higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING
NQF LEVEL 3

(6011043)

9 March 2022 (X-paper)
09:00–12:00

This question paper consists of 6 pages.

285Q1S2209

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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. Start each question on a new page.
5. Draw all diagrams neatly and in good proportion.
6. Use only a black or blue pen.
7. Write neatly and legibly.

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QUESTION 1: BEARINGS

1.1 Explain FIVE common types of damage on a bearing. (5)

1.2

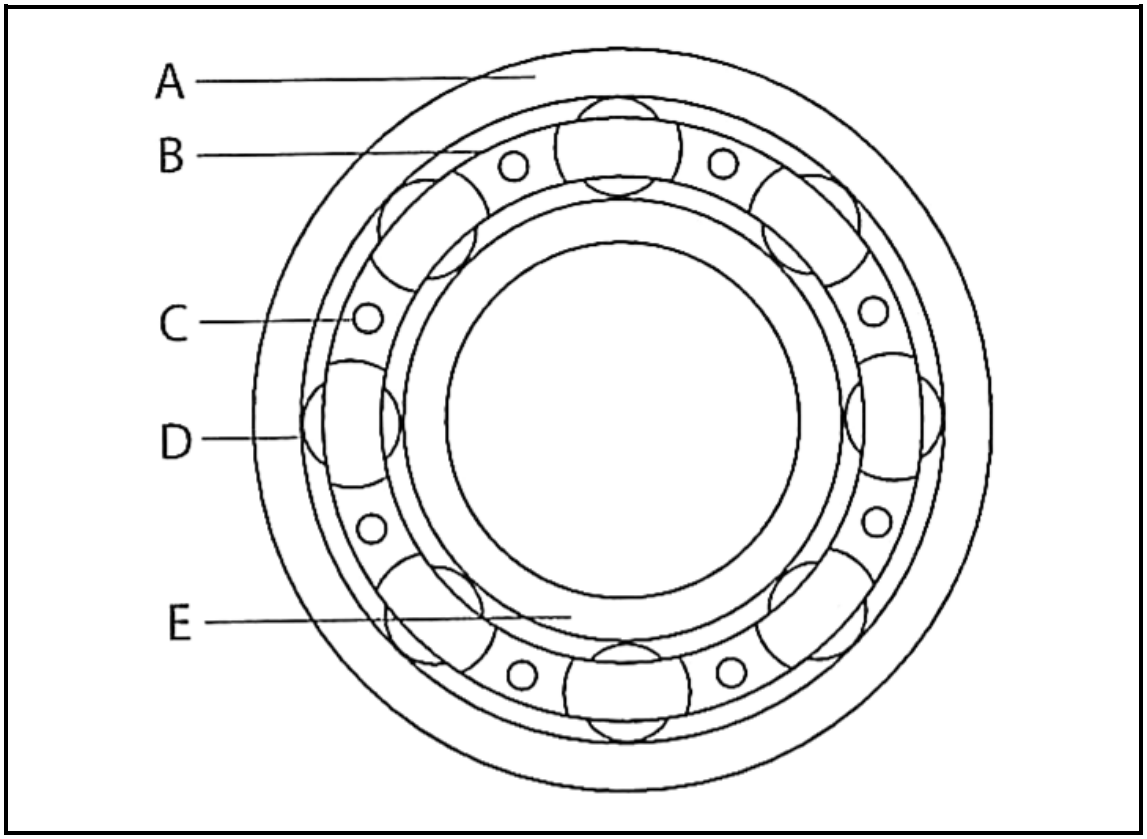

FIGURE 1

Label the components of the bearing shown in FIGURE 1 (above) by writing only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)

1.3 Give THREE advantages and TWO disadvantages of plain bearings. (3 + 2) (5)

[15]

QUESTION 2: COUPLINGS

2.1

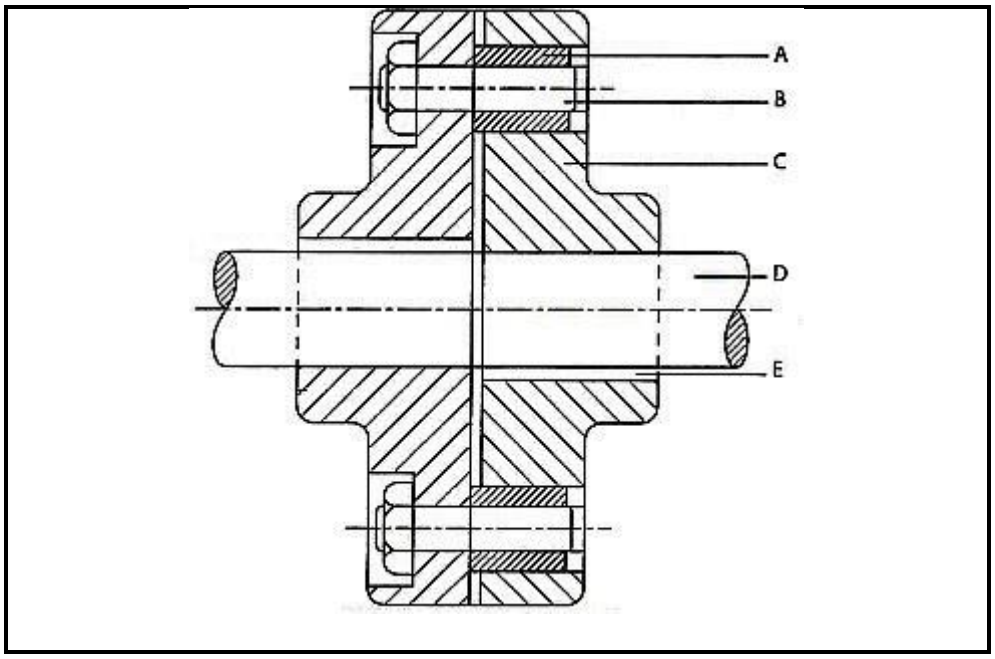

FIGURE 2

2.1.1 Name the type of coupling shown in FIGURE 2. (1)

2.1.2 Label the components of the coupling shown in FIGURE 2 (above) by writing only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)

2.2 State FOUR basic methods of coupling alignment. (4)
[10]

QUESTION 3: BRAKES AND CLUTCHES

3.1 State FOUR functions of brake systems. (4)

3.2 Give TWO advantages of electromagnetic brake systems. (2)

3.3 State FOUR faults that normally occur on brakes and clutches. (4)
[10]

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QUESTION 4: BELT DRIVES, CHAIN DRIVES AND GEAR DRIVES

4.1

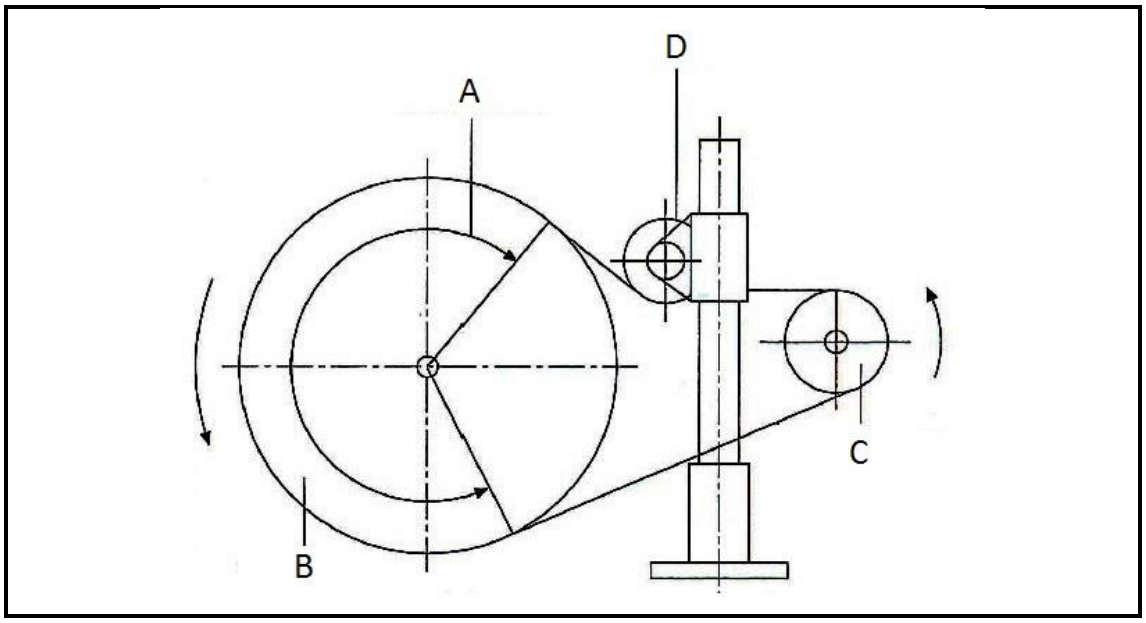

FIGURE 3

Label the components of the V-belt drive shown in FIGURE 3 (above) by writing only the answer next to the letter (A–D) in the ANSWER BOOK. (4 × 1) (4)

4.2 List THREE types of chain sprockets. (3)

4.3 Give THREE advantages and THREE disadvantages of V-belt drives when compared to chain and gear drives. (3 + 3) (6)

4.4 Explain the term *backlash* as it applies to gears. (1)

4.5 Give an advantage of using a helical gear over a spur gear. (1)

[15]

QUESTION 5: PIPES, PIPE FITTINGS AND VALVES

5.1 Make neat sketches of a pipe and indicate the following dimensions:

A Pipe length
B Wall thickness
C Outside diameter
D Inside diameter (6)

5.2 Name FOUR types of valves used in the industry. (4)

[10]

QUESTION 6: CENTRE LATHE

6.1 State FIVE centre lathe operation hazards. (5)

6.2 The rotational speed for mild steel is 900 r/min.

Calculate the cutting speed (S) in m/min when turning a bar with a diameter of 30 mm.

HINT: S = π × D × N (3)

6.3 Explain the FIVE steps to follow when setting a cutting tool at centre height before turning a workpiece on a lathe. (5)

6.4 Give THREE advantages and TWO disadvantages of a three-jaw chuck. (3 + 2) (5)

6.5 Name TWO types of steadies used on a lathe for turning operations. (2)
[20]

QUESTION 7: MILLING MACHINE

7.1 Give FIVE reasons why cutting fluids are used when doing machining on a milling machine. (5)

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

7.3 List FIVE malfunctions that may occur when doing machining on a milling machine. (5)

7.4 A milling cutter is 80 mm in diameter and has 12 teeth. The cutting speed (S) for the material is given as 36 m/min and a feed of 0,05 mm per tooth.

Calculate the feed in mm/min.

HINT: S = π × D × N and f = fł × T × N (6)
[20]

TOTAL: 100

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