

**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**FITTING AND TURNING
NQF LEVEL 2**

SUPPLEMENTARY EXAMINATION 2013

(6011042)

**14 March (X-Paper)
09:00 – 12:00**

This question paper consists of 7 pages and a formula sheet.

<p>TIME: 3 HOURS MARKS: 150</p>

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. ALL the sketches must be neat and in good proportion.
 5. ALL work you do NOT want to be marked, must be clearly **CROSSED OUT**.
 6. Start each question on a **NEW** page.
 7. Write neatly and legibly.
-

QUESTION 1: GENERAL

- 1.1 Choose an item in COLUMN B that matches a description in COLUMN A. Write only the letter (A – J) next to the question number (1.1.1 – 1.1.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1.1	An engineering square is the tool the fitter and turner uses for a certain purpose	A	safety signs can be placed in a machine that is not working
1.1.2	Safety signs show the safety information that you need to follow in a work area	B	a basic clearance wedge of a cutting point or a clearance angle
1.1.3	It indicates if a shaft is round or parallel	C	flat bed
1.1.4	Removing material from the top of a hole in order to make screws and rivets flush	D	measuring the squareness of a workpiece
1.1.5	This is a part on a centre lathe that has a flat guideway and can support heavy work	E	dial indicator
1.1.6	A ring test	F	improves the finishing of a workpiece
1.1.7	For a tool to cut the following must be taken into consideration	G	countersinking
1.1.8	Internal turning operations	H	crosscut chisel
1.1.9	Cutting fluid used in metal cutting operations in industry	I	facing, boring and drilling
1.1.10	To cut grooves in a material to narrow down the work piece	J	tap the wheel gently with a non-metal tool

(10)

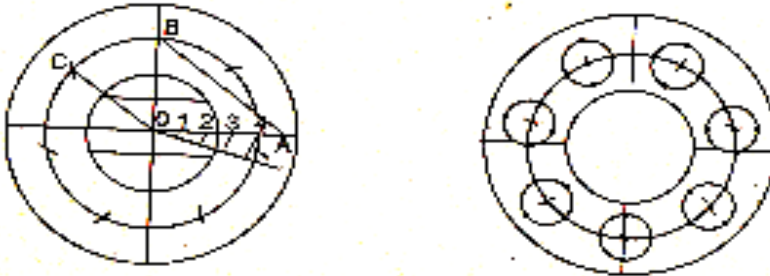
- 1.2 Mention TWO purposes of marking off in engineering

(2)

- 1.3 Name THREE different types of marking tools used in industry and state their uses.

(3)

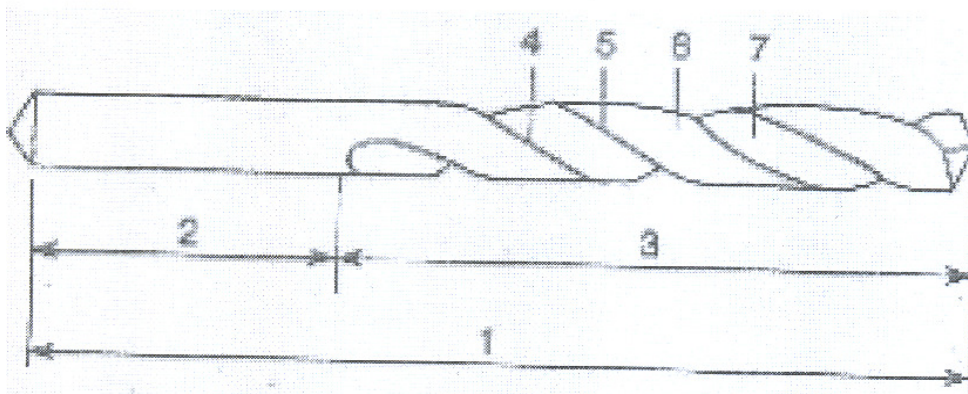
- 1.4 Seven holes must be marked-off on the face of a pipe flange. The pitch-circle diameter for the holes is 100 mm. Below is a drawing of a flange marked-off with seven holes.
Give a step-by-step description of the marking off procedure.



(3)
[18]

QUESTION 2: OPERATE AND MONITOR A DRILLING MACHINE TO PRODUCE SIMPLE COMPONENTS

- 2.1 Given below is the body of a twist drill. Write the name of each numbered part (1 – 7) in the ANSWER BOOK. (7)



- 2.2 State FIVE steps to follow before drilling a workpiece. (5)

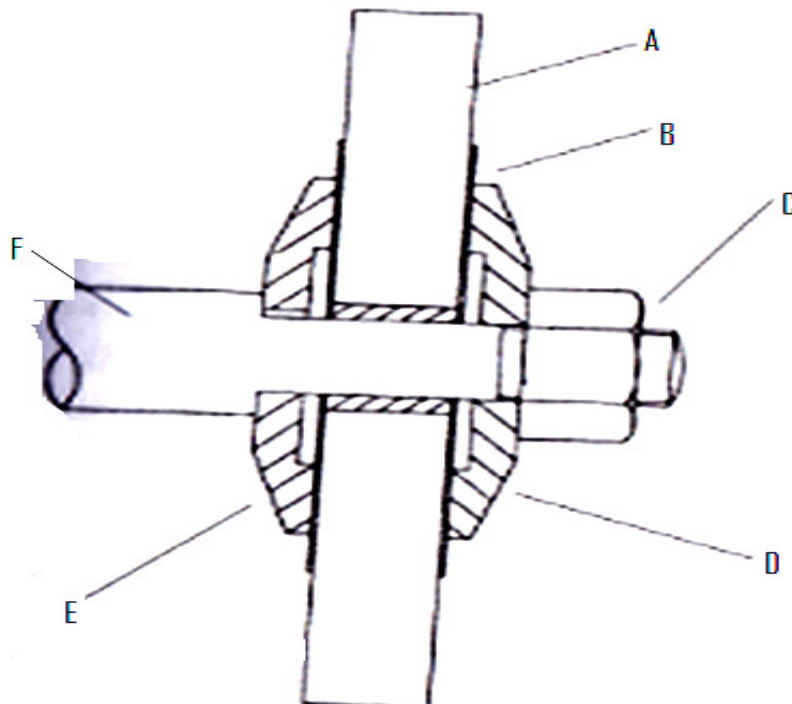
- 2.3 After you have finished machining a job, you need to record certain information in a report book. State FOUR things you have to record in a report book. (5)
[17]

QUESTION 3: OPERATE AND MONITOR A MILLING MACHINE TO PRODUCE SIMPLE COMPONENTS

- 3.1 In industry different types of machines are used to carry out different actions and to cut and shape metal. Name THREE different types of milling machines and state ONE use of each. (6)
- 3.2 A milling cutter is 140 mm in diameter and has 24 teeth. The cutting speed for the material is given at 28 metres per minute and the feed per tooth is 0,051 mm.
Calculate the revolutions per minute of the milling cutter. (5)
- 3.3 There are signs indicating that the milling machine is malfunctioning. State THREE of these signs. (3)
- 3.4 What types of instruments can you use to check the quality of the workpiece both during and after the milling process? (3)
- [17]**

QUESTION 4: OPERATE AND MONITOR A SURFACE-GRINDING MACHINE TO PRODUCE SIMPLE COMPONENTS

- 4.1 There are steps one has to follow before you start grinding a workpiece. State FOUR steps to follow when preparing for a grinding job. (4)
- 4.2 The diagram below is a drawing of a grinding wheel mounted onto a spindle. Name all the parts given from A – F in the ANSWER BOOK.



(6)

4.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (4.3.1 – 4.3.5) in the ANSWER BOOK.

4.3.1 Trueing a grinding wheel is to remove material from the cutting surface of the wheel to make the surface straight.

4.3.2 Dressing a wheel means placing a wheel correctly in the grinding machine for use.

4.3.3 Balancing a grinding wheel you have to begin by fitting the grinding wheel between two flanges.

4.3.4 If a central nut secures wheels and flanges, the thread must be in the same direction to the rotation of the spindle.

4.3.5 We must not use a cracked grinding wheel because it cannot run on the machine

(5)

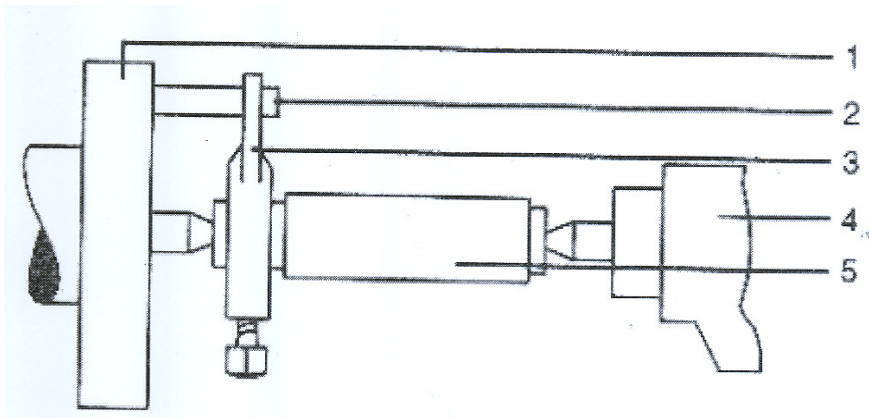
4.4 A ring test can be done on a wheel for certain reasons. Explain how it is done.

(5)

[20]

QUESTION 5: OPERATE AND MONITOR THE LATHE TO PRODUCE SIMPLE COMPONENTS

5.1 Label all the numbered parts (1 – 5) in the ANSWER BOOK.



(5)

5.2 The prescribed cutting speed for cutting cast iron with a tungsten carbide-tipped tool is given as 50 mm per min. Calculate the rotation speed in revolutions per minute of the spindle when turning a bar of 40 mm in diameter.

(3)

5.3 A 60 mm diameter shaft is 340 mm long and is to be machined in a lathe. The cutting speed is 15 m per min. If a cut is to be made at a speed of 0,8 mm per revolution, how long will the cut take?

(5)

- 5.4 Discuss how to engage the automotive or manual feed on a lathe. (3)
- 5.5 After you have finished machining a job, you need to record information in a report. State TWO things. (2)
- [18]**

QUESTION 6: PERFORM BASIC WELDING OR JOINING OF METALS

- 6.1 When welding you have to wear protective clothes. Name FOUR different types of clothing you have to wear during the welding operations. (4)
- 6.2 You can check the quality of a weld by testing it to see if it is strong. The strength of the weld depends on certain factors. State FOUR factors. (4)
- 6.3 State TWO unsafe conditions that may occur while you are welding. (2)
- [10]**

TOTAL: 100

FORMULA SHEET

$$S = \pi \times D \times N$$

$$f = ft \times T \times N$$