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higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

APRIL EXAMINATION

WOODWORKERS THEORY N1

30 March 2016

This marking guideline consists of 6 pages.

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QUESTION 1: INTRODUCTION TO THE BUILDING INDUSTRY AND PRODUCTIVITY

1.1
- Productivity is getting more out of what you have put in.
- It is doing better with what you have. (2 × 1) (2)

1.2 $\text{Productivity} = \frac{\text{Output}}{\text{Input}}$ ✓✓✓ (3)

1.3
- Product or service design
  Some things are easier to make or deliver than others.
- Plant and equipment
  Up-to-date and well maintained facilities and equipment make a big difference in productivity.
- Mechanisation
  The introduction of automation, computer control, robots, and the like increases speed, precision and efficiency.
- Process layout and method
  Congestion and backtracking hinder productivity; order and unimpeded flow accelerate it.
- Conditions of material
  Pre-sorted and stacked parts speed machine loading. Carbonless forms with pre-printed routing instructions improve typing efficiency.
- Extent of power usage
  Electricity, steam, compressed air and fuel all apply leverage to human effort. (Any 5 × 2) (10)

[15]

QUESTION 2: SAFETY AND HOUSEKEEPING

2.1
2.1.1 True
2.1.2 False
2.1.3 True
2.1.4 False
2.1.5 True

(5 × 1) (5)

2.2
- Inspect the wiring of the equipment before each use.
- Replace damaged or frayed electrical cords immediately.
- Use safe work practices every time electrical equipment is used.
- Know the location of shut-off switches and/or circuit breakers and how to operate them. Use these devices to shut off equipment in the event of a fire or electrocution.
- Limit the use of extension cords. Use them for temporary operations only.
- Only use multi-plug adaptors equipped with circuit breakers or fuses.
- Minimise the potential for water or chemical spills on or near electrical equipment. (Any 4 × 1) (4)

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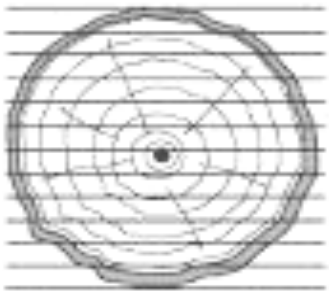
2.3
- Hard hats and helmets to protect your head from falling objects.
- Earplugs and ear muffs for your ears.
- Safety boots, foot protectors and shoes to protect your feet.
- Gloves, mittens and gauntlets for your hands.
- Glasses, goggles, face shields, visors and strengthened prescription lenses for your eyes.
- Face masks, respirators, air-line breathing apparatus for your lungs.
- Aprons, suits, jackets and overalls for your body.
- Spats, leggings and aprons for your legs. (Any 3 × 2) (6)

[15]

QUESTION 3: TIMBER, TIMBER PRODUCTS, METAL AND GLASS

3.1

Quartered conversion
2 different cuts (radial boards)



Through and through conversion
(tangential and some radial boards)

Tangential cuts
(heart is boxed

(3 × 3) (9)

3.2
- Natural seasoning
- Artificial seasoning (2)

3.3 Creosote (1)

3.4
- Regarded as more economical than the full cell method.
- Cells are not overfilled but lined with the preservatives.
- The bleeding is less wasteful.
- The timber dries out quicker than in the full cell method. (Any 3 × 1) (3)

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3.5
- Type and size of the saw machine
- Size and diameter of the log
- Condition of the log
- Species of timber
- Economic reasons
- End use of the cut timber or purpose for which the wood is to be used.

(Any 5 × 1) (5)

QUESTION 4: TOOLS AND MACHINES

4.1 4.1.1 Handle

4.1.2 Switch

4.1.3 Speed control

4.1.4 Shoe

4.1.5 Blade

(5 × 1) (5)

4.2 They are all used for marking-out purposes. (1)

4.3 4.3.1 Crosscut saw

4.3.2 To cut across the grain of the timber.

4.3.3 7 to 8 teeth per 25 mm

(3 × 1) (3)

4.4 Pneumatic tools are tools that are operated by compressed air. (1)

4.5
- Review the manufacturer's instructions before using the tool.
- Wear safety glasses, goggles, or a face shield, safety shoes or boots and hearing protection where necessary.
- Post warning signs where pneumatic tools are used. Set up screens or shields in areas where nearby workers may be exposed to flying fragments, chips, dust and excessive noise.
- Ensure that the compressed air supplied to the tool is clean and dry. Dust, moisture and corrosive fumes can damage a tool. An in-line regular filter and lubricator increases the tool's lifetime.
- Keep tools clean and lubricated and maintain them according to the manufacturer's instructions.
- Only use attachments that the manufacturer recommends for the tools you use.
- Be careful so as to prevent hands, feet or the body from injury in case the machine slips or breaks.
- Reduce physical fatigue by supporting heavy tools with a counter-balance wherever possible. (Any 5 × 1) (5)

[15]

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QUESTION 5: FIXATIVES, GLUE AND FITTINGS

5.1
- It is suitable for indoor or outdoor use and is highly durable.
- Some brands of polyurethane adhesives guarantee the bond to last as long as the materials that are being joined together.
- It is applied straight from the container and doesn't need to be mixed.
- Most varieties of polyurethane glue can be painted over.
- The strong adhesive factor stems from its foaming action, as it expands when it cures and comes into contact with moisture. (Any 3 × 1) (3)

5.2
- Unless the material already contains a small percentage of water vapour, a light misting or sprinkling of water on one of the surfaces that are to be glued may be necessary in cases of wood.
- It will not bond to plasticised PVC, bituminous surfaces, certain rubbers and plastics such as polyethylene, polypropylene, and teflon.
- It is not suitable for permanently submerged/underwater applications.
- It is not suitable as a structural adhesive.
- Like other glues polyurethane glue has a limited shelf life of generally 6-12 months.
- It's also worth remembering that since this type of glue reacts with moisture, it will also react to the moisture on the skin. Therefore it's a good idea to wear gloves when working with it. (Any 3 × 1) (3)

5.3
5.3.1 It is used on plaster ceiling boards, roof felt and to nail thin fibre cement sheetings.

5.3.2 It is mostly used for construction carpentry.

5.3.3 It is mostly used for nailing floorboards to a joist.

(3 × 1) (3)

5.4
- Fixing structural sections to concrete
- Fixing sign boards
- Staircase balustrades
- Turnstile rails (Any 2 × 1) (2)

5.5
- The edges of the biscuit must be sanded smooth for easy handling and insertion.
- The surface must be gridded to facilitate uniform glue spreading.
- The ends must be flat so that the surplus glue remains inside the grooves.
- The length and thickness must be exact.
- It should have a high breaking strength and finely ground edges.
- Lamella biscuits must have a moisture content of 9% with a tolerance of about 1% and a thickness tolerance of 4 mm. (Any 4 × 1) (4)

[15]

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QUESTION 6: JOINTS

6.1 6.1.1 Haunched mortise and tenon joint
Mostly used in furniture and indoor cabinet work.

6.1.2 Common or through dovetailed joint
Used in boxes, carcass constructions, fronts and backs of drawers.

6.1.3 Mitre joint
Joining of timber and forming internal and external corner joints.

6.1.4 Corner halflap joint
Used to construct light frames, furniture bases, carcasses and wall plates for roofs.

6.1.5 Finger joint
Joining of timber for structural and non-structural uses and to join two pieces of timber.

(5 × 2) **[10]**

QUESTION 7: BUILDING RELATED CALCULATIONS

7.1 Cost of wood for 2 bedroom cupboards = 0,4 m³ x R 6 000 × 2 ✓✓
= R 4 800 ✓✓
(4 × 1) (4)

7.2 Labour for 2 bedroom cupboards = R 120 × 3,5 hours × 2 cupboards ✓✓
= R 840 ✓
(3 × 1) (3)

7.3 Add 30% profit = (R 4 800 + R 840) × 30%
= R 5 640 × 30%
= R 1 692 ✓

Total cost for two bedroom cupboards = R 4 800 + R 840 + R 1 692 ✓
= R 7 332 ✓
(3 × 1) (3)
[10]

TOTAL: [100]

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