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UNIVERSITY OF LONDON **291 0108 ZA**

BSc/Diploma Examination
for External Students

COMPUTING AND INFORMATION SYSTEMS

Information Systems: The Foundation of E-Business

Dateline: Friday 15 May 2009 : 10.00 – 1.00 pm

Duration: 3 hours

There are six questions in this paper. Candidates should answer **FOUR** questions. Full marks will be awarded for complete answers to **FOUR** questions. Candidates must not attempt more than the required number of questions. Calculators are not allowed.

QUESTION 1

(a) Explain why the continuing trends toward connectivity and interoperability provide opportunities for businesses to compete more effectively when using information systems.

[5 Marks]

(b) Using laptop computers as an example, describe five main trends in the way they have evolved in the last 5 years.

[5 Marks]

(c) Discuss why open systems can be viewed both as an opportunity and as a threat.

[5 Marks]

(d) Use the four phases in building and maintaining systems to describe the project of writing a software program and identify challenges or problems that could take place at each phase.

[5 Marks]

(e) Compare the roles of systems analyst and a project manager.

[5 Marks]

QUESTION 2

(a) Compare and contrast physical and logical views of data. Include in your answer at least one example of each.

[5 Marks]

(b) Data can be accessed using either a push or a pull system. Compare and contrast these systems. Include in your answer examples of pre-programmed access and ad-hoc access to such data.

[5 Marks]

(c) Provide a detailed description of Entity Relationship Diagrams (ERDs). Include in your answer the approach taken to model a database when using ERDs.

[5 Marks]

(d) Describe in detail the Relational Database Model. Include in your answer an explanation of the process of Normalisation and Structured Query Language (SQL).

[5 Marks]

(e) Multi-dimensional databases are the technical basis of most data warehouses. Describe in detail the steps involved in the process of creating and maintaining a data warehouse.

[5 Marks]

QUESTION 3

Scenario: NGA Bank

Inside a branch of the NGA Bank, Ms. Brown, a potential mortgage client, and Ms. Blue, a financial advisor with NGA, are sitting in front of a PC running a presentation package. Ms. Brown is Ms. Blue's first client in her new post, the result of a promotion which followed an extended series of appraisal interviews between Ms. Blue and the branch manager, Ms. Green. The specific presentation being run is one the bank has prepared in order to help financial advisors to explain to potential clients the different types of mortgage deals that the bank is offering at any one moment.

Ms. Brown and Ms. Blue are now at a stage in the presentation which involves the financial advisor asking the potential client about certain details relating to financial status (e.g., salary, regular commitments, etc.) and preferences (e.g. fixed or variable interest rate, repayment or endowment, etc.). Ms. Blue has just logged in to the bank's mainframe computer remotely and started a session with a system, known as NGA-SS, specifically designed to capture the sort of customer data just described and suggest which, among those on offer, is the best deal for Ms. Brown. The mortgage deals used by this system were in turn generated by a very large system, known as NGA-MD, that NGA financial analysts use to choose different mortgage deals that will help NGA increase its attractiveness in the face of tough competition.

After Ms. Brown decides on which of the deals she would like to receive more information, Ms. Blue will send an email to Mr. White, the branch's secretary, and ask him to forward a written quote by fax to Ms. Brown's home address along with a covering letter including details about the validity period of the offer.

For this question, you must use the information provided above in the scenario entitled **NGA Bank**.

(a) Explain the difference between personal and impersonal communication and illustrate it with examples from the given scenario.

[4 Marks]

(b) Illustrate the following classes of communication technologies: same-time same-place, same-time different-place, different-time same-place, different-time different-place, using one example for each, taken from the given scenario entitled **NGA Bank**.

[4 Marks]

(c) List four types of information systems that occur in the given scenario, justifying each type that you list with the passages in the scenario that are relevant.

(question continues on next page)

[8 Marks]

(d) For each of the four types of information system you listed in in part (c), briefly explain, using the information conveyed in the given scenario, where in the plan-execute-control cycle it is being applied.

[9 Marks]

QUESTION 4

(a) Define Michael Porter's three basic competitive strategies and provide an example of a company that does one of each.

[5 Marks]

(b) Discuss the performance differences between twisted pair, coaxial cable, and fiber optic cable.

[5 Marks]

(c) Define the OSI reference model and describe what each of its layers represent.

[5 Marks]

(d) Discuss the important differences between star, ring, and bus topologies.

[5 Marks]

(e) Define a value added network (VAN) and list two advantages and two disadvantages of using a VAN.

[5 Marks]

QUESTION 5

(a) Describe in detail the four phases of building and maintaining systems. For each phase, define the key processes, how they are undertaken and what are the outputs.

[10 Marks]

(b) Explain why a systems development project may fail during one of the four phases of building and maintaining systems. Include in your answer at least three examples.

[5 Marks]

(c) There are many obstacles to applying IT effectively within the real world. These include *unrealistic expectations* and the innate *difficulty in building systems*. Discuss these two obstacles and provide an example of each.

[10 Marks]

QUESTION 6

(a) Describe the relationship between Relational Database Systems, Entity Relationship Diagrams and the process of Normalisation.

[5 Marks]

(b) Describe how Transaction Processing Systems are used and explain the difference between real-time and batch.

[5 Marks]

(c) Describe five communication problems associated with using Email as a method of business communication.

[10 Marks]

(d) How can the problem of organisational inertia be addressed by changing an information system?

[5 Marks]