



# higher education & training

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

## **NATIONAL CERTIFICATE (VOCATIONAL)**

### **FITTING AND TURNING NQF LEVEL 2**

(6011042)

**22 November 2019 (Y-Paper)  
13:00–16:00**

**This question paper consists of 7 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. Start each question on a NEW page.
  5. Use only BLUE or BLACK ink.
  6. Write neatly and legibly.
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**QUESTION 1**

1.1 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 (1.1.1–1.1.5) in the ANSWER BOOK.

1.1.1 The ... makes provision for the health and safety of all persons at work.

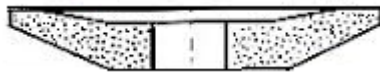
- A Occupational Health and Safety Act
- B Occupational Health and Risk Act
- C Occupational Health and Machinery Act
- D Occupational Risk and Machinery Act



1.1.2 Good housekeeping means ...

- A keeping your house in good order.
- B keeping the work area neat, tidy and free from hazards.
- C keeping the work area free from noise.
- D using safety equipment for each task.

1.1.3 Type of grinding wheel.

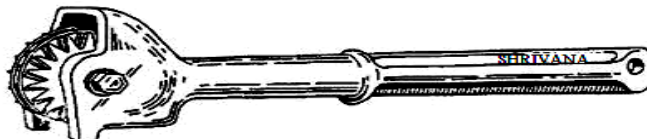


- A Saucer grinding wheel.
- B Dish grinding wheel.
- C Tapered grinding wheel.
- D Straight grinding wheel.

1.1.4 The heel of a drill bit is the ...

- A area immediately behind the cutting edge of the drill bit.
- B edge closest to the edge of the drill bit.
- C solid area of a drill bit.
- D length of the point.

1.1.5 Type of wheel dresser:



- A Diamond
- B Stone
- C Tungsten
- D Huntington

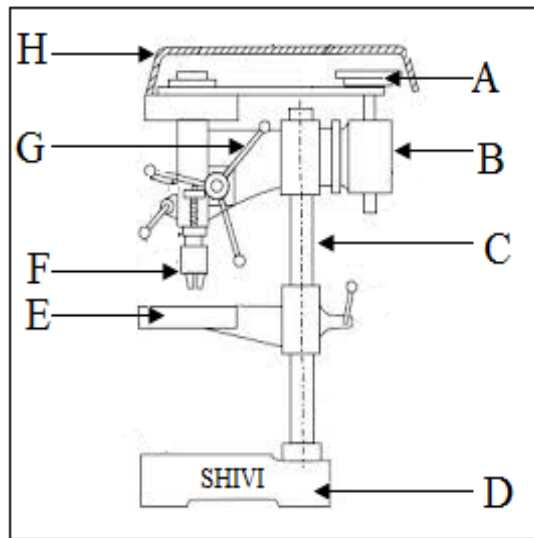


(5x 2) (10)

- 1.2 Explain how a ring-test is carried out on a grinding wheel. (5)
  - 1.3 Draw and label the following types of threads:  
V-thread, square thread and acme thread. (6)
  - 1.4 Name FOUR types of reamers commonly used in the industry. (4)
- [25]

**QUESTION 2**

2.1 FIGURE 2 shows a pillar-type drilling machine. Label items (A–H) in the ANSWER BOOK.



**FIGURE 2**

(8)

- 2.2 Choose the term from COLUMN B that matches the description in COLUMN A. Write only the letter (A–I) next to the question number (2.2.1–2.2.8) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.2.1	Supports the work piece from underneath when drilling is performed	A	V-blocks
2.2.2	Removes a taper sleeve from the taper spindle	B	sleeve
2.2.3	Supports round workpieces	C	stepped block
2.2.4	Holds and supports a work piece at a right angle	D	parallel blocks
2.2.5	Holds a work piece firmly in position	E	drift
2.2.6	Fitted to the spindle of a drilling machine	F	angle plate
2.2.7	Used to support a clamp on the opposite side of the work piece	G	G-clamp
2.2.8	Used to tighten or loosen the jaws of a chuck	H	chuck key
		I	nuts and bolts

(8 × 1) (8)

- 2.3 With neat drawings, explain the steps that are followed to drill a hole to accommodate a countersunk screw.

(6)

- 2.4 List THREE causes for a drill to break.

(3)


**[25]**

### QUESTION 3

- 3.1 Indicate whether the following statements relating to a centre lathe are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (3.1.1–3.1.5) in the ANSWER BOOK.

3.1.1 The lead screw advances the carriage during thread cutting.


3.1.2 The feed shaft advances the carriage and cross slide.

3.1.3  A driving plate is also known as a catch plate.


3.1.4 A cross slide is mounted on top of a compound slide.

3.1.5 A three-jaw chuck is a self-centring chuck.


(5 × 1) (5)

- 3.2 List FIVE machining tasks that can be performed on a centre lathe. (5)
- 3.3 Calculate the cutting speed in metres per minute if the rotational speed is 159,15 rpm and the work piece is a 60 mm round shaft. (5)
- 3.4 A work piece of 10 mm needs to be machined with a tolerance of  $\pm 0,02$  mm.  
Explain the tolerance that is required.  (5)
- 3.5 After a work piece has been manufactured, it needs to be checked to ensure that it conforms to specifications.  
List FIVE checks that have to be carried out on a completed work piece. (5)  
**[25]**

#### QUESTION 4

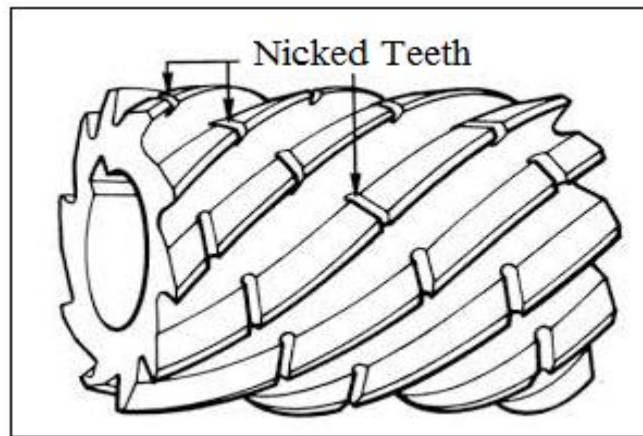
- 4.1 Give FIVE safety precautions to follow when working on a milling machine. (5)
- 4.2 List FIVE types of milling cutters.  (5)
- 4.3 Complete the following paragraph by using the word(s) in the list below. Write only the word(s) next to the question number (4.3.1–4.3.5) in the ANSWER BOOK.

clamping arrangements; milling operations; cutting speed; cutting tool;  
material

- Various (4.3.1) ... can be done on a milling machine. It is necessary to calculate the (4.3.2) ... and feed rate for the (4.3.3) ... being machined. This will also help to select the correct cutter. To ensure safety and prevent damage to the (4.3.4) ... and work piece, the work piece must be securely clamped in the (4.3.5) ... used for this job.  (5 × 1) (5)
- 4.4 Give FIVE factors that need to be considered when selecting the cutting feed on a milling machine. (5)

4.5 FIGURE 3 shows a helical cutter with nicked teeth.

List FIVE functions of the nicks on the teeth of the cutter.



**FIGURE 3**

(5)  
[25]

**TOTAL: 100**