



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING NQF LEVEL 3

(6011043)

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

This question paper consists of 5 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: BEARINGS

1.1 State TWO categories into which bearings can be classified. (2)



1.2 Name the components of the bearing shown below in FIGURE 1 by writing only the correct component next to the letters (A–E) in the ANSWER BOOK.

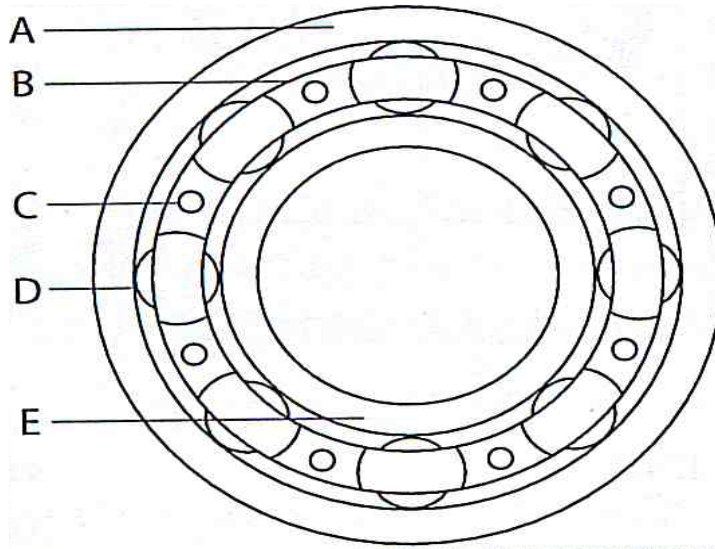


FIGURE 1

(5)

1.3 State THREE main types of loads applicable to antifriction bearings. (3)

1.4 State TWO advantages of antifriction bearings. (2)



1.5 State THREE causes of overheating in bearings. (3)

[15]

QUESTION 2: COUPLINGS

2.1 State THREE purposes for using couplings in machinery. (3)

~~✗~~ (3)

2.2 State the THREE main groups into which couplings are classified. (3)



2.3 State FOUR faults that one should look out for during a coupling operation that would indicate that there is something wrong with the coupling. (4)

[10]

QUESTION 3: BRAKES AND CLUTCHES

3.1 FIGURE 2 below shows a diagram of a brake.

3.1.1 Name the type of brake.  (1)

3.1.2 Label the components by writing the answers next to the letters (A–E) in the ANSWER BOOK.

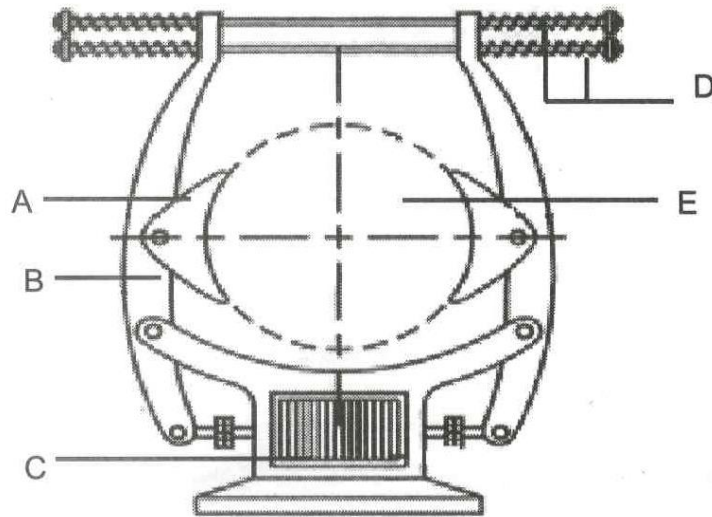




FIGURE 2 (5)

3.2 State TWO causes of a slip on a clutch and explain how each can be remedied.  (4)
[10]

QUESTION 4: BELT DRIVES, CHAIN DRIVES AND GEAR DRIVES

4.1 Explain the function of a V-belt. (1)


4.2 List FIVE advantages of belt drives when compared to gear drives. (5)

4.3 Explain the purpose of intermediate gears.  (2)



4.4 Explain FIVE safety precautions to take when working on chain drives. (5)

4.5 Name TWO applications where gears are used. (2)
[15]



QUESTION 5: PIPES, PIPE FITTINGS AND VALVES

- 5.1 Distinguish between the TWO different types of plastic piping. (2)
- 5.2 State THREE advantages of compression fittings. (3)
- 5.3 Explain TWO functions of a valve.  (2)
- 5.4 State any THREE valves that are used for liquids. (3)
- [10]**

QUESTION 6: CENTRE LATHE

- 6.1 State FIVE operation hazards one can encounter when working on a lathe. (5)
- 6.2 The cutting speed for medium carbon steel is 25 m/min.
Calculate the rotational speed in r/s when turning a bar with a diameter of 50 mm.  (4)
(HINT: $S = \pi \times D \times N$)
- 6.3 State FOUR factors on which the feed rate depends. (4)
- 6.4 State FOUR reasons why automatic feed would be preferred to manual feed on a lathe.  (4)
- 6.5 State THREE types of operations which can be performed by a lathe. (3)
- [20]**

QUESTION 7: MILLING MACHINE

- 7.1 Explain FOUR steps an artisan must follow when preparing a milling machine for operation.  (4)
- 7.2 State FOUR safety precautions applicable when working on milling machines. (4)
- 7.3 State FIVE reasons for using cutting fluids when doing machining on a milling machine. (5)
- 7.4 A milling cutter is 25 mm in diameter and has 4 teeth. The cutting speed for the material is given as 45 m/min and a feed of 0,18 mm per tooth. (6)
Calculate the feed rate in mm/min. 
(Hint: $S = \pi \times D \times N$ and $f = f_t \times T \times N$)
- 7.5 Name the most common type of coolant used when milling a workpiece. (1)
- [20]**

TOTAL: 100