higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION – SHEET METAL WORK
NQF LEVEL 3

(6031023)

9 March 2018 (X-Paper)
09:00–12:00

This question paper consists of 6 pages.

NCV

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.

NCV

QUESTION 1

1.1 Explain the composition of an alloy. (2)

1.2 Choose a property from COLUMN B that matches a type of cast iron in COLUMN A. Write only the letter (A–C) next to the question number (1.2.1–1.2.3) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.2.1	White cast iron	A	self-lubricating due to free graphite
1.2.2	Grey cast iron	B	used for castings that must be hard and strong
1.2.3	Mottled cast iron	C	very difficult to machine

(3 × 1) (3)

1.3 Choose a use from COLUMN B that matches a type of steel in COLUMN A. Write only the letter (A–D) next to the question number (1.3.1–1.3.4) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.3.1	Low-carbon steel	A	ball bearings
1.3.2	Medium-carbon steel	B	wire ropes
1.3.3	High-carbon steel	C	chisels
1.3.4	Tool steel	D	solid drawn wire

(4 × 1) (4)

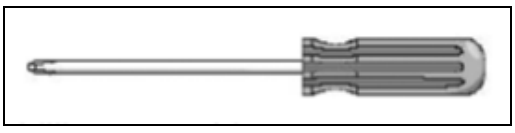
1.4 Nonferrous metals like copper and aluminium has certain electrical conductivity properties.

Which ONE of the abovementioned metals is a high-level conductor and which ONE is a low-level conductor? (2)

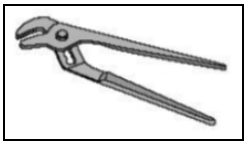
1.5 The following figures represent specific hand tools.

Identify each tool and give ONE use of each.

1.5.1



1.5.2



1.5.3



(3 × 2) (6)

1.6 The point of a cold chisel must be grounded to a specific angle for the best performance.

What must the angle be? (1)

1.7 Name FOUR grades of files. (4)

1.8 FIGURE 1 below illustrates a pedestal drilling machine.

Identify the indicated parts by writing only the answer next to letter (A–O) in the ANSWER BOOK.

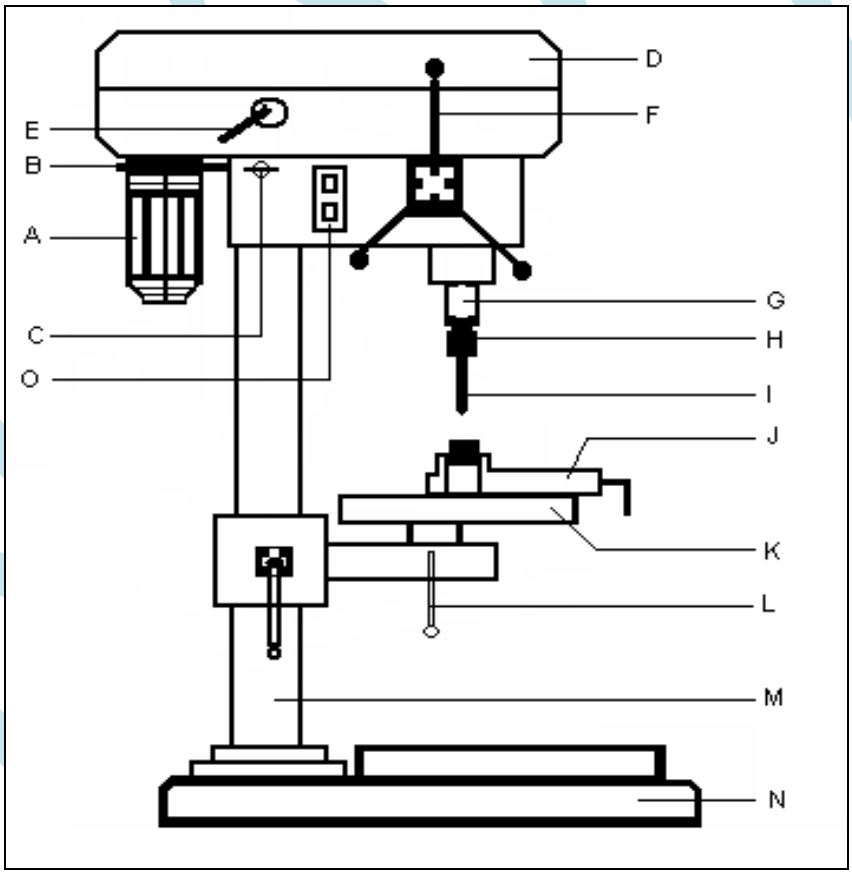


FIGURE 1 (15)

1.9 Give the main advantage of a multiple-spot welding machine. (2)

1.10 Different rivet joints are used to join components in the sheet-metal manufacturing field. One of these joints is the single-riveted butt joint with one cover strip.

Make a neat top-view drawing illustrating this type of joint and show THREE rivets in line. (5)

1.11 Calculate the rivet length when TWO plates, each with a thickness of 12 mm, are riveted together and a rivet with a 15 mm diameter is used. (3)

1.12 Re-enforcements for joints ensure that the fabricated component does not warp. One of the re-enforcement methods is the joggling method.

Make a neat sketch illustrating this method. (3)

1.13 To square off a plate means that you must mark two adjacent sides close to the edge square with each other.

Sketch and explain FOUR steps to square off a plate. Use the 3, 4, 5-method. (4 × 3) (12)

[62]

QUESTION 2

2.1 Oxy-acetylene welding processes are useful for welding thin materials. In conjunction with a filler rod, it delivers quite a strong weld. Two methods can be used, namely the leftward welding process and the rightward welding process.

Analyse the TWO processes and make a neat drawing illustrating the leftward welding technique. Label ALL components. Indicate the direction of travel. (15)

2.2 The acetylene and oxygen components differ in the sense that the screw threads are different.

Distinguish between the TWO types of threads by explaining the direction of the threads. (2 + 2) (4)

[19]

QUESTION 3

3.1 Scale drawings are used to illustrate whether a drawing is bigger or smaller on a plan. When a scale is indicated as 1 : 5, it means that 1 real-sized unit represents 1/5 of a unit on the drawing; meaning 5 times smaller.

What will a scale of 5 : 1 represent? (4)

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3.2 During planning for installation, components must be checked according to a drawing. The checklist must provide certain information.

List FIVE pieces of information the checklist must provide. (5)

3.3 Noise can harm your hearing very badly if you do not adhere to the Occupational Health and Safety Act.

What are the maximum decibels one can be exposed to before ear muffs become compulsory? (1)

3.4 Crane drivers have to obey certain rules while working.

State FOUR things that crane drivers should NOT do while using cranes. (4)

3.5 During the lifting process of equipment, crane drivers must rely on hand signals, because communication can create problems and misunderstanding.

Interpret the hand signal given by the assistant in FIGURE 2 below.

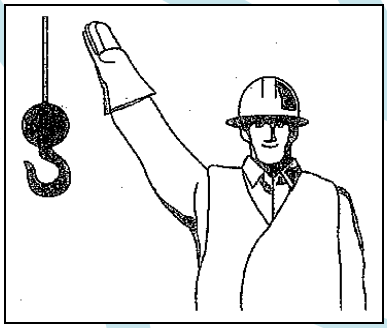


FIGURE 2 (1)

3.6 It is very important that the correct chain sling is used during lifting work.

State FOUR factors to consider when selecting the correct type of chain sling. (4)

[19]

TOTAL: 100

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