higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING PROCESSES
NQF LEVEL 4

(6021004)

8 March 2018 (Y-Paper)
13:00–16:00

This question paper consists of 6 pages.

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TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Write neatly and legibly.

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QUESTION 1

1.1 Choose a description from COLUMN B that matches a word/phrase in COLUMN A. Write only the letter (A–K) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1.1	Quality assurance	A	to protect fellow workers from ultraviolet light rays.
1.1.2	Warranties and guarantees	B	for free flow of air in the workplace.
1.1.3	Fit and suitability	C	are special piece of cloth that are fastened with buttons around the top of the shoes.
1.1.4	Pirate parts	D	by ordering genuine part you know the standards to which it was manufactured
1.1.5	Ventilation		
1.1.6	Screen for welding	E	separates one thing from another thing.
1.1.7	Spats	F	many manufactures will not honor it if pirate parts are used.
1.1.8	Isolates	G	showing the main parts of something in a sample way.
1.1.9	Service manual		
1.1.10	Schematic	H	parts not approved by the original manufacture of the components.
		I	a genuine part will fit the machine without modification.
		J	a book that tells you everything you need to know about a component.
		K	machines are not operating and no production takes place

(10 x 1) (10)

1.2 Warning signs and safety signs play an important role in the workplace.

List FIVE important pieces of information warning signs and safety signs must display. (5)

1.3 Give TWO reasons why parts specified by the manufacturer should be used. (2)

1.4 Information plates or tags are attached to a component for future service reference.

List THREE important pieces of information that plates or tags should have. (3)

[20]

QUESTION 2

2.1 A record must be kept of any component that has been replaced.

State THREE reasons for keeping records when replacing components. (3)

2.2 Name TWO methods of marking components for identification. (2)

2.3 Give THREE reasons why it is very important to check replacement parts carefully before placing it into the component or machine. (3)

2.4 Name FOUR methods of cleaning either a component or a machine. (4)

2.5 List FIVE signs or warnings that must be observed during the final inspection of assembled equipment or components. (5)

2.6 State THREE ways in which tolerances of machine components can be checked. (3)

[20]

QUESTION 3

3.1 Workers and students using machines and power tools are faced with potential risk of injury due to fast-moving machine parts.

State FOUR safety precautions to observe while operating milling machines. (4)

3.2 Lubrication of cutting tools is very important to reduce friction, rust, wear and to increase tool life span.

Explain FOUR methods of applying lubricants to cutting tools. (4)

3.3 Name FOUR types of lubrication or cutting fluids. (4)

3.4 Explain the difference between the band saw and the power hacksaw regarding the cutting operation. (4)

3.5 Discuss the advantages of a band saw (4)

[20]

QUESTION 4

4.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (4.1.1– 4.1.5) in the ANSWER BOOK.

4.1.1 Power saws are used to cut …

A round material and bars.
B sheet metal, thin bars and rods.
C sheet metal, thick bars and rods.
D sheet metal using gas.

4.1.2 For mass production you use …

A oxyacetylene cutting.
B cold saws
C band saws
D profile machines

4.1.3 Plasma cutting is high in …

A velocity.
B oxidizes.
C cutting fluid.
D cutting gas.

4.1.4 It guides the blade as it moves:

A Idler wheels
B Idler pulley
C Pitch
D Rregulator

4.1.5 Light implication by simulator emission of radiation:

A Pitch
B Ions
C Flux
D Laser

(5 × 1) (5)

4.2 Oxyacetylene cutting uses a combination of two gasses to make the cut.

List the FIVE steps to follow when setting up the equipment for oxyacetylene cutting? (5)

4.3 As part of your ISAT, you are required to manufacture a component using the computer-aided machine process. You have selected a program that is compatible with the machine.

Illustrate by means of a flowchart the SIX steps to manufacture the component. (6)

4.4 Name FOUR important site rules regarding safety that apply to workers and machinery in industry. (4)

[20]

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QUESTION 5

5.1 Name THREE axes that are on computer-aided machines. (3)

5.2 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (5.2.1–5.2.2) in the ANSWER BOOK.

5.2.1 T-code is the tool that informs the controller what type of motion or action to command. (1)

5.2.2 S-code is the tool that determines the spindle speed for the program. (1)

5.3 What does the abbreviation CAM stand for in engineering terms? (1)

5.4 Explain the problems that can occur when materials that needs to be joined is not cleaned properly. (2)

5.5 Rivets are used when joining thin materials.

Name FOUR types of rivets. (4)

5.6 When deciding on a suitable method for joining, you need to consider the function of the component and the environment under which the product will operate.

List FOUR important factors to consider when selecting a joining method. (4)

5.7 Name FOUR pieces of equipment needed for shielded metal arc welding. (4)

[20]

TOTAL: 100

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