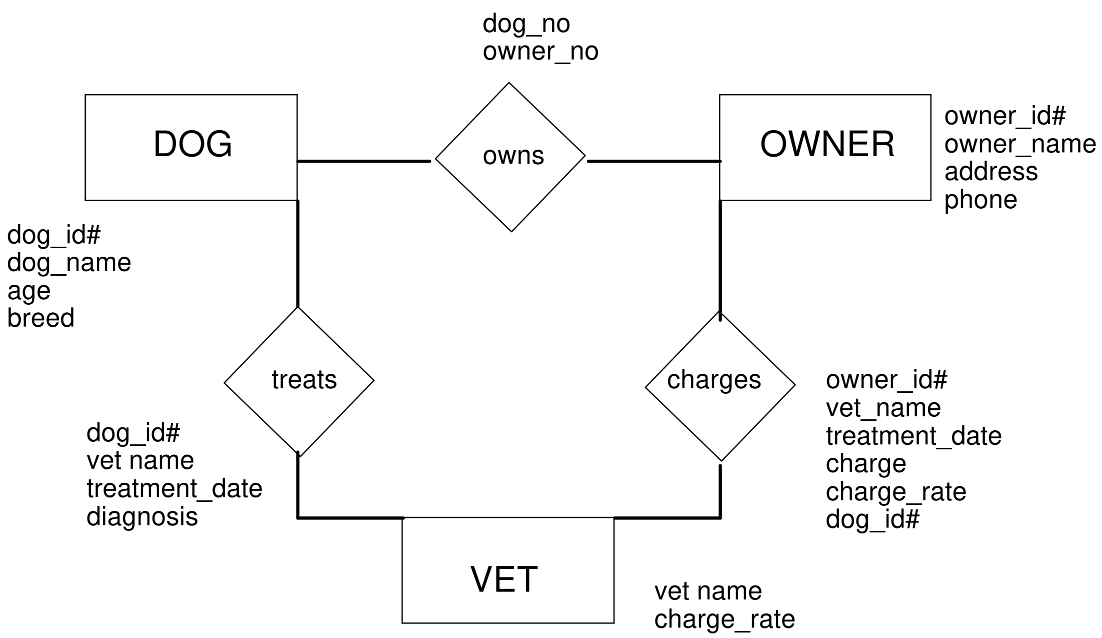
- When a student requests an assignment, the system checks that the student has not completed this assignment previously (i.e. that no mark is registered for this particular student and the assignment requested).
- If the student is eligible, the system will request an assignment from the coursework server.
- When the assignment is received, it is displayed for the student to complete; the student terminates the session by either clicking SUBMIT to submit the coursework, or CANCEL to abandon the assignment.

  If the coursework server fails to produce an assignment after 3 requests from the system, it suspends operation and notifies the lecturer that there is a problem.
- The system confirms submission and processes the assignment; results are both written to a file and emailed to the student.

[Total 30 marks]

### *5. Entity-Relationship-Attribute (ERA) Modelling*

The diagram below is is first-pass ERA diagram of a database system for Canine Health Ltd., a large veterinary surgery specialising in dogs. The firm employs 5 vets (which charge different rates depending on experience), and records are kept of about 500 patient dogs and their owners.




(a) State the cardinality for the relationships, explaining any assumptions you make.

[6 marks]

(b) Turn the diagram into a set of relations. State the identifier attributes for each relation.

[6 marks]

(c) Examine each relation and consider whether it is in 1NF, 2NF, 3 NF. Decompose relationships where necessary.

[18 marks]

[Total 30 marks]

[END OF PAPER]