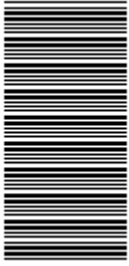


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**higher education  
& training**

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL CERTIFICATE (VOCATIONAL)**

**MANUAL MANUFACTURING  
NQF LEVEL 2**

**NOVEMBER EXAMINATION**

(6030092)

**24 November 2015 (X-Paper)  
09:00–12:00**

**This question paper consists of 6 pages.**

**TIME: 3 HOURS**  
**MARKS: 100**

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**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 Name FOUR methods to control hazards in the workplace. (4)
- 1.2 Name FIVE basic safety rules in the workplace. (5)
- 1.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (1.3.1–1.3.5) in the ANSWER BOOK.
- 1.3.1 In the interests of your own safety, always wear surgical gloves when dealing with an injury or a bleeding person.
- 1.3.2 The purpose of the Occupational Health and Safety Act is to promote the health, safety and wellbeing of unionized workers.
- 1.3.3 Moving machine parts have the potential for causing severe workplace injuries.
- 1.3.4 Machine guarding is not vital to every workshop when using machinery.
- 1.3.5 The most popular form of energy used by humans is electricity. (5 x 1) (5)
- 1.4 Name the Act that regulates atmospheric pollution. (1)
- [15]**

**QUESTION 2**

- 2.1 Complete the following sentences by filling in the missing word(s). Write only the word next to the question number (2.1.1–2.1.4) in the ANSWER BOOK.
- 2.1.1 Engineering drawing is the ... that engineers, artisans, architects and other technical people use to ... with each other. (2)
- 2.1.2 The purpose of an engineering drawing is to give a ... an object looks like. (1)
- 2.1.3 All dimensions on a drawing should be in the same ... (1)
- 2.1.4 Engineering designers, industrial designers and architects have different approaches to ... in their work. (1)
- 2.2 Explain how you will go about when bisecting a line, given that line AB is 80 mm. Show these dimensions by means of a sketch. (5)
- [10]**

**QUESTION 3**

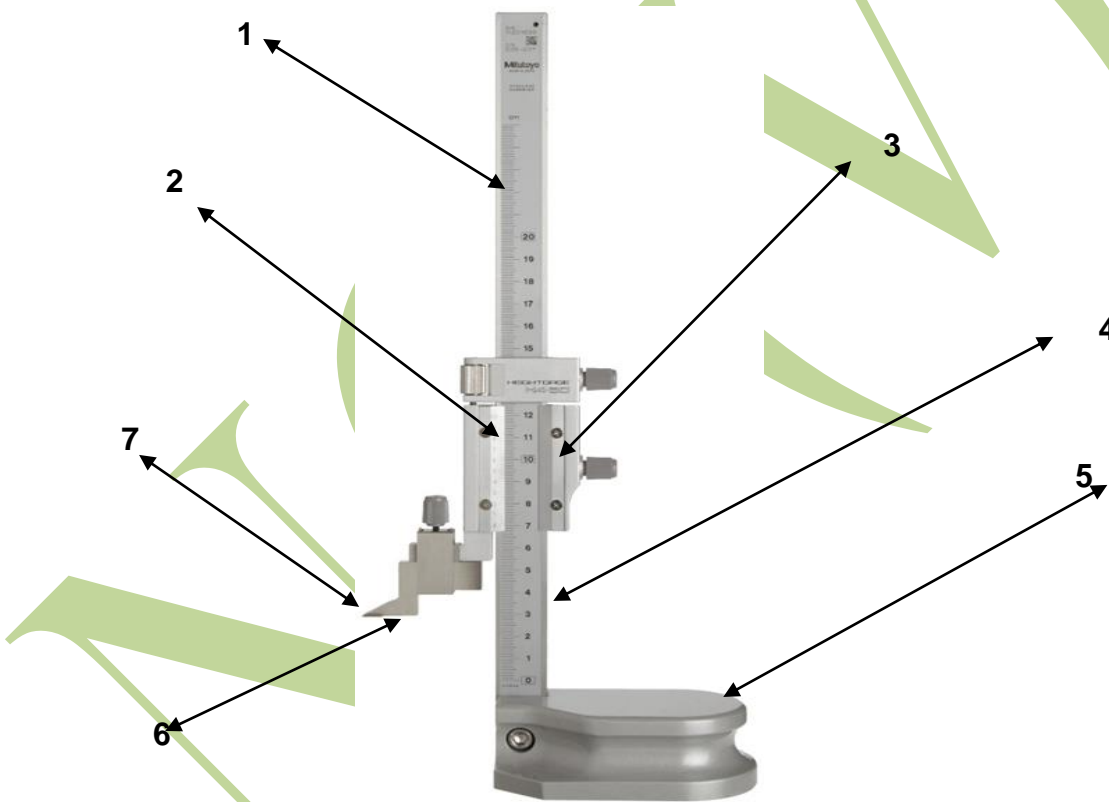
3.1 You are required to drill a work piece which you need to keep in place by using a holding device or clamp.

What FIVE factors should be considered when working on the piece held with a clamp? (5)

3.2 Files are classified into different categories.

With the aid of sketches, identify THREE different types of file cuts. (3 x 2) (6)

3.3 Identify the tool/instrument shown in FIGURE 1 below and identify the numbered parts (1–7) and write the answers in the ANSWER BOOK.



**FIGURE 1** (8)

3.4 Flat chisels are used for a variety of purposes such as shearing sheet metal or removing rivet heads.

Which SIX safety precautions would you follow when using a chisel? (6)

3.5 Explain the purpose of measuring and marking tools. (2)

3.6 When caring for a surface gauge, which THREE general rules should be observed? (3)

**[30]**

**QUESTION 4**

- 4.1 With the aid of a freehand sketch, draw the following arc welding joints. Also, include the welding symbol next to each of the arc welding joints that you have drawn:
- 4.1.1 Double v-butt weld (3 x 3) (9)
- 4.1.2 Double fillet weld
- 4.1.3 Edge weld
- 4.2 Soldering is performed for different applications. Name any FOUR of such applications. (4)
- 4.3 Make a freehand sketch of a soldering iron and label it. (7)
- 4.4 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (4.4.1–4.4.2) in the ANSWER BOOK.
- 4.4.1 Tinning is the filing of the iron tip of a soldering iron to make it smooth for soldering.
- 4.4.2 For good soldering, always keep the tip coated with a thin layer of solder. (2 x 1) (2)
- 4.5 A certain worker in your firm has to perform different tasks using an oxy-acetylene welding plant. He/She has to use different types of flames. Name THREE types of flames that can be set by adding or taking away oxygen to the acetylene flame. (3)
- [25]**

**QUESTION 5**

- 5.1 Construct a table showing each of the four types of metals given below. Choose TWO metal types and TWO types of methods or tests that help show FOUR differences between those metals. Write your answers within the TABLE you have constructed in the ANSWER BOOK.
- Cast iron
  - Mild steel
  - Cast steel
  - High-speed steel
- (4 x 2 + 2) (10)

5.2 Jeff is in charge of the production processes in their workplace. The production has been slow lately because of accidents. Then the management instructed Jeff to produce a work permit in order to improve the situation.

5.2.1 Explain what the permit-to-work document is used for.

5.2.2 In connection with the above information, name the safety procedures to be implemented before commencement of work.

(2 x 2) (4)

5.3 A fellow worker has the task of manufacturing a container in which submerged automatic switches for an underwater machine have to be kept. The supervisor advises the worker to use the type of material that has a wide range of characteristics. The supervisor also suggests that instead of nylon, Teflon be used.

Identify THREE characteristics of Teflon and another THREE for nylon.

(3 x 2) (6)  
**[20]**

**TOTAL: 100**