higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING
NQF LEVEL 3

(6011043)

10 March 2020 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

391Q1S2010

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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. Use only a blue or black pen.
6. Write neatly and legibly.

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QUESTION 1: BEARINGS

1.1 Name THREE types of materials used in plain bearings. (3)

1.2 State FIVE main causes of damage to bearings. (5)

1.3 State THREE implications when the wrong sequencing of activities is followed during the replacement of bearings. (3)

1.4 Make neat, labelled sketches to show the difference between *point contact* and *line contact* of bearings. (4)

[15]

QUESTION 2: COUPLINGS

2.1 FIGURE 1 shows a diagram of a coupling.

2.1.1 Name the type of coupling. (1)

2.1.2 Name the components indicated in FIGURE 1 by writing the answer next to the letter (A–E) in the ANSWER BOOK.

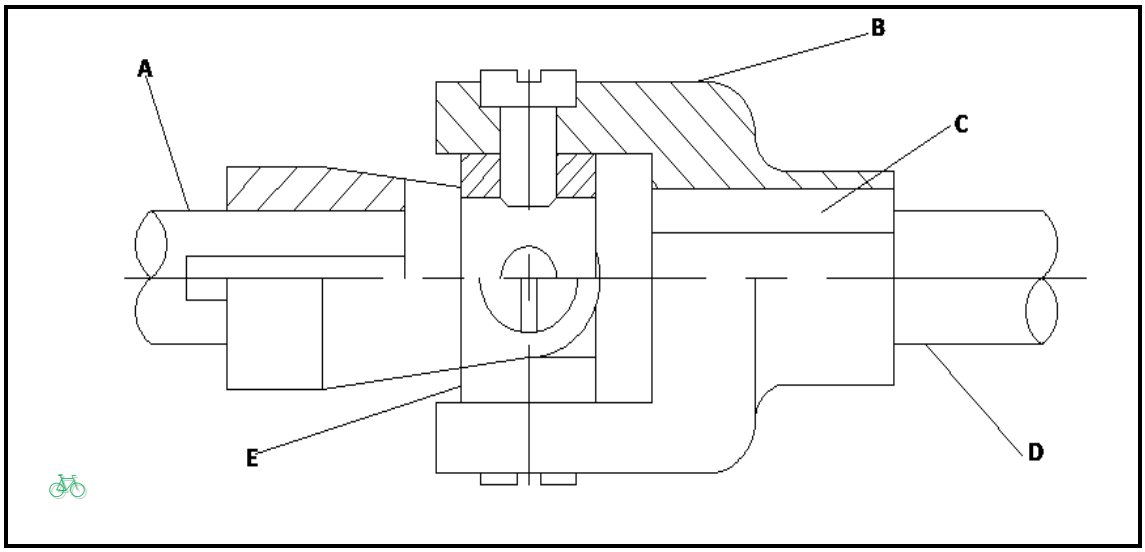


FIGURE 1 (5)

2.2 State FOUR basic methods of coupling alignment. (4)

[10]

QUESTION 3: BRAKES AND CLUTCHES

3.1 Give TWO reasons why the air gaps on brakes and clutches have to be measured. (2)

3.2 During a hydraulic system inspection, no leaks were found but the system does not function properly.

State TWO problems that could be the reason for this malfunction. (2)

3.3 Explain in your own words why it is necessary to clean the brake and clutch parts before they are inspected. (2)

3.4 State FOUR types of brake systems. (4)
[10]

QUESTION 4: BELT DRIVES, CHAIN DRIVES AND GEAR DRIVES

4.1 Name the components indicated in FIGURE 2 by writing the answer next to the letter (A–D) in the ANSWER BOOK.

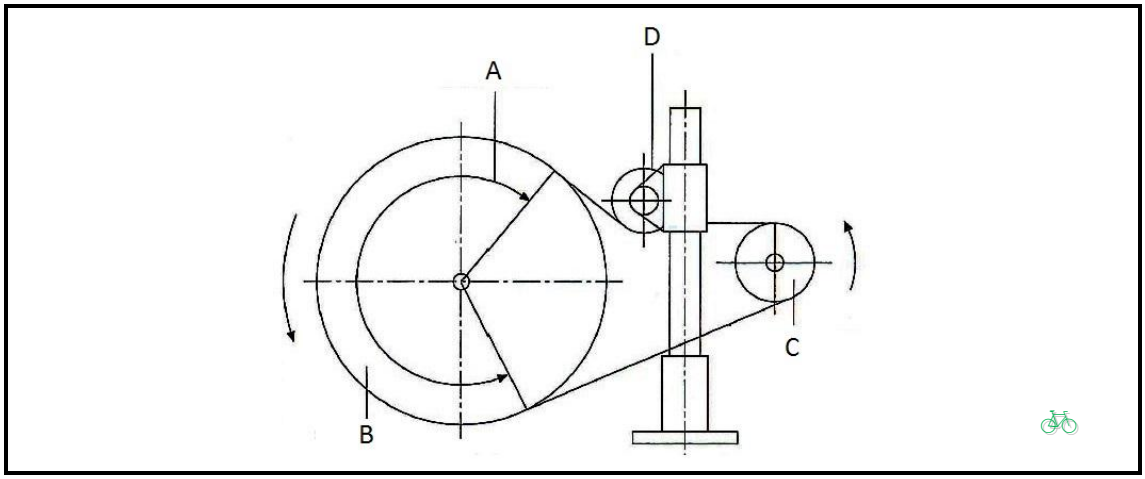


FIGURE 2 (4)

4.2 Name THREE types of chain sprockets. (3)

4.3 Make a neat, labelled sketch of an oil stream lubrication system. (5)

4.4 State THREE advantages of gear drives compared to chain drives. (3)
[15]

QUESTION 5: PIPES, PIPE FITTINGS AND VALVES

5.1 State FIVE reasons for flange joint failures. (5)

5.2 An artisan dismantles a valve and wants to do an inspection for non-conformance of the parts.

Name FIVE parts that must be inspected. (5)
[10]

QUESTION 6: CENTRE LATHE

6.1 State THREE problems that can occur with the cutting tools when using a lathe and give their possible causes. (6)

6.2 A carbon steel pin with a diameter of 20 mm is rotating at 1 500 r/min on a centre lathe.

Calculate the cutting speed (S) of the tool in metres per minute (m/min) to carry out the machining process.

HINT: $S = \pi \times D \times N$ (3)

6.3 State TWO advantages and THREE disadvantages of a three-jaw chuck. (5)

6.4 Describe in FIVE steps how you would fit the selected cutter in the tool post and adjust it to be set at centre height. (5)

6.5 Explain why guards or shields must be fitted on a centre lathe. (1)
[20]

QUESTION 7: MILLING MACHINE

7.1 Name FOUR types of milling cutters. (4)

7.2 State FOUR safety precautions applicable when working on milling machines. (4)

7.3 State FOUR types of indexing that can be performed on a milling machine. (4)

7.4 A milling cutter is 25 mm in diameter and has 4 teeth. The cutting speed for the material is given as 20 m/min and a feed of 0,05 mm per tooth.

Calculate the feed in mm/min.

HINT: $S = \pi \times D \times N$ and $f = f_t \times T \times N$ (6)

7.5 State TWO methods of filing a report that an artisan completes to make sure it is recorded and saved. (2)
[20]

TOTAL: 100

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