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THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATION Certificate

INFORMATION SYSTEMS

10th April 2000 - 10:00a.m. - 12:00p.m.

Time: TWO hours

SECTION A

Answer TWO questions out of FOUR from this section. All questions carry equal marks.

*The marks given in brackets are **indicative** of the weight given to each part of the question.*

1. A company plans to take over a chain of service stations and has employed consultants to investigate the present computer systems. The service stations supply commodities such as petrol, oil, and diesel for vehicles. Each station also provides a small range of goods such as sweets, soft drinks, snacks, and flowers.
 - a) Outline the techniques that could be used to assess the feasibility of such a project. **(10 marks)**
 - b) Describe the following analysis techniques using possible examples from the above scenario:
Dataflow Diagrams
Entity Relationship Modelling
Normalisation (to Third Normal Form) **(20 marks)**

2. You have recently been appointed as a Senior IT Manager of a small computing department. Staff are discontented as their responsibilities are ill defined and the large amount of hardware and software residing in various departments throughout the organisation is either incompatible with other departments or out of date.
 - a) What steps would you take to reorganise the computing department? **(10 marks)**
 - b) Describe **THREE** fact finding techniques you could use to investigate the IT resources throughout the organisation. **(10 marks)**
 - c) Prepare a short report describing factors which need to be taken into account when considering the security of the new networked IT system which needs to be installed. **(10 marks)**

3. Due to business expansion and the desire for new markets, a company needs to introduce an interactive ordering system on the Internet. Its customers may be unfamiliar with the new technology. Special attention therefore must be paid to the design of the interface. The company also requires a resilient and error free system.
 - a) What issues need to be taken into consideration when designing the human computer interface? **(10 marks)**
 - b) Show how you would test your design by highlighting the difference between black box testing and white box testing. **(10 marks)**
 - c) Describe which implementation method is most suitable for introducing this system giving reasons why others are not suitable. **(10 marks)**

[Turn over

4. Information flows throughout an organisation from the management at the top to the lowest level operative and vice versa.
- a) Identify the **THREE** main levels of management information with examples of their usage showing how the information flows between them. **(10 marks)**
 - b) There are several methodologies in use today to analyse and design the requirements of an Information System.
 - i) Describe **TWO** different approaches. **(10 marks)**
 - ii) Outline **TWO** different tools which could assist in the analysis and development process. **(10 marks)**

SECTION B

Answer FIVE questions out of EIGHT from this section. All questions carry equal marks.

*The marks given in brackets are **indicative** of the weight given to each part of the question.*

5. a) Define, using examples, each of the following terms associated with data represented in a Relation:
Identifier
Domain
Tuple. **(6 marks)**
- b) For each of the above terms give an equivalent term associated with data represented in a File. **(3 marks)**
- c) What is the difference between Physical and Logical data? **(3 marks)**
6. From a user's perspective, describe the differences in functionality of the following distributed information system architectures:
- a) File server **(4 marks)**
 - b) Client Server **(4 marks)**
 - c) Corporate Intranet **(4 marks)**
7. State the differences between the following pairs of terms:
- a) Foreign Key - Primary Key **(4 marks)**
 - b) Stored Procedure – Event Procedure **(4 marks)**
 - c) Rapid Application Design - Structured Systems Analysis and Design **(4 marks)**
8. Write short notes on **THREE** of the following information system technologies:
- a) Data Warehousing **(4 marks)**
 - b) Data Mining **(4 marks)**
 - c) E-Commerce **(4 marks)**
 - d) Access and presentation of music and video over the WWW **(4 marks)**

9. Using the data provided in Figure 1 below, give an example for each of the following:

- a) An attribute or attribute type (3 marks)
- b) An attribute that uniquely identifies a value in another attribute (3 marks)
- c) Redundant duplication of data values (3 marks)
- d) Non-redundant duplication of data values (3 marks)

AREA	RESORT NAME	HOTEL	NIGHTS	PRICE
CB	BENIDORM	FLAMINGO	7	265
MJ	PALMA NOVA	JARDIN DEL SOL	7	315
CB	BENIDORM	BALI HAI	7	355
CB	SANTA POSA	HAWAII	7	365
LZ	PLAYA BLANCA	SUN PARK	14	425
CB	BENIDORM	AL HAMBRA	14	499
MJ	PALMA NOVA	SUN PARK	14	719
CB	SANTA POSA	RIVERSIDE	14	719
CB	BENIDORM	TROPICANA	14	719
CB	BENIDORM	HELIOS	28	1129
LZ	PLAYA BLANCA	ATLANTIC PARK	28	1171
CB	SANTA POSA	ROSE DEL BOY	28	1171

Figure 1: Table of Vacancies

10 Explain, using either diagrams or pseudocode, the processing techniques that are required to append a record for each of the following file organisations:

- a) Indexed Sequential file (4 marks)
- b) Inverted file (4 marks)
- c) Random or Hashed file (4 marks)

11. With the aid of an appropriate application (e.g. customer order processing), explain how the following GUI objects could assist a user when interacting with the application of your choice:

- a) Text Box or Single Field (3 marks)
- b) Grid or Table Field (3 marks)
- c) Drop down List (3 marks)
- d) Option or Radio Buttons (3 marks)

12. A Call Centre is an organisation that handles customer orders and queries over the telephone. Telephone operators take a customer call and either answer a query about an existing order, the availability of products or process a customer's order recording the details on a paper form.

How could each of the following stand-alone PC packages be utilised to assist the telephone operators at the Call Centre?

- a) Database package (single user) (4 marks)
- b) Spreadsheet package (4 marks)
- c) Word processor package (4 marks)