higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING PROCESSES
NQF LEVEL 4

(6021004)

14 November 2022 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

271Q1N2214

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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. Start each question on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.

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QUESTION 1

State SIX pieces of relevant information that an artisan must report to the customer after completing a job. **[6]**

QUESTION 2

2.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.1.1–2.1.5) in the ANSWER BOOK.

2.1.1 When welding is done in a workshop, a special air extractor should be installed above each welding bay.

2.1.2 Paraffin is the only solvent recommended for cleaning dismantled components.

2.1.3 Once components start making noise it will never function properly and it needs to be replaced with immediate effect.

2.1.4 A workshop floor should always be dry and free of oil and grease as these substances make the floor slippery.

2.1.5 When planning workshop layout, make sure that there will be enough space for free and easy movement between the workbenches and machinery.

(5 × 1) (5)

2.2 State which method can be used to clean components made of asbestos material (1)

2.3 State TWO reasons that can cause the cylinder head of an engine to become warped. (2)

2.4 List TWO negative effects that vibration can have on nuts and bolts during the operation of a machine. (2)

2.5 Explain the meaning of each of the following terms used in engineering:

2.5.1 Structural defects

2.5.2 Design errors

2.5.3 Friction

2.5.4 Scrutinising

2.5.5 Vibration

(5 × 1) (5)

2.6 Explain what needs to be done if a component is functioning properly but still makes abnormal noise after it was tested. (2)

2.7 State TWO negative effects that heavy loads can have on a cast. (2)

2.8 State SEVEN reasons that might cause vibration on an assembly during operation. (7)
[26]

QUESTION 3

3.1 State FIVE general safety principles for workshops that a machine operator should follow when preparing to operate engineering machines. (5)

3.2 List the TWO settings that can be done on a machine to suit the type of materials, its dimension and the finishing required for a particular job. (2)

3.3 Explain how to examine material consumption and replace timeously when cutting components on a machine. (2 × 2) (4)
[11]

QUESTION 4

4.1 Which metal cutting saw has a circular blade? (1)

4.2 Apart from the cutting method in QUESTION 4.1, name FIVE other cutting methods that can be used to cut different metals in an engineering workshop. (5)

4.3 Name TWO lubricating methods used on a band saw during operation. (2)

4.4 Give SIX reasons why a machine operator must select the correct cutting fluid when cutting a workpiece in a workshop. (6)

4.5 Explain how to prepare cutting equipment before cutting materials. (4)

4.6 Explain the function of each of the following controls on a cutting machine:

4.6.1 Job selector

4.6.2 Control valve

(2 × 2) (4)

4.7 State FOUR general guidelines that an operator must follow when setting up cutting machines. (4)
[26]

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QUESTION 5

5.1	What is the function of the input display panel on a post-processor?	(2)
5.2	List FOUR examples of processes an operator must consider when choosing the sequence for machining operations.	(4)
5.3	State the FOUR reasons why it is important to simulate the program on a Computer Aided Machines (CAM) before manufacturing a part.	(4)
5.4	Explain the meaning of the axes x, y and z on a CAM with a vertical spindle.	(3)
5.5	Explain the meaning of the axes x, y and z on a CAM with a horizontal spindle.	(3)
		[16]

QUESTION 6

6.1	Give TWO important reasons for checking a joint on a job to ensure that it is to the customer's satisfaction. (2 × 2)	(4)
6.2	State FIVE checks to be conducted when examining joined material in a workshop.	(5)
6.3	Explain how to test for leaks on the pipes of the oxyacetylene set.	(2)
6.4	Explain the importance of checking each of the following to make sure that the workplace is safe for the employees:	
6.4.1	Proper ventilation	
6.4.2	Correct functioning of lifting equipment (2 x 2)	(4)
		[15]
	TOTAL:	**100**

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