higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING PROCESSES
NQF LEVEL 4

(6021004)

1 December 2020 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

147Q1N2001

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TIME: 3 HOURS
MARKS: 100

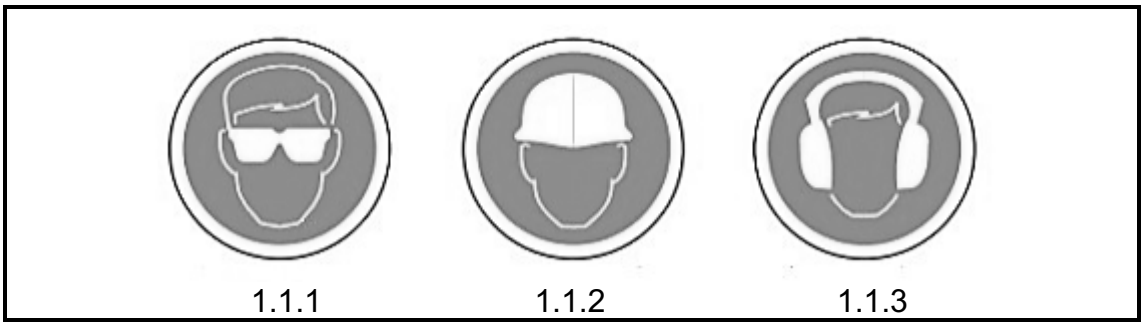
INSTRUCTIONS AND INFORMATION

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

1.1 Explain the meaning of each of the following signs by writing only the answer next to the question number (1.1.1–1.1.3) in the ANSWER BOOK.



1.1.1 1.1.2 1.1.3

(3 × 1) (3)

1.2 List THREE housekeeping rules you need to follow when cleaning the workshop after completing your ISAT. (3)

[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 (2.1.1–2.1.6) in the ANSWER BOOK.

2.1.1 Misalignment between the motor and shaft causes bearing failure.

2.1.2 Fluid that leaks under pressure can damage the sealing surface in the pump.

2.1.3 Oil leaks can cause belt misalignment.

2.1.4 Sometimes a component functions properly even when making unusual noises.

2.1.5 Correct belt and chain tensions are the reasons for sprocket and belt failure.

2.1.6 Signs of lubrication failure include discolouration of parts and excessive play on bearing housing.

(6 × 1) (6)

2.2 State FOUR aspects to consider before selecting correct solvents. (4 × 2) (8)

2.3 List FIVE defects that lead to components not meeting the required standards. (5)

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2.4 List FOUR important aspects to remember before operating a machine to start a job. (4)

2.5 Briefly explain how to check for overheating on a machine before repairs can be done. (3)
[26]

QUESTION 3

3.1 State FIVE safety precautions to consider when operating machinery (5)

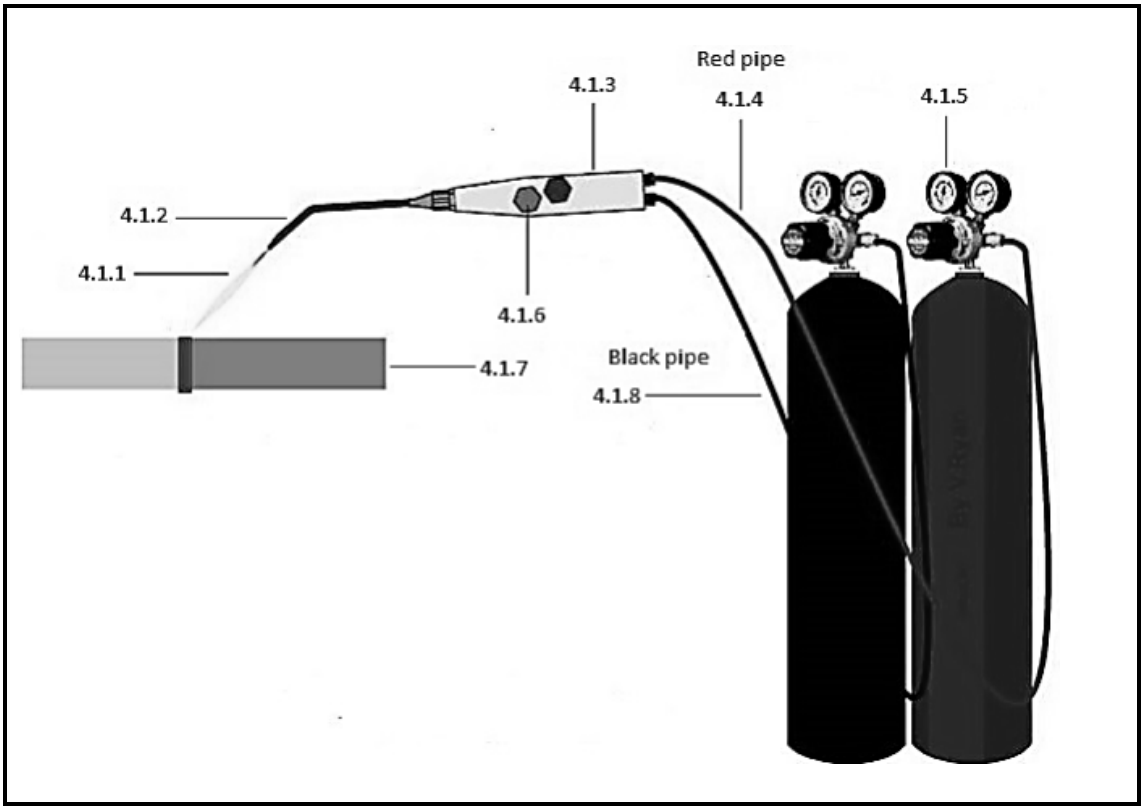
3.2 Name THREE types of fixed gauges that can be used when checking the tolerance of machined components. (3)

3.3 Explain how to ensure that waste materials don't get mix with other materials. (2)

3.4 Describe what a *chuck* is. (1)
[11]

QUESTION 4

4.1 The figure below shows how oxy - acetylene can be used to join two metals.



Label the parts by writing only the answer next to the question number (4.1.1–4.1.8) in the ANSWER BOOK. (8 × 1) (8)

4.2 State the function of the part numbered 4.1.5 on the sketch. (1)

4.3 List FIVE types of steel used in a fitting workshop. (5)

4.4 List FIVE important inspections to be checked on a part after it was manufactured. (5)

4.5 Explain, step by step, how the mist-coolant systems in band saws to operate work to cool the work piece and the band. (8)
[27]

QUESTION 5

5.1 Explain, step by step, how to simulate the program for a machine. (4 × 2) (8)

5.2 Explain how to measure, record quality and check the design of a part to ensure it meets specified requirements. (4 × 2) (8)

5.3 What does *simulation* mean? (1)
[17]

QUESTION 6

6.1 Name TWO types of arc welding used in industries. (2)

6.2 Differentiate between *gas welding* and *braze welding*. (2)

6.3 Explain how to join thin metals by making use of the soldering method. (3 × 2) (6)

6.4 Name the THREE tools required to join metals by making use of the rivet method. (3)
[13]

TOTAL: 100

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