

### Question 1 (Compulsory)

- (a) What is the purpose of a *preliminary investigation*? [3]
- (b)
  - (i) What is *enterprise resource planning* (ERP) and why is it important? [2]
  - (ii) What is supply chain management? [2]
- (c) Explain two uses of a *prototype* in the systems development life cycle. [2]
- (d)
  - (i) What is *feasibility*? [1]
  - (ii) Is it possible for a project to be considered feasible initially only to be rejected later in the development cycle? Justify your answer. [2]
- (e)
  - (i) What is an online processing system? [1]
  - (ii) Describe *four* characteristics of an online processing system. [4]
- (f) Describe the impact of the Internet on application architectures. [3]

***Question 1 continues on the following page.  
Please turn over***

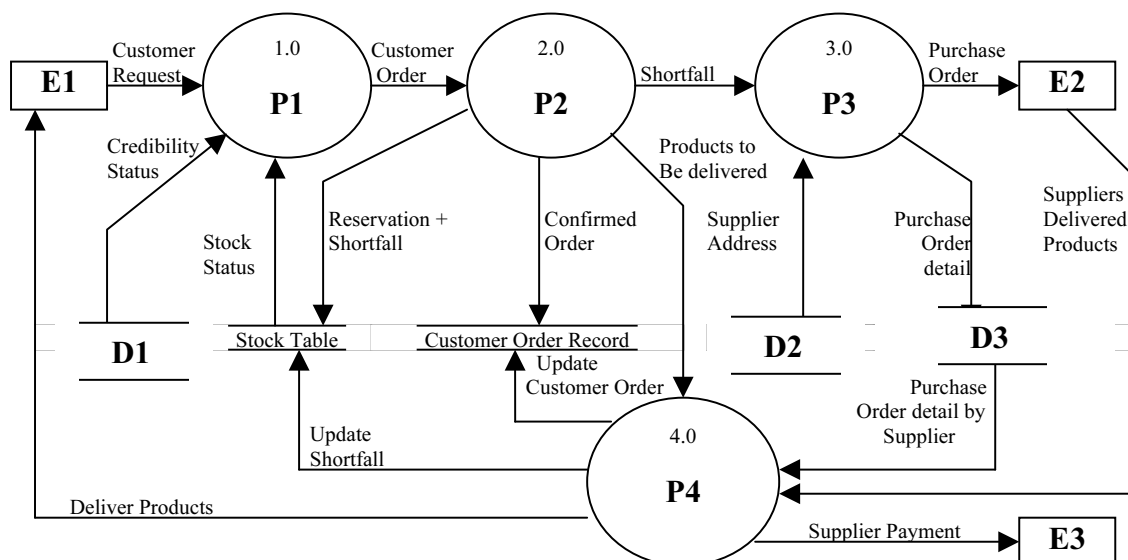
- (g) DistriWorld is a distribution outlet for the latest brands of PC products. Most of the customers are retail outlets that make bulk orders. When a customer makes a request over the phone, the sales executive will check the customer's credibility. If the customer has a poor credibility the order will not be taken. Then the sales executive will check the stock status and advise the customer on the time of delivery. If there is sufficient stock then delivery can be made the next day, otherwise there will be a lead-time for DistriWorld to order from their suppliers. The status of the order is tracked from the customer order record.

The order is then passed to the Procurement department. Here the stock that is due for the customer is reserved and if there are any shortfalls, a purchase order is generated based on the shortfall and the supplier information. A copy of the purchase order detail is printed and sent to the Inventory department to receive the parts from the respective suppliers.

The Inventory department will deliver any products that are ordered the next day. In the case when there is a shortfall, the products will be delivered when shipment for the shortfall arrives. However the supplier may make a partial delivery so the products received will have to be checked against the printed purchase order details. The stock information and customer order record will have to be updated. The Inventory department will have to inform the Accounts department, which purchases order, can be paid. Normally payment will only be made when there is a complete shipment.

Based on the above scenario, identify the missing entities (E1, E2 and E3), processes (P1, P2, P3 and P4), and data stores (D1, D2 and D3) in the following DFD.

[10]



## Question 2

SWL's vice-president of marketing, Amy Neal, wants to change SWL's catalog mailing program and provide a reward for customers who use the Internet. Amy's plan specifies that customers will remain on SWL's mailing list either if they requested a catalog from SWL in the last two years, or if they have signed the guest register on SWL's new Web site. To encourage Internet visitors, customers who register on the Web site also will receive a special discount certificate. You have been asked to design a decision table to document these requirements.

- (a) Design a decision table for the above scenario, listing all possibilities. [6]
- (b) Simplify the table by combining rules where appropriate. [4]
- (c) Create a set of structured English statements to show the policy. [5]

*Please turn over*

### Question 3

The bookstore staff at Pleasant Creek Community College work hard to satisfy students, instructors, and the school's business office. Instructors specify textbooks for particular courses, and the bookstore orders the books and sells them to students. The bookstore wants you to develop an object-oriented model for a new bookstore information management system.

- (a) Identify *one* possible attribute and *one* possible method for each of the classes associated with the bookstore operation. [10]
- (b) Create an object-relationship diagram that provides an overview of the system, including how textbooks are selected by instructors, approved by a department head, and sold to students by the bookstore. [5]

*Please turn over*

### Question 4

- (a) Some systems analysts maintain that source documents are unnecessary. They say that all input can be entered directly into the system, without wasting time in an intermediate step. Do you agree? Justify your answer. [3]
- (b) Terrier News is a monthly newsletter devoted to various breeds of terriers and topics of interest to terrier owners and breeders. Annie West, the editor and publisher, has asked you to help her design a system to enter and manage the hundreds of classified ads that Terrier News publishes. Some advertisements are for dogs wanted; some are for dogs for sale; and some offer products and services.
- (i) Suggest *four* user interface design guidelines that could be used for the new system. [4]
- (ii) Suggest *four* types of controls that might be used on the switchboard you plan to design. Explain why you chose each control. [8]

***Please turn over***

### Question 5

- (a)
  - (i) What are the criteria for a record design to be in third normal form? [2]
  - (ii) How would you convert a non-3NF record design to 3NF? [1]
- (b) Explain the main differences between a file-oriented system and a database environment. [4]
- (c) TopText Publishing is a textbook publishing company with a headquarters location, a warehouse, and three sales offices that have a sales manager and sales reps. TopText sells to schools, colleges, and individual customers. Many authors write more than one book for TopText, and some books are written by more than one author. TopText maintains an active list of over 100 books, each identified by an ISBN number.  
  
Draw an ERD for the TopText information system, and indicate cardinality. [8]

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