

ICT2621

October/November 2017

STRUCTURED SYSTEMS ANALYSIS AND DESIGN

Duration 2 Hours

100 Marks

EXAMINERS

FIRST

SECOND

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Closed book examination

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This paper consists of 15 pages

Instructions

- 1 Answer all the questions
- 2 Answer **BOTH** sections A and B in the answer book. Please **DO NOT** use a mark-reading sheet for any section
- 3 Make sure you have the correct examination paper

[Turn over]

Section A**(Total marks: 40)**

This section consists of 40 multiple-choice questions. In your answer book, in each case, write down the question number and next to it the number representing the correct option, for instance 34. 3

- 1 Busi has been performing at a very high level at a firm, and so when two of her colleagues who are currently leading other development efforts get sick or leave the company, she is asked to step in and help manage these two other efforts

After leaving the first meeting, Busi goes down the hall to meet with the outgoing manager of the second team. In that meeting, he shares with her the latest draft of the systems requirement document, which is nearly complete. In which phase is the second team currently?

- 1 Systems analysis
 - 2 Systems design
 - 3 Systems planning
 - 4 Systems implementation
- 2 A _____ graphically displays one or more business processes, such as handling an airline reservation, filling a product order or updating a customer account
- 1 business matrix model (BMM)
 - 2 business process model (BPM)
 - 3 business indexing model (BIM)
 - 4 business strategic model (BSM)
- 3 Structured analysis is a traditional systems development technique that uses a series of phases, called the _____, to plan, analyse, design, implement and support an information system
- 1 object-oriented (O-O) analysis
 - 2 systems development life cycle (SDLC)
 - 3 transaction processing (TP) system
 - 4 enterprise resource planning system (ERP)

4 A _____ is an overview that describes a company's overall functions, processes, organization, products, services, customers, suppliers, competitors, constraints and future direction

- 1 business matrix
- 2 business profile
- 3 business index
- 4 business glossary

5 Thabo, managing director of an information technology firm, has received a big project from one of their highly valuable clients. However, the project received is different from the usual projects they handle.

Thabo performs certain analyses and ensures that the company's image will not be at risk by taking this project. This is an example of _____

- 1 operational feasibility
- 2 economic feasibility
- 3 technical feasibility
- 4 schedule feasibility

6 A _____ must be achieved to fulfil a company's mission.

- 1 key performance factor
- 2 core competency
- 3 critical success factor
4. vision competency

7 Many companies implement _____ systems that integrate all customer-related events and transactions.

- 1 CRM (Customer relationship management)
- 2 TCO (Total cost of ownership)
- 3 JIT (Just-in-time)
- 4 RFID (Radio frequency identification)

8 _____ are advantages that are difficult to measure in monetary value but are important to a company

- 1 Tangible benefits
- 2 Intangible benefits
- 3 Tactile benefits
4. Real benefits

9 _____ limitations result when a system that was designed for a specific hardware configuration becomes obsolete when new hardware is introduced

- 1 Accessibility
- 2 Relationship
- 3 Feasibility
- 4 Performance

10. Of the measures of feasibility, questions such as "Does management support the project?" and "Will the new system require training for users?" would help predict a system's _____

- 1 schedule feasibility
- 2 technical feasibility
- 3 economic feasibility
- 4 operational feasibility

11 John has just joined a company and in his role as a lead analyst, he will be responsible for determining which systems development method the team uses to create a new application for a major medical supplier

It is a new day at the firm. John has been in place for a few weeks, strengthening the communications skills of his employees, getting them to work much better together. Now, the challenge that he faces is not an internal one, it lies with the client, which is increasingly incapable of sticking with decisions. John, based on his past experience with other clients like this, is afraid that the client may want to make changes late in the game—but that they also will be unwilling to absorb the costs of those changes. For this reason, which of the following methods of development will John eliminate?

- 1 Structured analysis
- 2 Agile/adaptive methods

3 Object-oriented analysis

4 Rapid application development

12 _____ refers to the practical resources needed to develop, purchase, install or operate a system

1 Operational feasibility

2 Technical feasibility

3 Schedule feasibility

4 Market feasibility

13 Which of the following is an example of a discretionary project?

1 Creating a new report for a user

2 Adding a report required by a new law

3 Including annual updates to payroll and tax percentages

4 Updating quarterly changes in reporting requirements for an insurance processing system

14 _____ result from a decrease in expenses, an increase in revenues or both

1 Tangible benefits

2 Intangible benefits

3 Agile benefits

4 Ethical benefits

15 _____ is a systems development technique that tests system concepts and provides an opportunity to examine input, output and user interfaces before final decisions are made

1 Scrum

2 Prototyping

3 Modelling

4 Rapid application development

- 16 _____ technology uses high-frequency radio waves to track physical objects
- 1 Redundant array of independent disks (RAID)
 - 2 Radio frequency identification (RFID)
 - 3 Enterprise resource planning (ERP)
 - 4 Management information system (MIS)
- 17 Structured analysis is called a(n) _____ technique because it focuses on processes that transform data into useful information
- 1 iterative
 - 2 process-centred
 - 3 inferred
 - 4 model-specific
- 18 The term _____ refers to the reasons or justifications for a proposal
1. business case
 - 2 use case
 - 3 work statement
 - 4 problem charter
- 19 In a preliminary investigation report, the _____ section contains a brief description of the system, the name of the person or group performing the investigation, and the name of the person or group who initiated the investigation
- 1 introduction
 - 2 recommendations
 3. expected benefits
 - 4 time and costs estimates

20 The _____ usually begins with a formal request to the IT department, called a systems request, which describes problems or desired changes in an information system or a business process

- 1 systems design phase
- 2 systems planning phase
3. systems support and security phase
- 4 systems analysis phase

21 Janet is providing the junior analysts, in her firm, on the team with some real-world illustrations to explain some of the recommendations that they must be prepared to make to clients based on what they have studied in their coursework in order to solidify their understanding

Which of the following is a reason Janet will share with the new analysts, with regard to a client that wants to purchase a software package?

- 1 The client wants to develop internal resources and capabilities
- 2 The client is looking for the lowest possible costs
- 3 The client has unique business requirements that must be satisfied by this software
- 4 The client has some existing technology in place whose requirements must be met by the new software

22 Which of the following is a reason Janet would offer as a reason for in-house software development?

- 1 The client is looking to spend the least possible time in implementation
- 2 The client wants to be able to use fewer technical development staff
- 3 The client has a number of very distinctive security requirements
- 4 The client wishes to receive future upgrade from the vendors

23 When determining outsourcing fees, a _____ uses a set fee based on a specified level of service and user support

- 1 fixed fee model
- 2 usage model
- 3 subscription model
- 4 transaction model

24 In a(n) _____ structure, which is usually based on interpersonal relationships, some people have more influence or knowledge than appears on an organisation chart

- 1 spontaneous
- 2 unstructured
- 3 informal
- 4 open-ended

25 When software is purchased, a _____ is being bought that gives the purchaser the right to use the software under certain terms and conditions

- 1 fixed fee model
- 2 request for proposal
- 3 software license
- 4 supplemental maintenance agreement

26 The process of concentrating on what is said in an interview and noticing any non-verbal communication that takes place is called _____

- 1 brainstorming
- 2 sampling
- 3 engaged listening
- 4 fact-finding

27 The _____ contains the prerequisites for the new system, describes the alternatives that were considered, and makes a specific recommendation to management

- 1 software requirements specification
- 2 request for quoting document
- 3 software license
- 4 maintenance agreement

28 _____ is a model of software deployment where an application is hosted as a service provided to customers over the Internet

- 1 Hardware as a Help
- 2 Software as a Service
3. Process as a Product
- 4 Process as a Service

29 In the rapid application development (RAD) model, the _____ phase resembles the final tasks in the SDLC implementation phase

- 1 requirements planning
- 2 user design
- 3 construction
- 4 cutover

30 In the context of in-house software development options, a firm that enhances a commercial package by adding custom features and configuring it for a particular industry is called a(n) _____

- 1 business process outsourcing (BPO)
- 2 enterprise resource planner (ERP)
- 3 online service provider (OSP)
4. value-added reseller (VAR)

31 Karabo started the process of selecting a new system for the firm and he is weighing all of the various issues that need to be considered and the resources he has at his disposal as he makes this important decision

Karabo has two candidates for the new system Which one of the following is a strategy he can pursue for making the final selection from among the two candidates?

- 1 For vertical applications, use a demo copy to enter a few sample transactions in both
- 2 Although benchmarking can predict project-specific results, benchmark testing is not a good way to measure relative performance of two or more competing products in a standard environment

3 Be aware that some vendors limit their reference lists to satisfied clients, so mostly negative feedback should be expected from those firms

4 Consult websites maintained by consultants and software publishers with product references and links to vendors

32 A _____ describes the actual processes of entering, verifying and storing data, the physical layout of data files and sorting procedures, the format of reports, and so on

1 logical design

2 physical design

3 quantitative design

4 qualitative design

33 In an interview, _____ encourage spontaneous and unstructured responses

1 open-ended questions

2 closed-ended questions

3 leading questions

4. range-of-response questions

34 When companies use a _____, they already know the specific product or service they want and need to obtain price estimates or bids from vendors

1 request for quotation (RFQ)

2 net present value (NPV)

3 request for proposal (RFP)

4 return on investment (ROI)

35 In the rapid application development (RAD) model, during the _____ phase, users interact with systems analysts and develop models and prototypes that represent all system processes, outputs and inputs

1 requirements planning

2 user design

3 construction

4 cutover

36 To evaluate _____, a systems analyst needs information about projected future volume for all outputs, inputs and processes

- 1 scalability
- 2 reliability
- 3 compatibility
- 4 Applicability

37 Which of the following is a software collection obtained from a vendor or application service provider?

- 1 Software package
- 2 Software cluster
- 3 Software metric
- 4 Software aggregate

38 _____ are important to a systems analyst who must work with people at all organisational levels, balance conflicting needs of users and communicate effectively

- 1 Problem solving skills
- 2 Artistic skills
- 3 Interpersonal skills
- 4 Confrontational skills

39 The _____ phase of the SDLC includes four main activities requirements modelling, data and process modelling, object modelling, and consideration of development strategies

- 1 systems planning
- 2 systems analysis
- 3 systems design
- 4 systems implementation

- 40 The primary advantage of rapid application development (RAD) is that _____
- 1 systems can be developed more quickly with significant cost savings
 - 2 a company's strategic business needs are emphasized and the mechanics of the system are not stressed
 3. the decelerated time cycle allows more time to develop quality, consistency and design standards
 - 4 systems are developed more slowly with fewer bugs

Section B:**(Total marks: 60)****Question 1****[16 marks]**

- 1 1 Briefly describe each of the following symbols used in a data flow diagram (DFD)
- 1 1 1 Process (1)
- 1 1 2 Data flow (1)
- 1 1 3 External entity (1)
- 1 1 4 Data store (1)
- 1 2 Briefly describe the following with respect to DFDs
- 1 2.1 Levelling (2)
- 1 2 2 Balancing (2)
- 1 2 3 Data dictionary (2)
- 1 3 What are the six guidelines for drawing DFDs? (6)

Question 2**[7 marks]**

The most used forms of output technology for business systems is still in form of screen displays and printed matter. List any other seven output types and technologies currently available. (7)

Question 3**[12 marks]**

Scenario In a university registration system, such as that of Unisa, a student can register for one or more subjects, and a subject may have a number of students. A course may be offered to a number of students. A student has to register for one course only at a time. A course consists of a number of subjects and a subject must belong to at least one course.

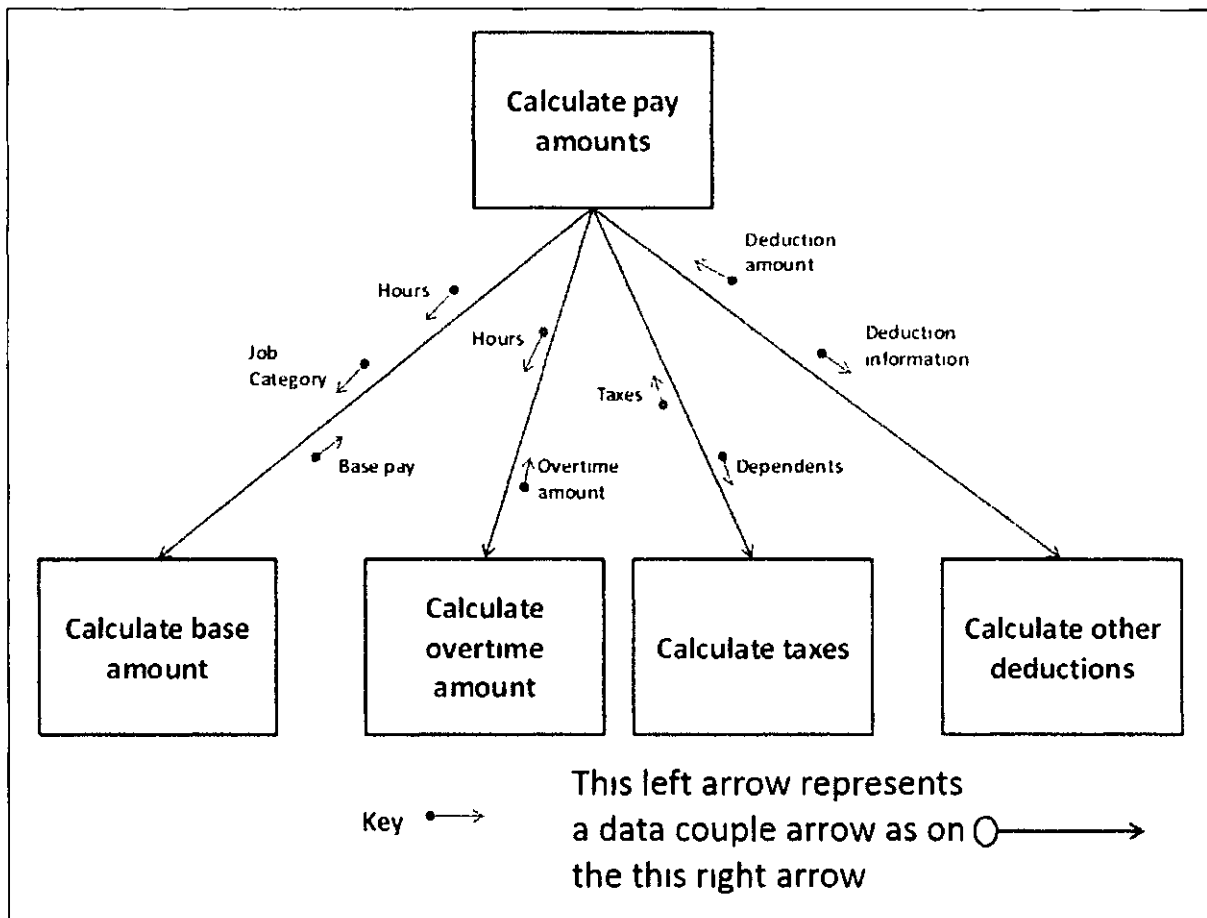
- 3 1 Draw an entity relationship diagram (ERD) for this registration system. The ERD should not contain any many-to-many relationships. No attributes/fields are required in this section. (8)

{ Turn over }

- 3.2 Create a relational database schema from the ERD in 3.1 showing all tables in 3NF. Each table should include at least three fields/attributes. Appropriate primary keys should be used. Primary keys must be underlined and each foreign key should have the letters FK in brackets after it, for instance pqr (FK). (4)

Question 4**[16 marks]**

The following diagram shows a simple structured chart for a Calculate pay amounts module of a payroll system.



- 4.1 Explain in detail how this module works. Your explanation should mention each of the inputs into and outputs from each of the submodules/functions. (9)
- 4.2 Write a formula for the Net pay, using only the variable given in the diagram (i.e. Net pay = _____) (2)

4.3 As an IT trainer of an organisation, list two guidelines or tips that you must keep in mind when developing a training program? (2)

4.4 Briefly describe any three system changeover methods (3)

Question 5

[9 marks]

Briefly describe each of the following with respect to system support and security

5.1 The three components of the CIA triangle (3)

5.2 Adaptive maintenance (2)

5.3 Identity management (2)

5.4 Social engineering (2)