higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

FITTING AND TURNING
NQF LEVEL 3

NOVEMBER EXAMINATION

(6011043)

26 November 2014 (X-Paper)
09:00–12:00

This question paper consists of 7 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. Write neatly and legibly.

QUESTION 1: GENERAL

1.1 When is it compulsory to wear hard hats? (1)

1.2 Joe disposes of used oil in the municipal drain.

1.2.1 Is this correct? (1)

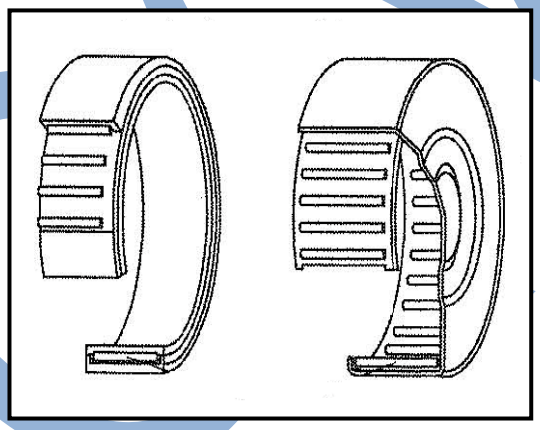
1.2.2 If not, what should he do? (1)

1.3 Name a manufacturer's specification that promotes good housekeeping. (1)
[4]

QUESTION 2: BEARINGS

2.1 Into which TWO categories can bearings be classified? (2)

2.2 Name the bearing shown below.



(1)

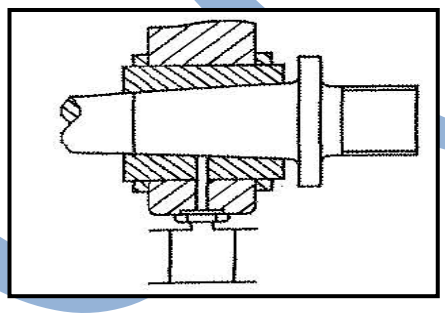
2.3 Why are cylindrical roller bearings generally used for heavier loads? (1)

2.4 Complete the chart below by filling in the missing parts regarding materials used for bearings. Write only the answer next to the question number (**2.4.1**–**2.4.5)** in the ANSWER BOOK.

Material	Properties	Composition
2.4.1	Load carrying capacity very low	Sulphur, manganese, phosphorus and free graphite
2.4.2	Its composition provides corrosion resistance (zinc) Compatibility and embedability (lead) Strength and hardness (zinc)	A copper alloy consisting of zinc lead, lead, tin and aluminum
White metal	Low fatigue, compatibility and embedability	**2.4.3**
Teflon	**2.4.4**	A synthetic material that can be combined with silicone for hardness
2.4.5	No lubrication required, used in appliances, fax machines and copiers, etc.	A synthetic material

(5)

2.5 Identify the bearing below and give an example of where it is used on the centre lathe.



(2)

2.6 State the reason for using a bearing separator? (2)

[13]

QUESTION 3: COUPLINGS

3.1 Name the THREE groups into which couplings are classified and give an example for each group. (6)

3.2 As a fitter you are doing maintenance in a manufacturing plant. You need a coupling that is flexible, torsionally elastic and allows misalignment in all planes.

3.2.1 Which coupling would you choose? (1)

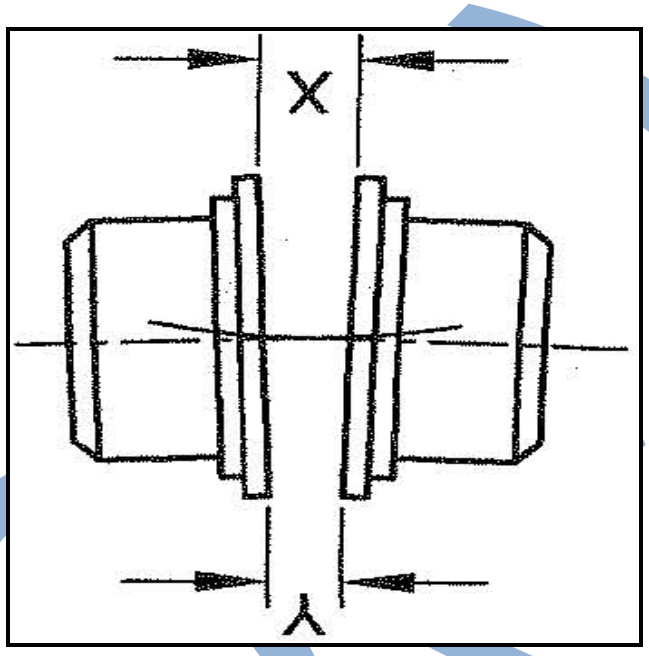
3.2.2 Give a reason for your choice. (1)

3.3 What causes pins, bolts and links on couplings to become loose? (1)

3.4 As a fitter and turner you completed the assembly of a coupling and is required to perform a post-operational inspection.

Name THREE important aspects that you must attend to during this inspection. (3)

3.5 What type of alignment is illustrated on the coupling bellow?



(1)
[13]

QUESTION 4: BRAKES AND CLUTCHES

4.1 Why should you clean brakes or clutches when inspecting such an assembly? (2)

4.2 Why should the load be removed before doing maintenance on brakes? (1)

4.3 Give an example of each of the following:

4.3.1 Positive clutches

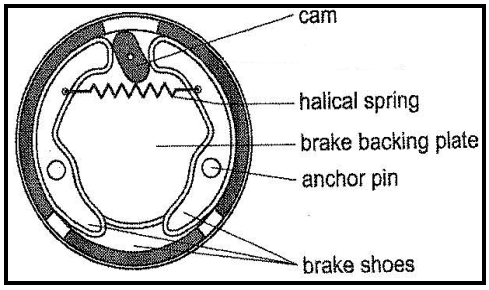
4.3.2 Friction clutches

4.3.3 Centrifugal clutches

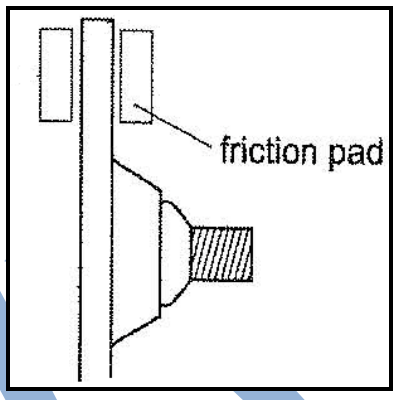
(3 × 1) (3)

4.4 Name FOUR types of brake systems. (4)

4.5 Name the brakes shown below. Write only the answer next to the question number (4.5.1–4.5.2) in the ANSWER BOOK.



4.5.1



4.5.2 (2)

4.6 What is the importance of locking devices when installing brakes and clutches? (1)

[13]

QUESTION 5: BELT DRIVES, CHAIN DRIVES AND GEAR DRIVES

5.1 Name THREE advantages of belt drives when compared to chain drives. (3)

5.2 Name TWO types of V-belts. (2)

5.3 Explain FIVE safety precautions to take when working with chain drives. (5)

5.4 List TWO basic tools or equipment that will be needed when working on gear drives. (2)

[12]

QUESTION 6: PIPES, PIPE FITTINGS AND VALVES

6.1 Distinguish between the TWO different types of plastic piping. (2)

6.2 Name FOUR advantages of compression fittings. (4)

6.3 Explain TWO functions of a valve. (2)

6.4 Name THREE valves that are used for liquids. (3)

[11]

QUESTION 7: CENTRE LATHES

7.1 A mild steel workpiece with a 30 mm diameter must be turned using a tungsten-tip tool bit.

Calculate the spindle speed in r/s at which the lathe must be set. The cutting speed is 50 m/min. Given: S = π x D x N and f = ft x T x N (4)

7.2 List FOUR factors on which the feed rate depends. (4)

7.3 A machine must be checked before starting it to see whether it is in good working order.

Name the steps that should be followed. (6)

7.4 7.4.1 Explain *facing* as applicable to centre lathes (1)

7.4.2 Give TWO methods of facing. (2)
[17]

QUESTION 8: MILLING MACHINES

8.1 Why do we have to make sure that guards are in place before the milling machine is switched on? (2)

8.2 Name FOUR types of mill cutters. (4)

8.3 A milling cutter is 25 mm in diameter and has four teeth. The cutting speed for the material is given at 24 m/min and the feed per tooth is 0,051 mm.

Calculate the feed. Given: S = π x D x N and f = ft x T x N (5)

8.4 Before attempting to use the milling machine the operator must carry out some checks to ensure the machine is in working order.

List FOUR of those checks. (4)

8.5 Once the work has been completed and checked to ensure that it is within the specifications the final report can be filled out.

List TWO operator details that must be in the report. (2)
[17]

TOTAL: 100