higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING
NQF LEVEL 3

(6011043)

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09:00–12:00

This question paper consists of 6 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
FITTING AND TURNING
NQF LEVEL 3
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 black or blue pen.
5. Write neatly and legibly.

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QUESTION 1: BEARINGS

1.1 Explain the importance of a clean working area when working with bearings in the workplace. (1)

1.2 List THREE procedures that may be carried out if one is to isolate equipment electrically from other energy sources in the workplace. (3)

1.3 Name THREE methods that may be applied for the safe removal of a bearing during maintenance. (3)

1.4 State THREE disadvantages of anti-friction bearings. (3)

1.5 Explain the importance of the following when working with bearings:

1.5.1 Interpret engineering drawing

1.5.2 Determine a maintenance schedule

(2)
[12]

QUESTION 2: COUPLINGS

2.1 Which type of coupling allows for a degree of misalignment? (1)

2.2 List THREE things that one would look for before lubricating and reassembling a coupling according to the prescribed method. (3)

2.3 List FOUR things that one would will look for when inspecting the coupling onsite or in the repair workshop. (4)

2.4 Proper alignment between driving and driven equipment is very important when a coupling is fitted between two shafts.

Identify TWO things that may cause shafts to run out of centre on the coupling which might lead to it not functioning at its best. (2)
[10]

QUESTION 3: BRAKES AND CLUTCHES

3.1 Differentiate between a *brake system* and a *coupling* in terms of their functions. (2)

3.2 Explain how a thruster brake operates. (4)

3.3 List TWO faults that normally occur in brakes and clutches. (2)
[8]

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QUESTION 4: V-BELT, CHAIN AND GEAR DRIVES

4.1 List FOUR features that should be included in properly designed safety guards when working with V-belts, chain drive and gear drives (4)

4.2 State THREE functions of the jockey pulley or idler pulleys in V belts. (3)

4.3 For increased power transmission, multi-strand transmission chains are used.

Name THREE different types of multi-strand transmission chains. (3)

4.4 State FOUR reasons why the working area should be clean when working with chain drives. (4)

4.5 List FOUR potential areas of defect and wear that might lead to breakdown in a gearbox train. (4)

4.6 Explain the meaning of the term, *gear backlash,* as it is used in the engineering workplace. (2)

[20]

QUESTION 5: PIPES, PIPE FITTING AND VALVES

5.1 Explain the function of the following pipe fittings:

5.1.1 Couplings and sockets

5.1.2 Bends and elbows

5.1.3 Reducing sockets

(3 × 1) (3)

5.2 State TWO reasons that may cause flanged joints to fail. (2)

5.3 List THREE things that one will look for when conducting quality checks in the pipe system, pipe fittings and valves. (3)

5.3 What is the main purpose of installing a non-return valve in a pipeline system? (2)

[10]

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QUESTION 6: CENTRE LATHE

6.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (6.1.1−6.1.5) in the ANSWER BOOK.

6.1.1 To check the external diameter to an accuracy of 0,01 mm, it is best to use a Vernier calliper.

6.1.2 A pentagon shape can be held in a three-jaw chuck of a centre lathe.

6.1.3 A thin layer of Prussian blue can be applied along the length of a taper gauge if it does not have a high and low limit indicator when measuring the size of a tapered reamed hole.

6.1.4 If one is to take large cuts on centre lathe, a long tube should be placed over the chuck key handle to achieve additional tightening.

6.1.5 Inserted carbide tools consistently give a good finish at higher cutting speeds and feeds and also have a longer tool life.

(5 × 1) (5)

6.2 Explain why some centre lathe operators prefer brazed carbide tips when machining components on a centre lathe. (2)

6.3 List FIVE steps that need to be followed when setting the cutter against the workpiece and adjusting the cutting depth when the cross-slide and compound slide is set to zero. (5)

6.4 Explain why a tapered bush should be measured in the following situations:

6.4.1 If the gauge has a high and low limit indicator

6.4.2 If the gauge does not have a high and low limit indicator

(2 × 1) (2)

6.5 List TWO ways that may be used if one is to check the cutting surface finish for correctness according to specifications. (2)

6.6 State TWO reasons why reporting and recording malfunctions are important once being noticed by machine operator. (2 × 2) (4)

[20]

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QUESTION 7: MILLING MACHINE

7.1 List FOUR things that need to be done in the workshop to ensure that the work area where the milling operation is taking place is free and spacious. (4)

7.2 Name FIVE parts of the dividing head. (5)

7.3 Thoroughly explain how the squareness of a machined rectangular block should be checked during the milling process. (3 × 2) (6)

7.4 Explain the functions of the following tools and measuring equipment during milling operation:

7.4.1 Micrometre

7.4.2 Vernier calliper

7.4.3 Precision square

7.4.4 Scratch block

7.4.5 Edge finder

(5 × 1) (5)
[20]

TOTAL: 100

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