higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

NOVEMBER EXAMINATION

MANUAL MANUFACTURING
NQF LEVEL 2

19 NOVEMBER 2014

This marking guideline consists of 10 pages.

QUESTION 1

1.1 Any workplace that places emphasis on the health and safety of its employees will benefit in the long run. Not only does it improve productivity by cutting down on time lost due to injury or ill health, but it also improves workforce moral (3)

1.2 Safety hazards
- Contact with moving parts.
- Contact with electricity, heat, or fire.
- Contact with pressurised gas or liquid.

Health hazards
- Contact with harmful chemicals
- Harmful actions to the environment
- Contact with excessive noise, radiation, or vibration. (6)

1.3
- Oxygen
- Heat
- Fuel (3)

1.4 The purpose of the Occupational Health and Safety Act is to promote the health and safety of all workers, as well as other people that may be affected as a result of work related activities. It protects the rights of employees to a safe and healthy working environment (3)

1.5 An engineering drawing is a type of drawing that is technical in nature. It is used to fully and clearly define requirements for engineered items. An engineering drawing conveys information and instructions relating to the form, proportions, dimensions, material and finish of an object (5)

1.6
- Freehand drawing
- Isometric drawing
- Sectional drawing
- Assembly drawing
- Detail drawing (5)

1.7 The purpose of marking out is to transfer lines from a drawing to a workpiece. The lines are needed on the workpiece to identify the parts of the material that need machining (3)

1.8 Any five of the following are acceptable.
- Clean the measuring faces and workpiece very carefully. Dust, dirt, oil, and grinding chips can cause scratches or cause measuring errors.
- Measuring devices which have been greased must be wiped and cleaned carefully. Dust and fluff stick on greasy surface
- Do not take measurements on rotating workpieces unless! using measuring devices specially intended for such a procedure. This involves serious risk of accidents and cause excessive wear to the measuring device.
- Remove burrs from the measuring face of the measuring device as they damage the workpiece.
- Use a fine hone and work away from the measuring face when deburring an edge. Clean surfaces very carefully after honing.
- Demagnetise measuring devices which, for any reason, have been magnetised. Magnets attract steel particles which may cause measuring errors or deep scratches to the workpiece.
- Smear measuring devices with acid-free, moisture-free Vaseline after use. This is especially important before long periods of idleness such as annual holidays. (5)

1.9
- Workers tripping over objects on the floor.
- Articles falling from above.
- Workers slipping on greasy floors.
- Workers bumping against material which is protrude or stick out because they been badly stacked or badly placed.
- Hands or other parts of the body that are being cut by nails wires which stick out from untidy piles of material or untidy working surface. (5)

1.10 Value and purpose of these signs are to promote safety in work place at all times. (2)

1.11 WW-Warning signs
FB-Fire equipment warning signs
GA- Informative signs
PV- Prohibitive signs
MV- Safety clothes and equipment to be worn (5)

1.12 **Function of the pedestal drilling machine**
The pedestal drilling machine is used to drill holes that require more accuracy than a hand held drilling machine. (2)

1.13 Square files - used to make internal slots and rectangular holes.
Triangular files - used to make sharp internal corners.
Halt round files - used to file large, internal round corners. (3)
[50]

QUESTION 2

2.1. 2.1.1 True
2.1.2 True
2.1.3 False
2.1.4 False
2.1.5 True
2.1.6 False
2.1.7 True
2.1.8 True
2.1.9 True
2.1.10 True
(10 x 1) (10)

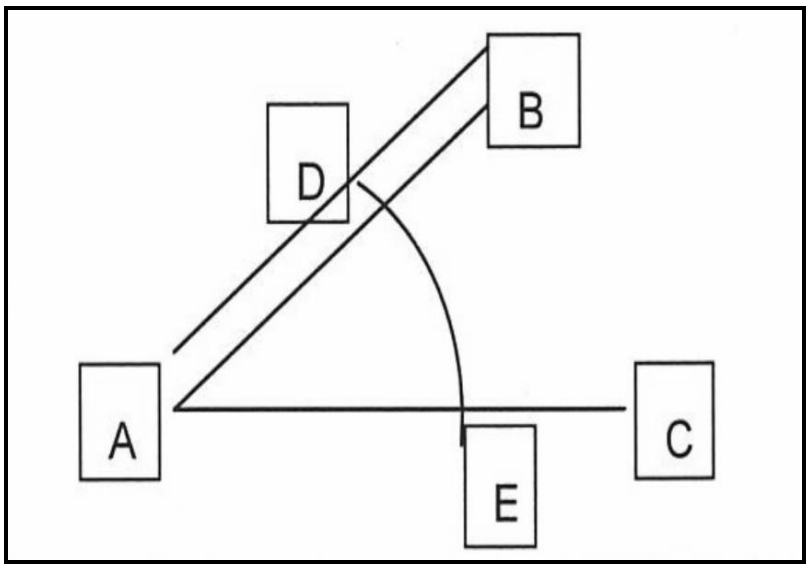
2.2 So as to prevent injury due to falling heavy objects to prevent foot injuries and for non-slip. (1)

2.3
- Steel toe cap
- Non-slip soles
- Chemical resistant soles
- Ankle protection
- Steel inner sole (2)

2.4
- Personal hygiene
- Engineering design or safety machine guards
- Personal protective equipment
- Housekeeping
- Colour coding
- Education
- Safety procedures (2)
[15]

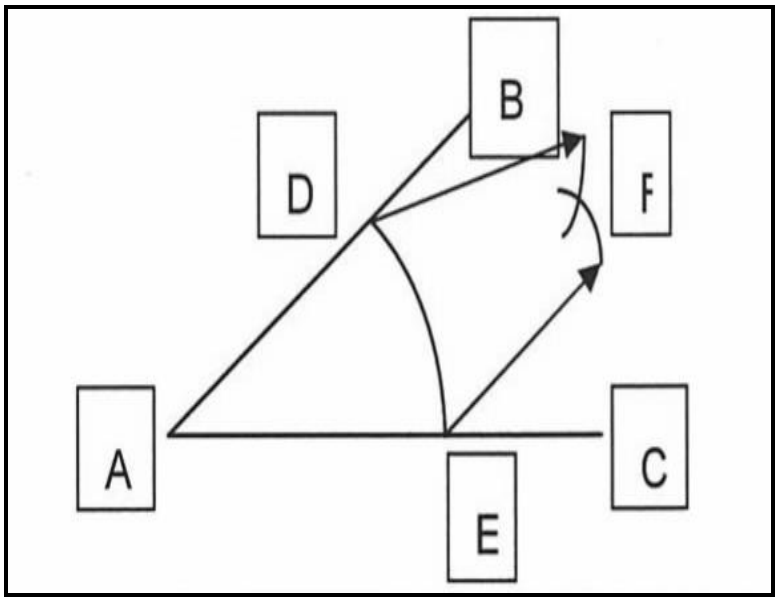
QUESTION 3

3.1. Step 1
For the given angle BAC, draw an arc DE from point A using a compass. You can use any distance from point A to draw the arc.



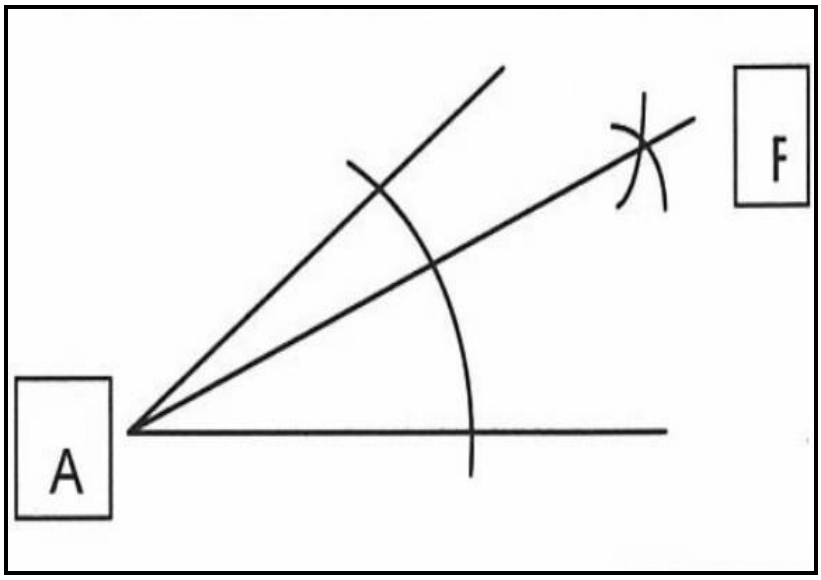
(3)

Step 2
Place the compass point on E and draw an arc with radius of your choice. Repeat this but put the compass point on D. These two arcs should intersect at point F.



(3)

Step 3
Connect point A and F with a line. Now you have bisected an angle.



One mark for explanation and two marks for drawing (3)

3.2 It is used for drawing arcs and circles on paper.
It can be used to bisect angles (1)
[10]

TOTAL SECTION A: 75

SECTION B

QUESTION 4

4.1 **Flexibility -** suitable for cutting mild steel and soft metals, flexible blade are more durable (2)

All hard - very hard high speed steel (HSS) and brittle, work piece to be well secured (2)

Bimetal - HSS cutting edges are welded into carbon steel backing making them the most useful blade, good for almost all applications (2)

4.2
- Abrasive grain
- Fillers
- Bond
- Grain size
- Grade
- Structure (3)

4.3
- Measuring outside diameters.
- Measuring depths.
- Measuring inside diameters.
- Measuring step measurements (3)

4.4 4.4.1 Straight-peen hammer
4.4.2 Ball-peen hammer
4.4.3 Cross-peen hammer
(3 x 1) (3)

4.5. 4.5.1 C
4.5.2 E
4.5.3 B
4.5.4 F
4.5.5 A
4.5.6 D
(6 x 1) (6)

4.6 0.01 (1)

4.7 1. locking lever
2. chuck-holding device for the drill
3. safety guar
4. work table
5. work table lock holding table in position when table height is selected
6. pillar
7. feed handle
8. belt guard (8)
[30]

QUESTION 5

5.1 Prevention against electric shock – check electrical leads for damage
Prevention against radiation – using welding helmets and full body cover
The scattering of hot particles or globules of metal parts – leather protective wear
Flying pieces of slag chipped away from weld – protective welding screens
Heat and fumes – adequate ventilation
Arc rays which can seriously damage eyes – welding helmets, welding screens. Ensure gas bottle regulators are set correctly. (5)

5.2 Semi-permanent patch works.
Jewellery components.
Copper pipe connections.
Sheet metal objects joints.
Assembling electronic components to printed circuit boards (PCBs).
Small mechanical parts.
Stained glass work for joining copper foil and lead to form a frame for the glass layout.
Joining of electrical cables. (3)

5.3 Tinning refers to coating components or wires with solder prior to making the joint (2)

5.4 To tin the tip:
Begin by heating the tip until it will melt the solder.
Rub some solder onto the hot tip and spread the molten metal over the surface. When this is properly done, the tip will have a bright, shiny silver appearance. If the tip is too hot, the copper tip will tarnish. When this happens, allow the tip to cool slightly before tinning.
The size of joint to be soldered, also called the tip size.
The heat needed to solder the joint without damaging other (5)

5.5 Check the handle for cracks.
The handle must be secured to the soldering iron.
Check the electrical cord for cracks, burn marks and connections.
Check the plug for loose connections and damaged
Never use a soldering iron while standing in water (3)

5.6 Gas-welding
1. Oxygen hose line
2. Acetylen cylinder
3. Acetylen tank
4. Valve
5. Nozzle
6. Oxygen tank
7. Regulator (7)

[25]

QUESTION 6

6.1 Refer to (ADDENDUM A). (10)

6.2
6.2.1 Report to maintenance and supervisor and put warning signs
6.2.2 Remove them if can and report to supervisor
6.2.3 Report it and write faulty tool report
6.2.4 Clean it safety its every body's responsibility
6.2.5 Ask for help

(5 x 1) (5)

6.3
- Triangle
- Circle
- Square

(3)

6.4
- Sliding plates
- Bearings
- Bolts and nuts
- Gears
- Trolley wheels
- Fan blades

(2)
[20]

ADDENDUM A

QUESTION 6.1

WORK PLAN					
Name:					
Name of task:					
Start Date:			**End Date**		
Bill off materials					
Part Name:	**No**	**Material:**	**Size:**	**Unit Cost:**	**Total Cost:**

Procedural plan

List all the operations to be performed in the correct sequence and list the tools and equipment needed to complete the task according to the plan

Item	**operations**	**Tools and equipment**
1	Scribing lines	Scriber
2	Punch holes where going to drill	Center punch
3	Drill holes	Drilling machines with the write size drill bits
4	Removing rough edges	file
5	Engineering square	check for squarenes

TOTAL SECTION B: 75
GRANDTOTAL: 150