

2910319 Decision support and executive information systems

Examination paper: Zone A

Time allowed: two hours and fifteen minutes

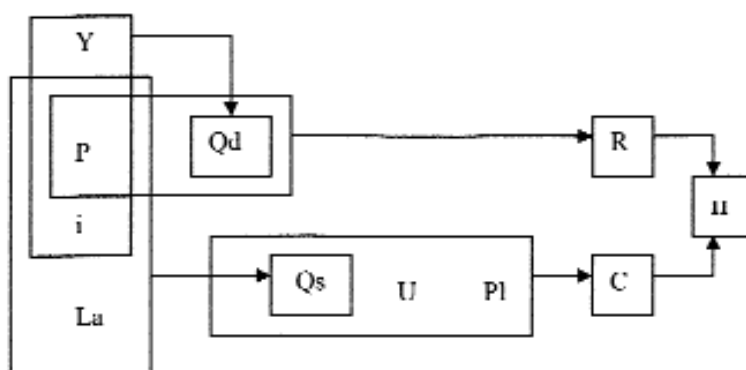
There are **five** questions on this paper.

Do not attempt more than **three** questions. All questions carry equal marks and full marks can be obtained for complete answers to **three** questions.

A hand held calculator may be used when answering questions on this paper but it must not be pre-programmed or able to display graphics, text or algebraic equations. The make and type of machine must be stated clearly on the front cover of the answer book.

Candidates are advised that their answers to all questions will be greatly strengthened by the citing of examples either of their personal experience or from written sources. Full referencing of sources is not necessary; an indication of the nature of the source is all that is required.

1. (a) Outline the different types of computerised information systems that a company may employ and explain their function with particular reference to a decision support system. [13]
(b) How do these systems reflect Herbert Simon's theory of human decision-making? [12]
2. The following diagram is a METAGRAPH incorporating five separate models and used by a building firm to assess the housing market.



- (a) You are required to deconstruct this diagram into the 5 separate models in the form,
 $Y = f(X_1, X_2, \dots, X_n)$

where,

Y – consumer income

La – availability of land

U – unit cost of house-building

C = total cost

P – price of an average house

Qd = demand for housing

Pl – price of building land

π = gross profit

i – money rate of interest

Qs – supply of housing

R – total revenue

[10]

- (b) Discuss the merits of METAGRAPH as a basis for constructing a model-based management system and briefly compare it with Geoffrion's Structured Modelling method.

[15]

3. A public library judges its performance by the "volume of books borrowed per time period". The greater the number of books borrowed, then the more effective it considers its purchasing policy to be. Presently when a book is borrowed the following data is stored in a transactional file.

| | | | |
|----------------------|--------------------------------|----------------------------|-------------------|
| <u>Date borrowed</u> | <u>Date returned</u> | <u>Borrower reference*</u> | <u>Book code*</u> |
| <u>Book category</u> | <u>Number of days overdue,</u> | <u>Fine levied</u> | |

*Borrower reference gives name, address and telephone number.

Book code gives title, author, date of publication and publisher.

You are required to suggest ways in which this data can be re-organised into a multidimensional database model with the focus being on the "volume of books borrowed".

Choose whatever dimensions you think are appropriate and suggest any new data that you think might help the library increase efficiency.

What sorts of questions could the database answer that would be helpful to library staff?

[25]

4. The manager of your department has recently become dissatisfied with the conduct of departmental meetings.
- Explain how you would convince the manager that the adoption of the Nominal Group Technique (NGT) would improve meeting performance. [12]
 - Discuss the extent to which the Delphi Method and/or a computerised Group Decision Support System may improve performance even further. [13]

5. "Incapacity Benefit" is a welfare payment made by the UK Government to UK citizens who are unable to work due to a disability. Eligibility depends on various factors such as,

Certification of your disability by a doctor,
Your age (you must be over 16 and not of pension age),
Having made the necessary National Insurance Contributions,

The amount of payment depends on your,

Marital status,
Number of dependent children,
Number of dependent adults,
Your age when you contacted the disability.

There is much criticism in the UK of the large rise in these types of payment and the allegation of widespread fraud.

You are required to discuss how an Executive Information System (EIS) may assist the Minister of State responsible for these payments to be better informed on the situation and what type of Parliamentary questions it might help to answer.

[25]