higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING PROCESSES
NQF LEVEL 4

(6021004)

19 November 2018 (Y-Paper)
13:00–16:00

This question paper consists of 7 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 State SIX safety factors in the workplace that you should observe before you start to work on your ISAT. (6)

1.2 Explain the following joining methods that you use in your workshop:

1.2.1 Nut and bolt

1.2.2 Welding

1.2.3 Riveting

1.2.4 Brazing

1.2.5 Soldering (5 × 2) (10)

1.3 Explain the following processes:

1.3.1 The tempering process.

1.3.2 The process to infuse metal properties. (2 × 2) (4)

[20]

QUESTION 2

2.1 There are certain steps that you need to follow when dismantling and cleaning components.

State FOUR steps in the correct sequence that can be used in the workplace. (4)

2.2 When dismantling components, you as an artisan must check for signs of wear or damage.

Prepare a checklist of FOUR types of wear that you must examine before you replace parts. (4)

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2.3 Choose a description from COLUMN B that matches a term in COLUMN A. Write only the letter (A–H) next to the question number (2.3.1–2.3.7) in your ANSWER BOOK.

COLUMN A		COLUMN B	
2.3.1	Metallic projection	A	pieces of non-metallic material that are in the mould and become part of the cast when it solidifies
2.3.2	Cavities in the cast	B	cracks or tears in the cast
2.3.3	Discontinuities	C	pieces of metal that stick out from the cast which means that the cast is not smooth
2.3.4	Defective surfaces	D	it occurs when the metal does not shrink properly when the cast sets or it is the wrong size or it is warped or bent
2.3.5	Incomplete casting	E	tiny, rough or smooth holes that are on either on the surface of the cast or inside the cast
2.3.6	Incorrect dimension or shape	F	it happens when too little material is used when the metal is poured into the mould
2.3.7	Inclusions	G	surfaces that have folds or scars or sand stuck to them
		H	the degree to which material can resist scratching

(7 × 1) (7)

2.4 State TWO important reasons for keeping records when replacing components. (2)

2.5 When replacing components there are certain steps that need to be followed to eliminate mistakes and problems.

State THREE steps that you will follow during the assembling process. (3)

[20]

QUESTION 3

3.1 Various types of cutting tools are used for specific jobs.

3.1.1 List any FIVE type of cutting tools used in the workshop. (5)

3.1.2 Explain the use of each of the tools mentioned in question 3.1.1 (5)

3.2 Differentiate between the function of the following:

3.2.1 Chuck in a lathe

3.2.2 Chuck in a milling machine (2 × 2) (4)

3.3 Various types of machining processes are carried out in the workshop.

Explain the following types of machining process:

3.3.1 Milling

3.3.2 Turning

3.3.3 Sawing (3 × 2) (6)

[20]

QUESTION 4

4.1 You are given a task to cut a work piece in the workshop.

4.1.1 State FOUR aspects to consider when selecting the correct cutting equipment. (4)

4.1.2 Before you can start cutting, you need to prepare the cutting equipment by setting the correct cutting speed.

(a) Define the term "*cutting speed"* (2)

(b) State the unit of the measurement for cutting speed. (1)

4.1.3 After selecting a power cutting tool to perform a task, you need to choose the correct cutting fluid according to the manufacturers specifications.

Explain the importance for using cutting correct fluid during the cutting process. (4)

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4.2 FIGURE 1 below shows the front panel of a band saw machine.

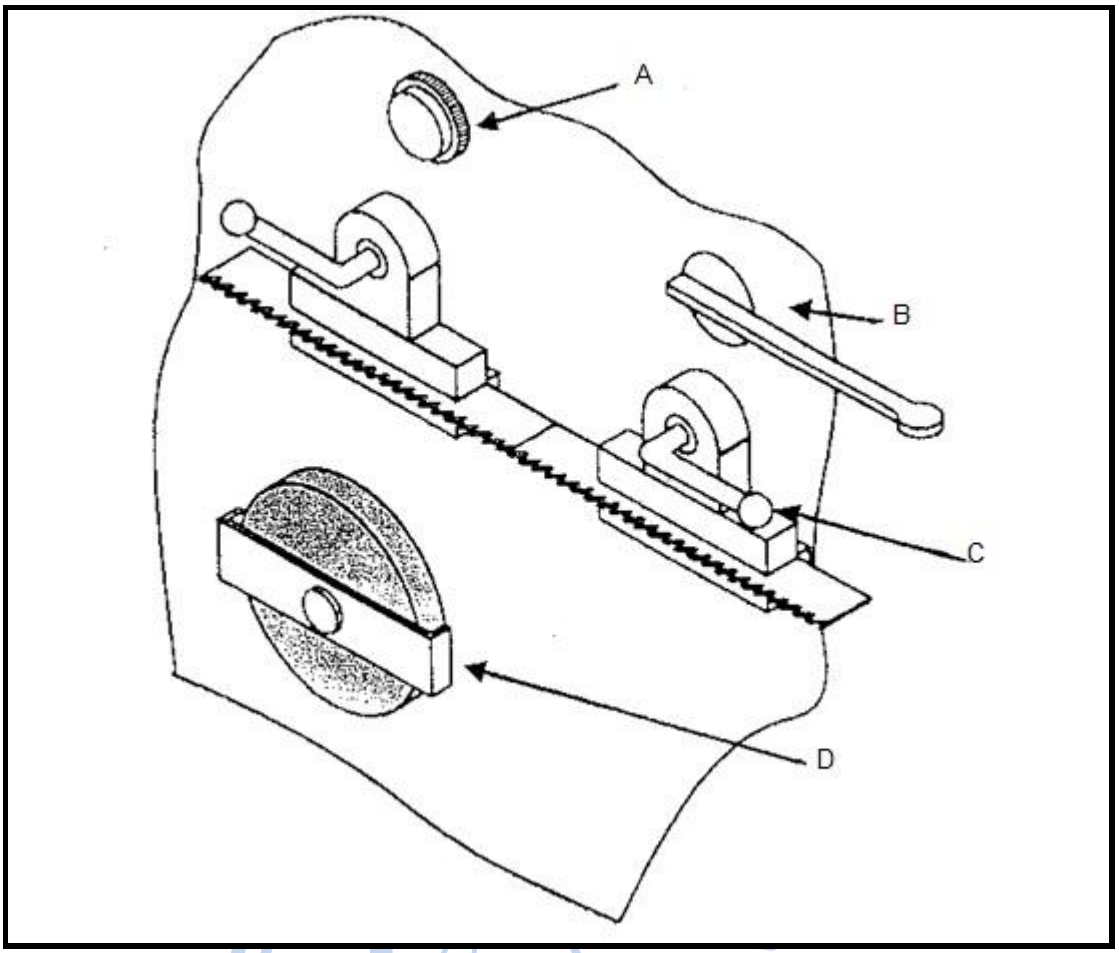


FIGURE 1

4.2.1 Label the parts (A–D) in the ANSWER BOOK. (4)

4.2.2 State the function of D of the above front panel on the band saw machine. (1)

4.3 Differentiate between the following reports.

4.3.1 Non-conformance report (2)

4.3.2 Occupational Health and Safety report (2)

[20]

QUESTION 5

5.1 As a technician you are required to test the assembled components and record your findings in the form of a report.

State SIX aspects that you must analyse when formulating your report. (6)

5.2 Cutting fluid can be applied in various ways depending on the equipment available for lubrication.

State any TWO methods that are used in industry. (2)

5.3 Once the program is entered into the CNC machine, it can be simulated to check if there are errors.

Explain THREE specific aspects that must be observed during the simulation process. (6)

5.4 You are given a drawing of the work piece to be cut with a power saw.

Briefly explain step by step how you would set up the power saw to cut the work piece accurately according to the dimensions on the drawing. (6)

[20]

TOTAL: 100

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