UNIVERSITY OF NAIROBI

SECOND SEMESTER EXAMINATIONS 2009/2010

FIRST YEAR EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE
(Microprocessor Technology & Instrumentation)

SPH 108: SYSTEMS ANALYSIS AND DESIGN

Date: **Time: 2 hours**

- **This paper consists of five (5) Questions**
- **Attempt QUESTION ONE and any other TWO Questions**

Question 1

(a) With reference to data flow diagrams, explain the meaning of each of the following terms:
(i) External Entity
(ii) Process
(iii) Data Store
(iv) Levelling
(v) Context Diagram. **[5 marks]**

(b) Kenya Airways initiated a frequent traveler program to encourage passengers to fly frequently and earn awards based on miles flown. The policy is as follows:

Passengers who fly more than 100,000 miles per year and, *in addition* pay cash for tickets or have been flying the airline regularly for more than 5 years receive a free round-trip ticket around the world. Passengers who fly less than 100,000 miles per year and have been flying the airline regularly for more than 5 years also get a free round-trip ticket around the world.

(i) Draw a decision tree based on the policy
(ii) Develop a decision table for passengers free ticket **[6 marks]**

(b) Use a Level-one data flow diagram to represent the following system

When an invoice is received from a supplier, it is checked against a file of authorized purchases. If the invoice does not match an authorized purchase, then it is returned to the supplier with a qurrying letter. If the invoice matches an authorized purchase, but is for an incorrect amount, then it is returned to the supplier with a standard form. If the invoice reconciles, a payment authorization is made out. A cheque is then sent to the supplier, and the invoice and the authorization are filed. **[6 marks]**

(d) State THREE advantages of using DFDs **[3 marks]**

Question 2

(a) Discuss four key questions and requirements concerns that the analyst must answer to understand fully the output requirements for a specific system **(5 marks)**

(b) (i) Discuss any THREE strategies that may be used during the transition to the new system giving the advantages of each strategy

(ii) What type of changeover strategies would you recommend for a patient Monitoring System and a Secondary School Admission System? **[8 marks]**

(c) Your organization is undergoing a difficult financial experience. You are also aware that there are only two weeks allowed for the changeover process. Furthermore, you have been involved in the development of the new system that by your own experience has no problems. Select a changeover strategy for your organization from the old system to the new system. Explain why you have chosen your changeover strategy. Use a Gantt chart to plan the changeover process. **[7 marks]**

Question 3

(a) (i) Many organizations undertake a feasibility study before taking the decision to commit to full systems development. State FOUR main objectives of such a study.

(ii) Explain why cost-benefit analysis is important in system development **[4 marks]**

(b) Describe the following methods that are used in cost-benefit analysis:

(i) Payback analysis
(ii) Return on investment analysis **[4 marks]**

(c) Assuming a monetary benefits of an information system are KShs 150,000 per year, a one time development cost of KShs. 300,000/=, an operation and maintenance cost of 15,000/= per year, a discount rate of 12% per annum, and a 3-year time horizon:

(a) Fill in the table below
(b) Determine the Net Present Value of the investment
(c) State whether the project is a viable investment. **[6 marks]**

	Year 0	Year 1	Year 2	Year 3	**Totals**
Net Economic Benefit					
Discount rate (0.10 p.a.)					
Present value of Benefits					
Cummulative present value of Benefits					
One time Development cost					
Operation & maintenance					
Discount rate (0.10 p.a.)					
Present value of recurring costs					
Cummulative present value of Costs					

(d) (i) Explain THREE major functions of a project manager
(ii) State and explain TWO project planning tools used by project managers in project management. **[6 marks]**

Question 4

(a) Explain the difference between SDLC and SSADM giving the advantages and disadvantages of each type of technique respectively. **[2 marks]**

(b) Differentiate between the following types of systems giving examples where possible
   (i) Open and closed systems
   (ii) Physical and abstract
   (iii) Deterministic and probabilistic **[6 marks]**

(c) (i) Briefly explain why the study of organizations is important in the design of information systems.

   (ii) Information for decision making can be produced at three basic levels: strategic, tactical and operational. Describe the type of reports required at each level. **[9 marks]**

Question 5

(a) State FOUR advantages of using a database management systems (DBMS) **[4 marks]**

(b) Differentiate between
   (i) Hierarchical and network database models
   (ii) Project planning and project control
   (iii) Program flowchart and system flowchart **[6 marks]**

(c) Explain briefly the following approaches as used in systems analysis and design
   (i) Waterfall approach
   (ii) Object oriented analysis and Design
   (iii) Prototyping **[6 marks]**

(d) List FOUR main causes of project failure

[4 marks]