higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

SYSTEM ANALYSIS AND DESIGN
NQF LEVEL 3

8 December 2020

This marking guideline consists of 12 pages.

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SECTION A

QUESTION 1

1.1	1.1.1	A		
	1.1.2	B		
	1.1.3	A		
	1.1.4	A		
	1.1.5	B		
	1.1.6	C		
	1.1.7	A		
	1.1.8	D		
	1.1.9	C		
	1.1.10	A		
			(10 × 1)	(10)
1.2	1.2.1	False		
	1.2.2	True		
	1.2.3	False		
	1.2.4	True		
	1.2.5	True		
	1.2.6	True		
	1.2.7	True		
	1.2.8	True		
	1.2.9	True		
	1.2.10	True		
			(10 × 1)	(10)
1.3	1.3.1	Total cost of ownership		
	1.3.2	Business process automation		
	1.3.3	Accounting information system		
	1.3.4	Business process re-engineering		
	1.3.5	Entity relationship diagram		
	1.3.6	Small or medium enterprise		
	1.3.7	Joint application development		
	1.3.8	Growth share matrix		
	1.3.9	Strengths, weaknesses, opportunities, threats		
	1.3.10	Business process improvement		
			(10 × 1)	(10)

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1.4 1.4.1 D
1.4.2 K
1.4.3 G
1.4.4 H
1.4.5 A
1.4.6 C
1.4.7 J
1.4.8 O
1.4.9 E
1.4.10 B

(10 × 1) (10)
[40]

TOTAL SECTION A: 40

QUESTION 2

2.1 2.1.1 Collection and manipulation of data to produce meaningful information

2.1.2 Integrated management of main business processes, often in real-time and mediated by software and technology

(2 × 2) (4)

2.2
- Input
- Processing
- Output (3)

2.3 Firewall (1)
[8]

QUESTION 3

3.1 ***Top level management***
3.1.1 Long term
3.1.2 Strategical

Middle level management
3.1.3 Medium term
3.1.4 Tactical decision

Lower level management
3.1.5 Short term
3.1.6 Operational decision

(6 × 1) (6)

3.2 3.2.1 A systems analyst is a person who uses analysis and design techniques to solve business problems using information technology

3.2.2 A chief information officer (CIO) is the company executive responsible for the management, implementation, and usability of information and computer technologies.

OR

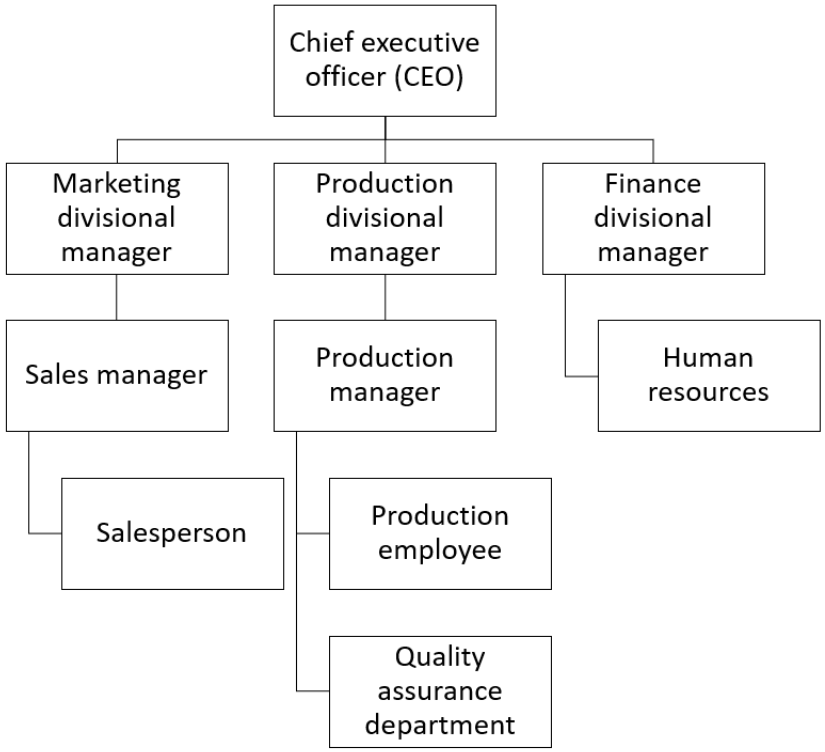
A CIO is responsible for managing an organisation's IT staff, as well as its IT-related assets like software and hardware, and for strategic planning as it relates to computer systems and the organisation's network. (2 × 2) (4)

3.3
- Size and complexity of organisation.
- Nature and complexity of operations
- Source of project
- Size of project
- Ease of integration
- Time frames for implementation
- Budget constraints
- Resource availability
- Technical difficulties (Any 4 × 1) (4)

[14]

QUESTION 4

4.1 Organisational chart



1 mark per correct entity = 8
Subtract 1 for every incorrect subordinate

4.2 4.2.1 Project evaluation and review technique (1)

4.2.2
- To schedule events and activities to optimise time
- To allow managers to evaluate time and resources necessary to manage a project (2 × 1) (2)

4.2.3 Task E (1)

4.2.4 A, B and C (1)

4.2.5
A → C → D → G 2 + 1 + 2 + 4 = 9
A → B → D → G 2 + 3 + 2 + 4 = 10
A → B → E → F → G 2 + 3 + 5 + 2 + 4 = 16 (** Critical Path)
(3 × 2) (6)

4.2.6 A → B → E → F → G (1)
[20]

QUESTION 5

5.1
Phase 1: Requirements specification
Phase 2: Design
Phase 3: Implementation (Coding)
Phase 4: Testing (Validation) and debugging
Phase 5: Integration (Installation and maintenance) (5)

5.2 5.2.1 Process of developing a working replication of a product or system that has to be engineered
OR
Small-scale model of end product and used for obtaining customer feedback (2)

5.2.2 Software development life cycle (1)

5.2.3
- Design methodology based on cyclic process of prototyping, testing, analysing and refining a product or process
- Changes and refinements are made based on results of testing most recent iteration of design
- Process intended for ultimate improvement of quality and functionality of design (3)

5.2.4 2C (1)

5.2.5 Client helps decide whether prototype needs further refinement (1)

5.2.6
- Users actively involved in development
- Better understanding of system being developed as working model is provided
- Errors detected much earlier
- Quicker available user feedback leading to better solutions
- Missing functionality easily identified
- Confusing or difficult functions can be identified
- New requirements easily accommodated because of scope for refinement
- Developed prototype can be reused by developer for more complicated future projects
- Design flexibility (Any 4 × 1) (4)

5.3
- Stating what an organisation wants to achieve and giving clear guidance about decision making.
- Statement defining the organisation and critical processes together with desired levels of performance. (2 + 2) (4)

[21]

QUESTION 6

6.1
- Technical Feasibility
  This assessment focuses on the technical resources available to the organisation that includes the hardware and software and other technical requirements

- Economic Feasibility
  This assessment typically involves a cost/ benefits analysis of the project, helping organizations determine the viability, cost, and benefits associated with a project before financial resources are allocated.

- Legal Feasibility
  This assessment investigates whether any aspect of the proposed project conflicts with any legal requirements.

- Operational Feasibility
  This assessment involves undertaking a study to analyse and determine whether and how well the organization's needs can be met by completing the project.

- Scheduling Feasibility
  This assessment is the most important for project success; after all, a project will fail if not completed on time. In scheduling feasibility, an organization estimates how much time the project will take to complete.

(Any 3 × 2) (6)

6.2
- Identify a set of candidate solutions.
- Analyse the candidate solutions.
- Compare the candidate solutions.
- Recommend a candidate solution. (4)

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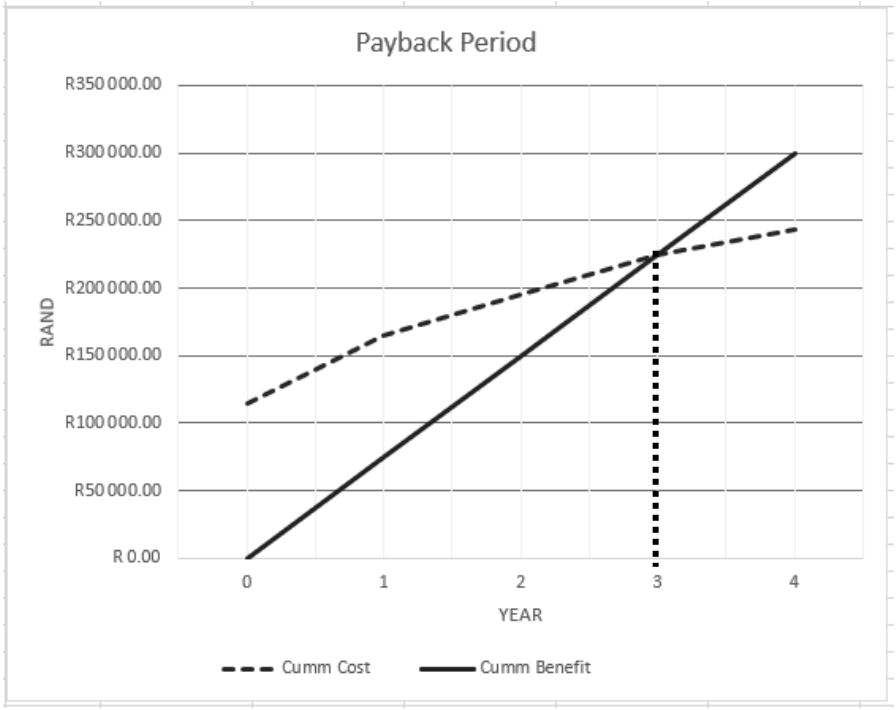
6.3 6.3.1 ROI = $\frac{\text{(Total benefit) – (Total cost)}}{\text{(Total Cost)}} \times 100$

ROI = $\frac{\text{(300 000) – (243 000)}}{\text{(243 000)}} \times 100$

ROI = 23%

1 mark – Formula
2 marks for substitution
1 mark for final answer rounded and presented as percentage (4)

6.3.2



Payback period = 36 months (accept a deviation of +/- 2 months) (2)

6.3.3 NPV = (Total present value of discounted benefits) – (Total present value of discounted costs)
= R227850 – R216368
= R11 482

1 mark for formula
1 mark for the substitution
1 mark for NPV expressed as rand value (3)
[19]

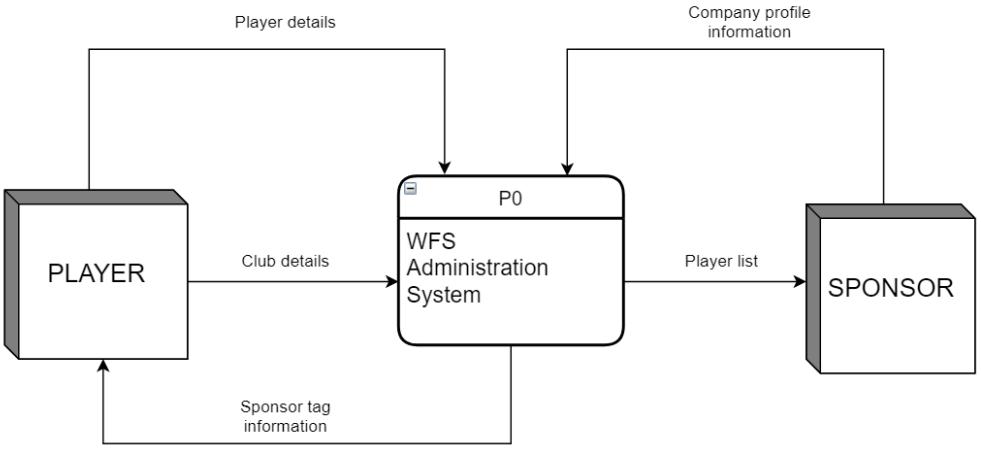
QUESTION 7

7.1 7.1.1 Object in system to be modelled and about which information must be stored

7.1.2 Characteristic of entity

(2 × 2) (4)

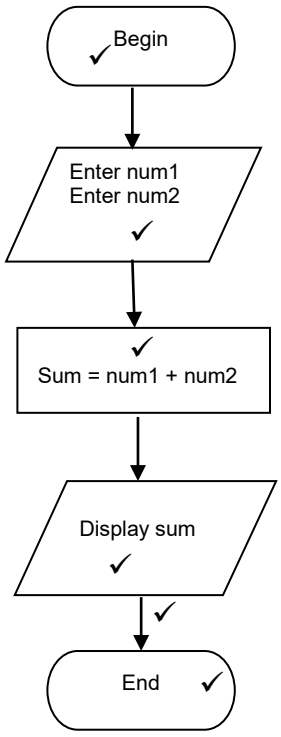
7.2



Mark allocation

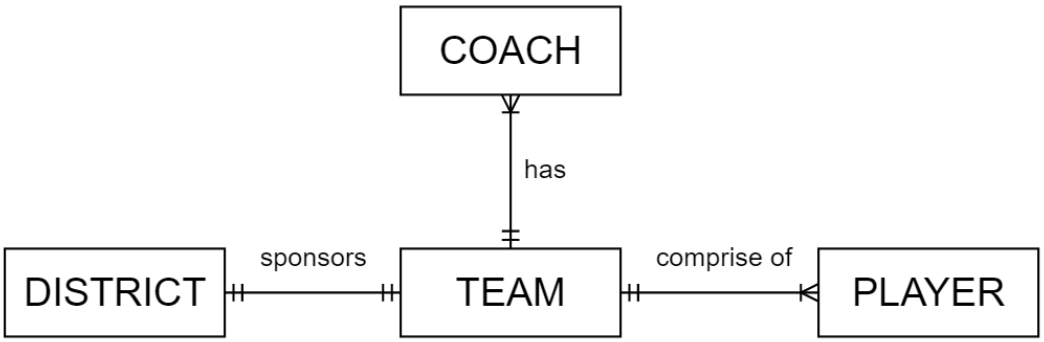
1 mark for indicating P0 (1 × 1)
1 mark for indicating main process (system) with correct symbol (1 × 1)
1 mark for each entity correctly indicated (2 × 1)
1 mark for each dataflow (with information described) and direction of flow correctly indicated (5 × 1) (9)

7.3



1 mark per correct symbol used = 5
1 mark for all correct flow indication = 1 (6)

7.4



Only allocate marks if ERD has been developed using crow's foot symbols

Mark allocation

1 mark for each entity correctly indicated using crow's foot notation (4 × 1)
1 mark for each connectivity correctly indicated using crow's foot notation (3 × 1)
1 mark for each relationship correctly indicated (3 × 1) (10)
[29]

QUESTION 8

8.1 8.1.1 Process to transform complex object, concept or process into simplified version

8.1.2 Entity Relationship Model (ER Modelling) is a graphical approach to database design. It is a high-level data model that defines data elements and their relationship for a specified software system.

8.1.3 Occurs externally to system in system environment and is usually initiated by an actor

(3 × 2) (6)

8.2
- External events – occur externally to system but in system environment
- Temporary events – occur internally to system and are triggered by time
- State events – occur internally to system and are triggered by changes in state due to another event (3 × 2) (6)

8.3
- Enhances understanding of system
- Promotes efficient communication of system details among team members
- Provides point of reference for system designers to gather system specification
- Documents system for reference (4)

[16]

QUESTION 9

9.1 9.1.1 Process of ensuring data has undergone cleansing to ensure quality so that it is correct and useful

9.1.2 Set of formally described tables from which data can be accessed or reassembled in different ways without having to reorganise database tables

9.1.3 Column or group of columns in relational database table that provides a link between data in two tables. A FK is often a PK in another table.

(3 × 2) (6)

9.2 9.2.1 3 (1)

9.2.2 3 (1)

9.2.3 Each checkbox operates individually, so a user can toggle each response 'on' and 'off'. User is able to select more than one extra toping using checkboxes

Radio buttons allow only one selection (one option), either a thin base or a thick base or one applicable size for the pizza (2 × 2) (4)

9.2.4 List box/Rich textbox (Also accept label) (1)

9.2.5 Presents user with selection for flavour of pizza (1)

9.2.6 NumericUpDown (1)

9.2.7 Textbox (1)

9.2.8
- Place users in control interface.
- Make it easy to interact with product.
- Reduce cognitive load.
- Make user interfaces consistent.
- Keep interface simple.
- Create consistency and use common UI elements.
- Be purposeful in layout.
- Use colour and texture strategically.
- Ensure that system communicates to user in relation to what's happening.
- Think about the defaults. (Any 5 × 1) (5)

[21]

QUESTION 10

10.1
- Define requirements
- Research available technology meeting these requirements
- Issue request for proposals (RFPs) to shortlisted vendors
- Compare available technology
- Decide on best option

OR

- Specify IS technology requirements
- Create and issue RFP or RFQ
- Conduct preliminary evaluation of proposals and shortlist vendors
- Conduct detailed evaluation of shortlisted proposals
- Award contract to best overall proposal
- Implement IS technology (Any 5 × 1) (5)

10.2
- Initial purchasing and implementation
- Company capital availability (2)

10.3
- Physical space
- Ergonomics
- Security
- Power
- Network connectivity (5)

[12]

TOTAL SECTION B: 160
GRAND TOTAL: 200

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