MARKING GUIDELINE

NATIONAL CERTIFICATE

NOVEMBER EXAMINATION

FITTING AND MACHINING N1

22 NOVEMBER 2013

This marking guideline consists of 7 pages.
MARKING GUIDE:

NATIONAL CERTIFICATE

NATIONAL EXAMINATION

OF THE REPUBLIC OF SOUTH AFRICA
QUESTION 1

1.1  
- Always use tools properly and then only for their intended purpose.
- Keep all tools clean and wipe off excess dirt and grease using a solvent when necessary.
- Inspect tools such as chisels regularly for burrs and mushroomed heads both during and after use.
- Keep the sharp edges of tools pointed away from you, towards the back of your work bench.
- Inspect tools regularly for sharpness because a sharp tool cuts easier than a dull one.
- Never carry tools which have sharp edges in your pocket.  (Any 5 x 1)

1.2  
A  Jenny caliper  
B  Dotting punch  
C  Combination set  
D  Angle plate  
E  G or C clamp  

1.3  
1.3.1  Soft-faced hammer ~ is used to hammer delicate work pieces with finished surfaces which can easily damage.  
1.3.2  Square file ~ to file rectangular holes, slots and keyways.  
1.3.3  Cross-cut chisels ~ to cut a keyway in a shaft or grooves in work pieces.  
1.3.4  Hollow punch ~ cutting holes for bolts or studs to pass through in sealing gaskets.  
1.3.5  Chain tongs ~ used for gripping and turning pipes.  
1.3.6  Ring spanner ~ it fits completely around the bolt or nut being turned and can only be used in confined places where a flat spanner cannot be used to turn a nut.  

(6 x 1)  [16]
QUESTION 2

2.1  2.1.1

2.1.2

2.2  2.2.1  0.01 mm
     2.2.2  0.01 mm
     2.2.3  0.02 mm

(4 x 2)   (8)

(3 x 1)   (3)
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(23 x 1) [23]

**QUESTION 3**

| 3.1  | A | Pitch |
|      | B | Outside or crest diameter |
|      | C | Pitch diameter |
|      | D | Included angle |

(4 x 1) (4)

| 3.2  | 3.2.1 | Square thread |
|      | 3.2.2 | V-fine thread |

(2 x 1) (2)
3.3

3.3.1
- Shaping machine with rigid boring bar
- Milling machine with slotting attachment
- Slotting machine

3.3.2
- Key seat machine
- Shaping machine with solid grooving tool
- Milling machine using side and face cutter

(Any 2 x 2) (4)

3.4

$D = \frac{D}{6} = \frac{48}{6} = 8 \text{ mm}$

$W = \frac{D}{4} = \frac{48}{4} = 12 \text{ mm}$

(2)

3.5

Split pin is used to lock nuts in position.

(1)

3.6

Castle nut and lock nut

(2)

3.7

External cir-clip is used to prevent axial or end movement of parts

(1)

3.8

A  Circular split die
B  Two-piece rectangular die
C  Expanding reamer
D  Adjustable reamer
E  Machine reamer

(5 x 1) (5)

[21]
QUESTION 4

4.1  A  U-clamp  
     B  Off-set clamp  
     C  Finger clamp  
     (3 x 1)  (3)

4.2  •  The type of material  
     •  The diameter of the drill  
     •  The material of which the drill is made  
     •  The firmness and condition of the machine  
     •  The use of cutting fluids  
     •  The rate of the feed  
     (Any 3 x 1)  (3)

4.3  4.3.1  Is used to hold the cutting tool in position.  
     4.3.2  It gives driving motion to the cutting tools.  
     (2 x 1)  (2)

4.4  •  The lathe requires no setting-up when you mount the work piece.  
     •  You can easily mount or remove work piece.  
     •  You can ensure that external turning is true to the internal diameter.  
     •  The production of large quantities of similar work pieces is easier.  
     •  Setting is simple, quick and true.  
     •  You can adapt mandrels to suit a variety of work pieces.  
     (Any 3 x 1)  (3)

4.5  •  The set-up time to manufacture one part is a loss.  
     •  It is more expensive.  
     •  It costs a lot to repair.  
     (3 x 1)  (3)

4.6  •  Setting-over of the tail stock  
     •  Setting-over of the compound slide  
     •  The taper-turning attachment  
     (Any 2 x 1)  (2)

4.7  4.7.1  The chip that is being moved or cut from the work piece slides along the face of this angle, which varies with the type of material being cut.  
8.7.2  The wedge shape produces what is known as clearance angle on a cutting tool, for offcut material to be cleared.  
     (2 x 2)  (4)  [20]
QUESTION 5

5.1 A Ram
B Tool holder
C Clapper box
D Tool head

(4 X 1) (4)

5.2 Strokes/min = cutting speed m/min x stroke ratio
Length of stroke

= 30 m/min x 3
0.45 m 5

= 40 strokes/min

Time = width of work
Feed/stroke x 40 strokes/min

= 200
0.15 mm/strokes x 40 strokes/min

= 3.33 min

(4)

5.3 5.3.1 It is located and held by the taper in the spindle nose. The arbor drives and holds the cutters in their correct positions.

5.3.2 It provides support and the correct alignment for the arbor and you can adjust it in any position for various lengths of arbor.

5.3.3 It supports the work piece on the opposite side of the dividing head. You can adjust it in the vertical plane for taper work.

5.3.4 It is fitted to the overarm and knee of the machine to provide better support to the arbor and prevent vibration and chatter when you make heavy cuts.

(4 X 2) (8)

5.4 A shield
B Grinding wheel
C Work rest
D Wheel guard

(4 X 1) (4)
[20]

TOTAL: 100