higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING
NQF LEVEL 2

(6011042)

2 December 2020 (X-paper)
09:00–12:00

This question paper consists of 8 pages.

201Q1N2002

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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. Write neatly and legibly.

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QUESTION 1

1.1 Choose a term from COLUMN B that matches the description in COLUMN A. Write only the letter (A–K) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

	COLUMN A		COLUMN B		
	1.1.1	Straight sloping side of thread	A	root	
	1.1.2	Angle between two screw-thread flanks	B	lead	
	1.1.3	Bottom of thread	C	root diameter	
	1.1.4	Perpendicular distance from root to crest	D	flank	
	1.1.5	Dimension across bottom of thread	E	included angle	
	1.1.6	Dimension across top or crest of thread	F	depth	
	1.1.7	Includes helix angle	G	crest diameter	
	1.1.8	Helix moves upward when screw is inserted vertically from above and turned clockwise	H	pitch	
	1.1.9	Also called effective diameter	I	pitch diameter	
	1.1.10	Helical groove cut in cylindrical rod	J	external thread	
			K	left-hand screw	
		(10 × 1)			(10)

1.2 List FIVE factors that influence the selection of a grinding wheel. (5)

1.3 Name FIVE materials from which cutting tools are made. (5)

1.4 Explain how a Huntington wheel dresser is used to dress a grinding wheel. (5)

[25]

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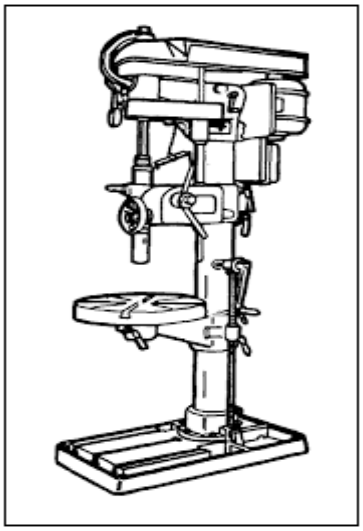
QUESTION 2

2.1 State FIVE characteristics of the pedestal drilling machine below.

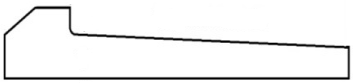


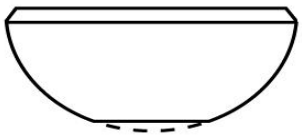
PEDESTAL DRILLING MACHINE (5)

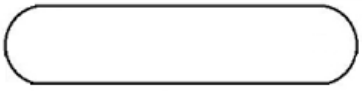
2.2 State FIVE factors that should be considered when choosing the cutting speed of a drilling machine. (5)

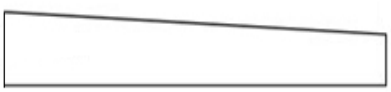
2.3 Name FIVE good housing practices related to drilling. (5)

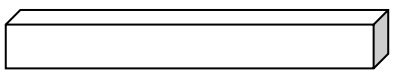
2.4 Identify each type of industrial key below and write only the answer next to the question number (2.4.1–2.4.5) in the ANSWER BOOK.

2.4.1 

2.4.2 

2.4.3 

2.4.4 

2.4.5 

(5 × 1) (5)

2.5 Complete the following sentences by choosing words from the list below. Write only the words next to the question number (2.5.1–2.5.5) in the ANSWER BOOK.

drive screws; self-tapping screws; thread cutting screws; threaded fasteners; cap screws; set screws

2.5.1 …. produce their own mating threads.

2.5.2 … produce their own threads as they are screwed into a previously drilled pilot hole.

2.5.3 … are driven into material with a hammer.

2.5.4 … are made from heat-treated steel and have threads for their entire length.

2.5.5 … have heads such as hexagons and sockets.

(5 × 1) (5)
[25]

QUESTION 3

3.1 Name FIVE pieces of personal protective equipment (PPE) that must be worn when working on a centre lathe. (5)

3.2 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (3.2.1–3.2.5) in the ANSWER BOOK.

3.2.1 The carriage of a centre lathe consists of a saddle, a cross slide and an apron.

3.2.2 The cross slide has a graduated sleeve fitted behind the hand wheel to allow accurate adjustments.

3.2.3 The compound slide of the centre lathe is fitted on top of the cross slide.

3.2.4 The apron on a centre lathe can only be moved manually.

3.2.5 The purpose of a chuck on a lathe is to hold the cutting tool securely.

(5 × 1) (5)

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3.3 Name FIVE types of centre lathe cutting tools. (5)

3.4 Give FIVE advantages of using mandrels while machining a workpiece on a lathe. (5)

3.5 Below are different types of centres used on a centre lathe.

Name each centre by writing only the answer next to the question number (3.5.1–3.5.5) in the ANSWER BOOK.

3.5.1



3.5.2



3.5.3



3.5.4



3.5.5



(5 × 1) (5)
[25]

QUESTION 4

4.1 Various options are given as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) next to the question number (4.1.1–4.1.6) in the ANSWER BOOK.

4.1.1 Provides support and correct alignment for arbor on milling machine:

A Column
B Arbor
C Arbor support
D Overarm

4.1.2 Drives and holds cutters of milling machine in correct position:

A Arbor
B Overarm
C Arbor support
D Column

4.1.3 Fits and clamps overarm:

A Overarm
B Arbor
C Arbor support
D Column

4.1.4 Supports and guides knee vertically:

A Overarm
B Column
C Arbor support
D Arbor

4.1.5 Fits on top of knee:

A Saddle
B Arbor
C Arbor support
D Column

4.1.6 Bottom of milling machine supporting column:

A Overarm
B Arbor
C Base
D Saddle

(6 × 1) (6)

4.2 List FIVE safety precautions when operating a milling machine. (5)

4.3 Calculate the spindle speed in r/min if the cutting speed for aluminium is 60 m/min and a 50 mm diameter HSS cutter is used to cut the workpiece. (5)

4.4 Give THREE functions of a cutting fluid. (3)

4.5 List FOUR possible malfunctions on milling machines. (4)

4.6 State TWO quality checks carried out on a workpiece that has been machined on a milling machine. (2)

[25]

TOTAL: 100

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