



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING NQF LEVEL 2

(6011042)

**12 March 2019 (X-Paper)
09:00–12:00**

Nonprogrammable calculators may be used.

This question paper consists of 6 pages.

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 section 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 maximum gap between the tool rest and grinding wheel:

- A 3 mm
- B More than 3 mm but less than 5 mm
- C Less than 5 mm but more than 3 mm
- D More than 3 mm

1.1.2 The TWO most important aspects to consider with regard to grinding wheels:

- A Abrasive chips and minimum speed rating
- B Abrasive chips and grit size
- C Grit size and minimum speed rating
- D Grit size, minimum speed rating and temperature of workpiece

1.1.3 Identify the following components:



- A Diamond wheel-dresser inserts
- B Huntington wheel-dresser inserts
- C Rose cutter
- D Slot cutter

1.1.4 The cutting angle of a drill bit for drilling mild steel:

- A 59°
- B 95°
- C 114°
- D 69°

1.1.5 The approximate soluble oil/water mixture ratio:

- A 1:24
- B 24:1
- C 1:2,4
- D 2,4:1

(5 × 2) (10)

1.2 FIGURE 1 shows a grinding wheel assembly.

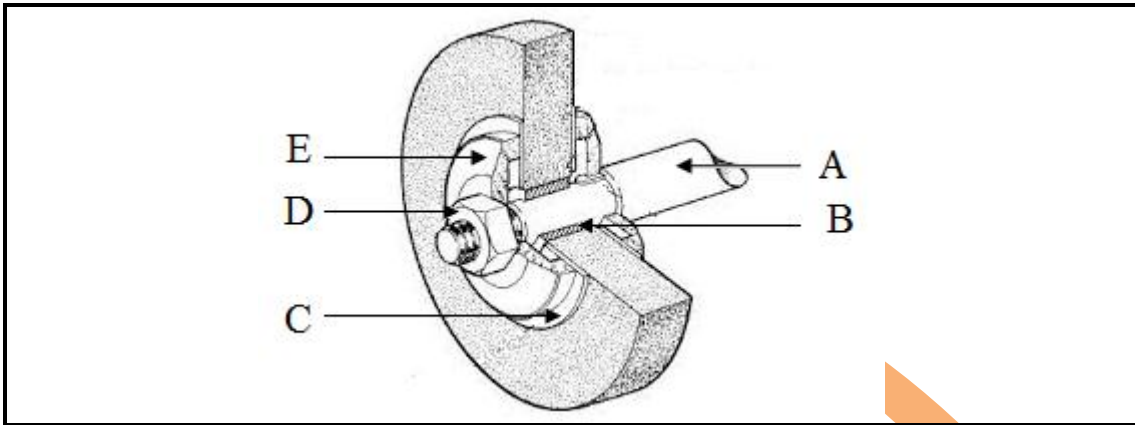


FIGURE 1

Label the grinding wheel assembly by writing only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)

1.3 List FIVE good housekeeping and safety practices associated with threading and reaming. (5)

1.4 Give FIVE functions of cutting fluids. (5)

[25]

QUESTION 2

2.1 FIGURE 2 shows a radial-arm drilling machine.

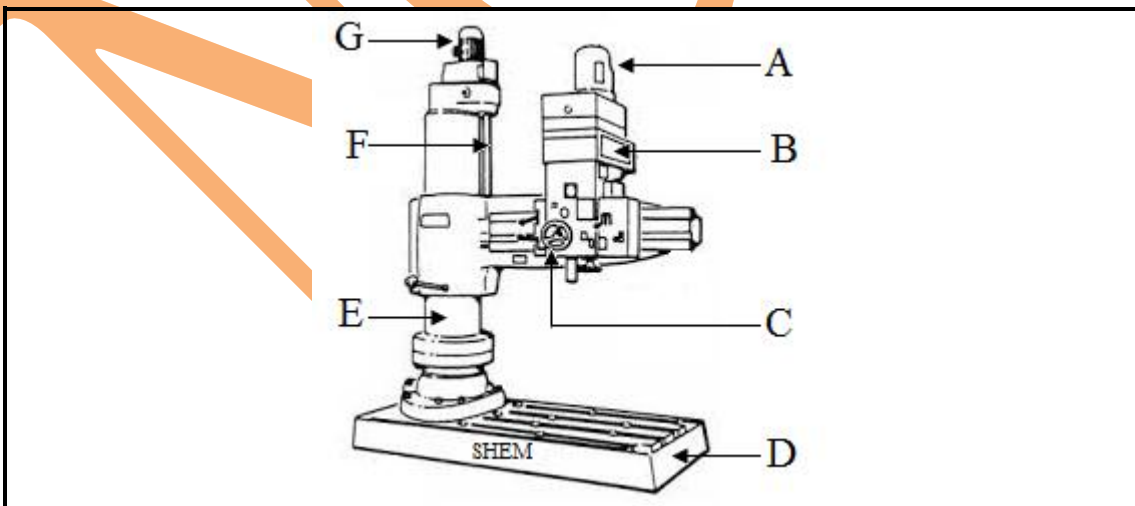


FIGURE 2

Label the radial-arm drilling machine by writing only the answer next to the letter (A–G) in the ANSWER BOOK. (7 × 1) (7)

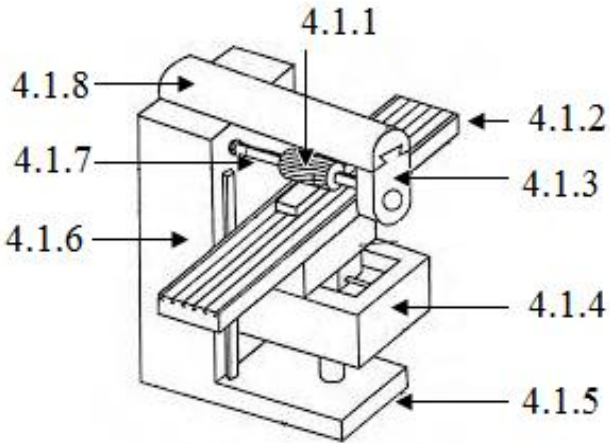
- 2.2 An aluminium workpiece has to be drilled with a 30 mm drill bit. The cutting speed for aluminium is 50 m/min.
Calculate the spindle speed (N) in revolutions per minute (5)
- 2.3 List FIVE prechecks to carry out on a pedestal-type drilling machine before commencing with drilling. (5)
- 2.4 Various types of keys are used in industry depending on the application.
Draw and label a gib head key, taper key and Woodruff key. (3 × 2) (6)
- 2.5 Name TWO types of screws that form their own threads. (2)
[25]

QUESTION 3

- 3.1 Indicate whether the following statements 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 chuck provides a range of speeds at which the spindle can rotate.
- 3.1.2 The foundation of a lathe is the bed.
- 3.1.3 The saddle fits on top of the bed and is guided by the vee and flat guideways.
- 3.1.4 The cross slide is on top of the compound slide.
- 3.1.5 The four-jaw chuck is self-centring. (5 × 1) (5)
- 3.2 Explain the difference between *manual feed* and *automatic feed*. (5)
- 3.3 Give FIVE disadvantages of a four-jaw chuck. (5)
- 3.4 A mandrel is a shaft or tube which holds workpieces accurately in position while being machined.
Draw a double-cone mandrel. Include the fixed cone, loose cone, nut and workpiece. (5)
- 3.5 List FIVE malfunctions that can occur on a centre lathe while machining a workpiece. (5)
[25]

QUESTION 4

4.1 Choose a term from COLUMN B that matches a component in COLUMN A. Write only the letter (A–J) next to the question number (4.1.1–4.1.8) in the ANSWER BOOK.

COLUMN A	COLUMN B
	A arbour support B base C arbour D cutter E table F knee G column H overarm I saddle J chuck

(8 × 1)

(8)

4.2 List the personal protective equipment (PPE) that must be worn when working with a milling machine.

(5)

4.3 Give FIVE factors to consider when selecting the cutting feed on a milling machine.

(5)

4.4 Explain what must be monitored on a milling machine during a machining process.

(5)

4.5 Explain the term *roughing cut*.

(2)

[25]

TOTAL: 100