



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

**MECHATRONIC SYSTEMS
NQF LEVEL 4**

22 November 2024

This marking guideline consists of 7 pages.

QUESTION 1

- 1.1 1.1.1 Project management is the application of knowledge, experience and skills to meet the project objectives.✓✓ (1 × 2)

OR

Project management is the application of processes, methods, skills, knowledge and experience to achieve specific project objectives according to the project acceptance criteria within agreed parameters.✓✓

(2)

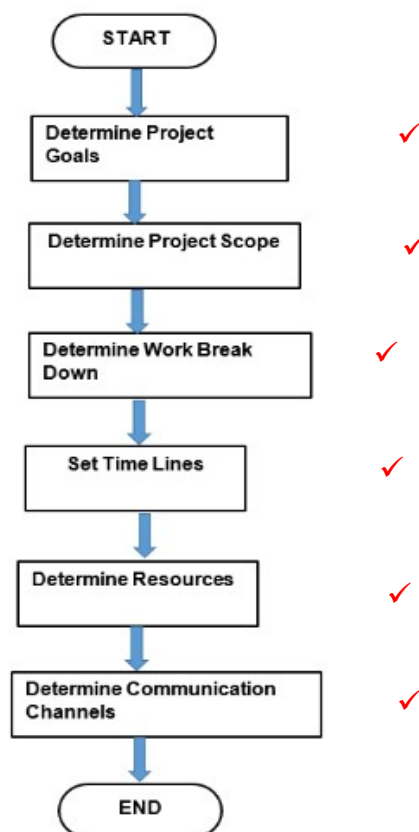
- 1.1.2 Project planning is the selection of a systematic method/process by which a product is to be manufactured economically.✓✓ (1 × 2)

OR

Project planning is a discipline addressing how to complete a project in a certain timeframe, usually with defined stages and designated resources.✓✓

(2)

1.2



(6 × 1)

(6)

[10]

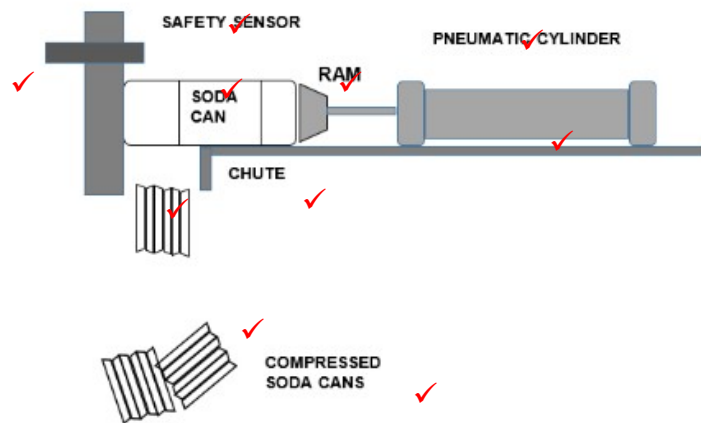
QUESTION 2

- 2.1 A design brief is a short description of up to two or three lines stating what is required without too much technical jargon. ✓✓

Whereas

A design specification is a detailed document which sets out the product process exactly. ✓✓ (2 × 2) (4)

2.2

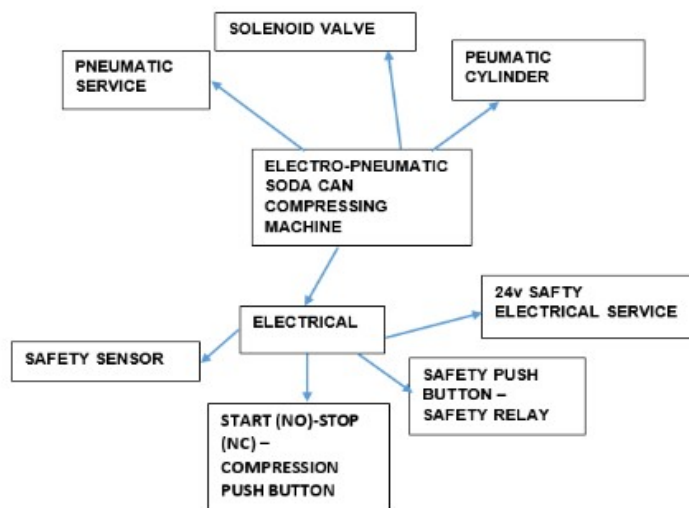


(marker to use discretion) (10 × 1) (10)

- 2.3
- Magazines
 - Catalogues
 - Library
 - Internet
 - TV
 - Technical manuals
 - Engineering firms

(Other related projects) (Any relevant SIX) ✓✓✓✓✓✓ (6 × 1) (6)

2.4



Any relevant correct component ✓✓✓✓✓ (5 × 1) (5)
[25]

QUESTION 3

- 3.1
- Sequence chart✓
 - Time chart✓
 - Flow chart✓
- (3)

- 3.2 An evaluation list is made up so that various operational tests can be carried out to ensure that the project meets specifications.✓✓ (1 × 2) (2)

- 3.3 Once all the planning has been completed and meets approval, the project must be executed (put into action/actioned).✓✓ (1 × 2) (2)

- 3.4 A flow chart shows the sequence of events as they are to be carried out/executed.✓✓

Whereas

The time chart also has the sequence of events with time allocation.✓✓ (2 × 2) (4)

3.5

✓ ✓ ✓ ✓

TASK	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7
DESIGN							
PROCURE							
MANUFACTURE							
ASSEMBLY							
CHECK							
TEST & HANDOVER							

NOTE: 3 MARKS ALLOCATED FOR THE 7 WEEKS

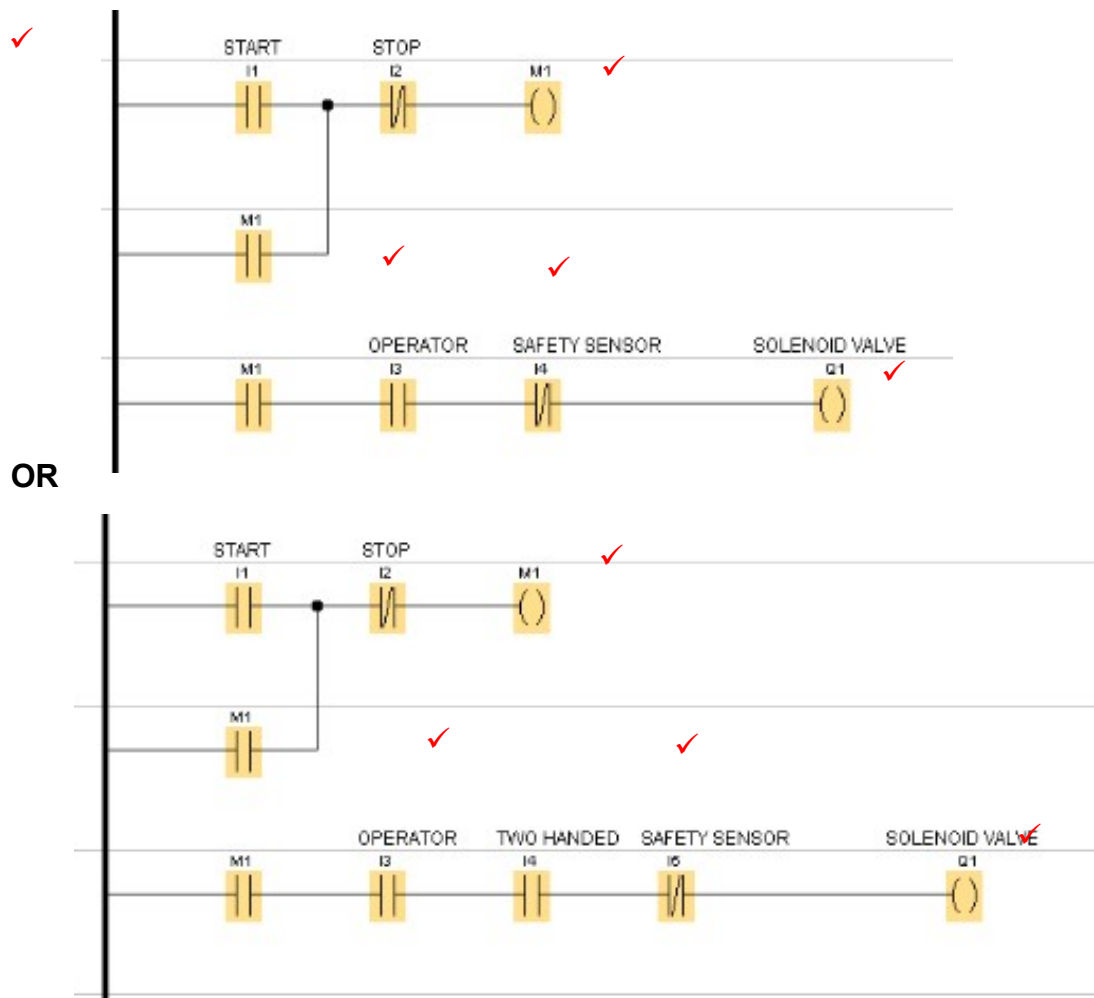
(11 × 1) (11)

- 3.6 *Integrate* refers to the fact that various sub-systems can be put together to work together.✓✓

Whereas

Interface refers to integrated sub-systems using different protocols that can communicate with each other using software/hardware interface modules.✓✓ (2 × 2) (4)

3.7



(4 × 1)

(4)
[30]**QUESTION 4**

- 4.1 Electrical services ✓
Air service ✓
Sensors ✓

(3 × 1)

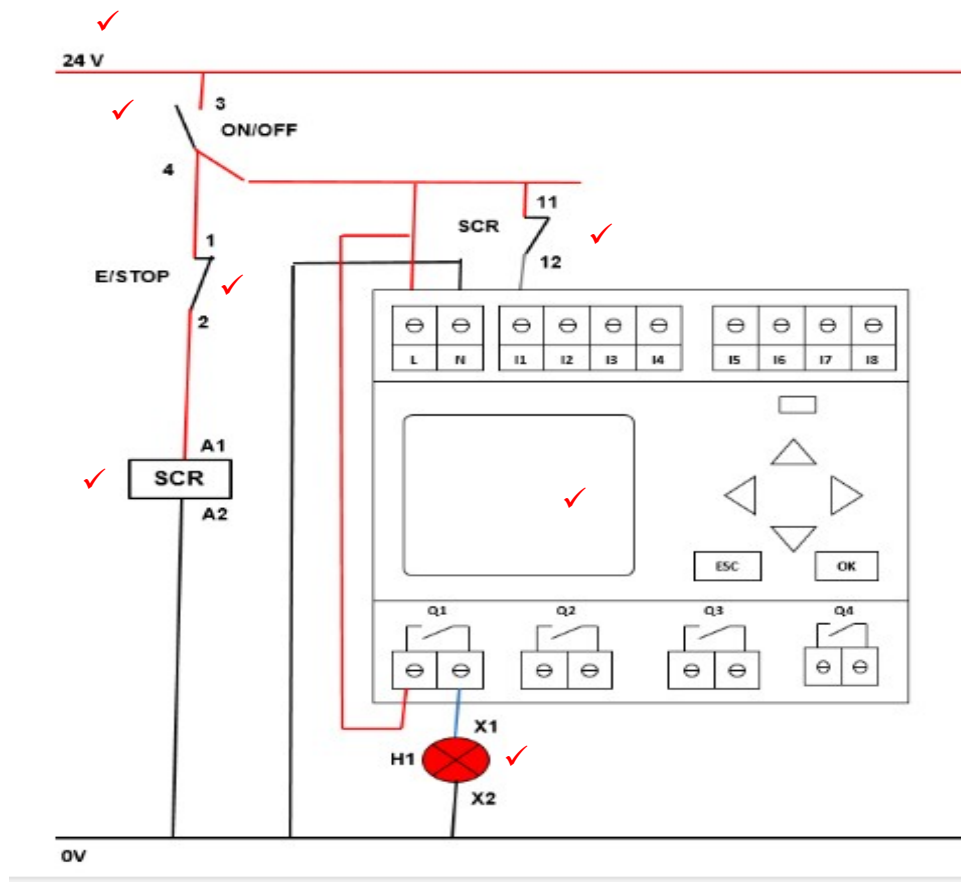
(3)

- 4.2
- Status of the system
 - Detect the workpiece
 - Safety sensor
 - Two-handed start

(Any correct TWO)

(2)

4.3

(10 × 1) (10)
[15]**QUESTION 5**

- 5.1
- The engineering drawings
 - The electro-pneumatic connection diagram
 - The PLC connection/wiring diagram
 - The hard copy of the PLC source code
 - The soft copy of the PLC source code
 - The I/O address allocation
 - The servicing/maintenance instructions
 - The operating instructions
- Any relevant SIX correct ✓✓✓✓✓✓ (6 × 1) (6)
- 5.2 The technical manual is to assist the maintenance person to understand, troubleshoot and repair the mechatronic application. ✓✓ (1 × 2) (2)

5.3	<i>Fatigue</i> is when a material loses its toughness due to age.✓✓ <i>Wear</i> is when the material loses its tolerance due friction over time.✓✓	(2 × 2)	(4)
5.4	• E/Stop✓✓ • Sensor for hand safety✓✓ • Safety control voltage (24V)✓✓ • Low air pressure (8 bar)✓✓	(4 × 2)	(8)
			[20]
TOTAL:			100