kasneb

CICT PART II SECTION 3

SYSTEMS ANALYSIS AND DESIGN

WEDNESDAY: 29 November 2017.   Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question.

QUESTION ONE

(a)   Structured systems analysis and design methodology (SSADM) uses three viewpoints when analysing and developing systems. The viewpoints are based on functions, events and data.

Explain the above three viewpoints.   (3 marks)

(b)   (i)   Summarise five-step strategy for event-driven process modelling.   (5 marks)

(ii)   ABC technologies is a company that deals with system design, implementation and system management using models.

With reference to the above statement, describe three types of system models.   (6 marks)

(c)   The objective of "architectural design" is to put a logical structure of the real system in a form that could be interpreted by other people other than the designer.

Explain three parts of architectural design.   (6 marks)
                                                                        (Total: 20 marks)

QUESTION TWO

(a)   A national library uses the following procedures to manage members' details:

- Anyone interested in becoming a member can apply.
- The librarian sends an application form to the applicant.
- The applicant completes the application form and returns it to the librarian.
- The librarian produces a membership card and sends it to the member. The librarian also files the application form in the member's file.
- If a member's details changes, the member informs the librarian who changes the members' details and updates the member's file accordingly.
- If a member resigns from the library, the librarian deletes the member's details and then updates the member's file.

Required:
Draw a level 1 data flow diagram (DFD) to illustrate the above scenario.   (8 marks)

(b)   (i)   Describe three stages you would follow when analysing a system using the soft systems methodology.
                                                                        (3 marks)

(ii)   Summarise three factors that should be considered when deciding whether or not to use a soft systems methodology.   (3 marks)

(c)   Assess the implications of the following mechanical errors common with processes:

(i)   A black hole.   (2 marks)
(ii)   A miracle.   (2 marks)
(iii)   A gray hole.   (2 marks)
                                                                        (Total: 20 marks)

QUESTION THREE

(a)   "Cohesion" is a measure of the functional independence of modules. It expresses how much a module performs a single function without deviating from that function.

   Required:
   Citing an example in each case, distinguish between "coincidental cohesion" and "procedural cohesion".   (4 marks)

(b)   Assess how a root definition aids the analysis of an information system.   (4 marks)

(c)   (i)   Explain the term "requirements engineering" as used in system analysis and design.   (2 marks)

   (ii)   Describe four principal stages in "requirements engineering".   (4 marks)

(d)   Highlight six roles of "traceability" in systems design.   (6 marks)
   (Total: 20 marks)

QUESTION FOUR

(a)   Summarise six ways through which information systems help to improve the decision making process in an organisation.   (6 marks)

(b)   Highlight four types of user experience goals used to evaluate user interface design.   (4 marks)

(c)   Describe three principal characteristics of methodologies based on rapid application development (RAD) techniques.   (6 marks)

(d)   Explain how each of the following characteristics of object oriented systems affect testing:

   (i)   Polymorphism and dynamic binding.   (2 marks)

   (ii)   Inheritance.   (2 marks)
   (Total: 20 marks)

QUESTION FIVE

(a)   There are several trends in automatic data collection (ADC) technology today.

   Summarise five such trends.   (5 marks)

(b)   S – Travels Company Ltd. owns a fleet of taxis which it rents out on an annual basis. Each of its thirty taxis is rented to three drivers for eight hour shifts each for any given day. Each driver pays an annual rental fee. In addition, S – Travels Company Ltd. takes 15% from the drivers' earnings every week. The company is responsible for paying taxes, insurance and maintenance. The taxis are taken to designated garages for repair and all repair and service costs are recorded.

   At the end of each shift, drivers surrender the earnings to the company and if re-fuelling is required an expense claim is made at the end of the shift. The drivers are paid weekly after the necessary deductions are made.

   Required:
   (i)   Produce an activity diagram relating the driver, S – Travels Ltd. office and the garage.   (10 marks)

   (ii)   Develop a sequence diagram for the use case "Arrange a vehicle Repair" with the following description:

      The details of the vehicle to be repaired are entered by the manager. The system responds by displaying a list of all the drivers who are allocated to this vehicle. The manager then enters a description of the fault and the details of the garage. The system then creates the corresponding fault repair record.   (5 marks)
      (Total: 20 marks)

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