



## CHIEF MARKER'S REPORT

<b>SUBJECT:</b>	<b>CIVIL TECHNOLOGY</b>
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### 1. ANALYSIS OF QUESTION BY QUESTION PERFORMANCE

#### QUESTION 1

Knowledge of construction processes was tested in this question with emphasis on (1) use of specialized tools, (2) safety and (3) general construction

LO: 1: Ass: 1.1

LO: 2: Ass: 2.3

LO: 3: Ass: 3.3, 3.7

LO: 4: Ass: 4.10

#### 1.1 Choosing of a word to match description in column:

It was answered well. Learners must match ALL the numbers, even when they are not sure about the correct correlation,

#### 1.2 Parts and use of dumpy level

Well answered. Learners must distinguish between the eye piece (in front of the dumpy level) and the objective lens. (on the back side)

Concentrate on the correct names of the parts of the dumpy level.

The **telescopic staff** is used for taking readings with the dumpy level, not the measuring rod. (used in bricklaying)

This section on equipment is a revision of grade 10 work, and therefore must also be taught in grade 12 as per work schedule.

#### 1.3 Drawing of arches

Learners must put more emphasis on the placing of the bricks in the arch. Line sketches must also be drawn neatly.

#### 1.4 First aid to an injured worker – steps to stop the bleeding

A number of answers did not relate to the question. Learners must read the questions thoroughly and determine the important or applicable fact/word of the question. Teachers can inculcate this by using scenario type of questions.

## QUESTION 2

Knowledge of advance construction processes was tested in this question with emphasis on (1) formwork, (2) concrete work, (3) brickwork and (4) steel reinforcing.

LO: 3: Ass: 3.1, 3.5, 3.7

### 2.1 True or false – construction processes

This question was adequately answered indicating a good knowledge of general construction processes

### 2.2 Spacers for reinforcement in formwork

A variety of descriptions were written by the candidates. Emphasis must be on the **correct** names for the different types of spacers.

### 2.3 + 2.4 Short-bored pile and pre-cast concrete pile

Candidates are familiar with pile foundations but did not answer this question very well. The different construction methods and advantages must also attended to. Teachers must use other books as resources if the topic is not fully covered in the book that they are using.

### 2.5 Wall cladding

Adequately answered indicating a good knowledge of cladding material. Paint and plaster are not cladding materials.

### 2.6 Materials for constructing of dry-wall frames

This question was adequately answered but learners must attend to the following:

- plastic and concrete are not used for the framework of dry-walls.
- the framework must be of a firm solid material which will be clad with a type of sheet.

### 2.7 Drawing of a cross junction of a one-brick wall in English bond.

The English bond is not used generally, therefore this type drawings must be practiced repeatedly. It can also be imprinted by means of practical tests by using wooden blocks or loose bricks to simulate the different brick bonds.

### 2.8 Parts of the formwork for a round concrete column

The purpose of props in formwork must be attended to.

### **QUESTION 3**

Knowledge and application of civil services was tested in this question with emphasis on (1) lay-out of sewerage systems, (2) abbreviations and symbols and (3) renewable energy.

LO: 3: Ass: 3.8

LO: 4: Ass: 4.5

3.1.1 – 3.1.7 Lay-out of a one-pipe sewerage system.

Learners must attend to the following:

- Diameter of drainage pipe = 110mm outside measurement(100mm inside)
- Gradient of sewer pipe = 1:40 standardized, but can be up to 1:60 in specific situations.
- All pipe connections are 45°.

3.1.8 Identify symbols

WC – water closet, not a toilet. A toilet is the structure/building/room in which the water closet, bath and shower is.  
(Afr. Spoeltoilet/spoelkloset/watertoilet)

3.2 Installation of solar panels

Attend to the specific installation requirements related to solar panels. Teachers must accent the difference between advantages, uses and installation methods.

3.3 Advantages of wind power

Adequately answered

3.4 Sketches of electrical symbols

Line sketches must be drawn neatly in pencil.

### **QUESTION 4**

The skill to draw up a cutting list and knowledge of materials was tested in this question with emphasis on (1) wood, (2) joining methods (3) cement/concrete and (4) metals.

LO: 3: Ass: 3.7, 3.9

LO: 4: Ass: 4.9

4.1 Choosing the correct answer - materials

Adequately answered. Attend to timber properties and uses.

4.2 Completing of a cutting list for a cupboard.

When the length of the shelves are determined, candidates must subtract the thickness of the 2 sides of the cupboard.

4.3 Cube test.

Learners must concentrate on the correct names of the apparatus needed to prepare a cube and the standard size of a cube.

The concrete tests are an important part of the curriculum and teachers must therefore accent to the methods of preparing the tests, apparatus used and purposes.

4.4 Use of aluminium window frames

Adequately answered. The properties of aluminium are well known but attend to the costs – it is not cheap.

4.5 Fastener for timber roof truss parts

Well answered.

Gusset plate or plate cannot be used as a fastener.



## QUESTION 5

Understanding of applied mechanics principals was tested in this question with emphasis on (1) force diagrams, (2) calculating areas, (3) centre of a lamina and (4) strain.

LO: 3: Ass: 3.6

### 5.1 Force diagram of a cantilever roof truss.

Emphasis must be on the accuracy of the force diagram and that the angles of the parts in the force diagram must be the same angle as that in the space diagram. A number of learners got confused to determine the nature of the forces in the parts. Teachers must accent that when a part is under compression, it is a strut (arrows pointing outwards) and when it is under tensile stress, it is a tie. (arrows pointing inwards)

### 5.2.1 Calculations of areas.

A number of candidates had done the calculations incorrectly, although the formulas were provided. Teachers must firstly teach the learners the meaning of each formula and than how to apply it according to the values. Learners must indicate the **units** of the answers. Learners must be taught to use the same unit size through-out the calculation.

### 5.2.2 Calculate the position of a centroid.

When there is a hole in a figure, the area of the hole must be subtracted from the area of the figure to find the total area.

### 5.3 Calculate the stain of a steel rod.

Strain does **not** have a unit because it is a ratio.

These learners must be taught how to use the provided formulas. Teachers must accent that the same unit size must be used through-out the calculation.

## QUESTION 6

The skill to communicate by means of graphic communication was tested in this question with emphasis on interpretation of building drawing practice in (1) analysing of a site plan and (2) drawing of elevation drawings

LO: 3: Ass: 3.4

LO: 4: Ass: 4.4

### 6.1 Analyzing of a site plan

Generally the question was answered well.

Attention must be paid to the calculating of the total area of the house, perimeter of the building and colour codes.

These calculations can be incorporated in the PAT projects.

Attend to the spelling of manhole – not main hole

6.2 Drawing of the north elevation  
Determining of roof height was not answer well. This method must be accented in PAT projects.  
Noting of the window sills and door steps are important.  
Teachers must emphasise the Building Drawing Practice requirements.  
Building drawings must be done in pencil.  
Using the correct scale must be emphasized.  
When drawing elevations, 3d angle projection must be used. (Door on the correct side of the structure)  
A number of learners did not label the drawing as was specified. Learners must study the question to ensure that nothing was left out.

**7. ANY ADVICE THAT YOU COULD GIVE TO EDUCATORS TO HELP LEARNERS TO REACH THE EXPECTED LEVELS**

1. Fixation of graphic communication must be done in conjunction with the PAT projects. Learners must be taught to do scale drawings.
2. Applied mechanics must be done by means of repetition. Attend to basic mathematical skills and use basic problem solving questions.
3. Revision must be done regularly.
4. More emphasis should be given to the construction parts and purposes. The definitions of terms must be mastered by the learners to apply it more successfully in scenario questions.
5. Follow the examination guideline for year planning.
6. Variations in construction methods must also be explained to learners.
7. When scenario questions are answered, the learners must read it thoroughly and determine the important or applicable fact/word of the question.
8. Exemplars and provincial papers can be used in preparation of the final exam, but not in isolation. Revision is also very important.
9. Expose learners to the practical application of construction work.

**8. ANY OTHER COMMENTS**

As last year a number of examination centres indicate poor knowledge of the subject, especially in materials, civil services, determining of quantities, applied mechanics and graphic communication questions.

When teachers have a content knowledge gap, they must study at least the text book and must prepare the work for every lesson.

Subject advisers must be contacted for assistance.

The mathematical skills of learners must attend to by means of repetition and working through examples.