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NSC 2011 CHIEF MARKER'S REPORT

SUBJECT	CIVIL TECHNOLOGY

PAPER	1

DATE OF EXAMINATION:	24 / 11 / 2011	DURATION:	3 HOURS

SECTION 1:

(General overview of Learner Performance in the question paper as a whole)

A variety of performances was obtained in the 2011 question paper.
A couple of centres obtained good to very good results. Although the paper was set up reasonably fair, a large number of centres perform poorly to very poorly.
Many candidates obtained high marks in some questions but scored less marks in other questions. There are, but few those who managed to make it throughout the whole question paper.
In analyzing the type of answers in the papers of the centrums who performed poorly, it indicates to a knowledge gap in especially advance construction processes, materials, quantities, applied mechanics and graphic communication. These challenges could be caused by not enough fixation of work, poor mathematical skills and insufficient guidance.
The averages per question:
Q.1: Construction processes: 36%
Q.2: Advance construction processes: 25%
Q.3: Civil services: 32%
Q.4: Materials and quantities: 23%
Q.5: Applied mechanics: 26%
Q.6: Graphic communication: 38%
The higher average of graphic communication was mainly attributed by the very high performance by a couple of high performing centres.
As a whole, the learner performance in this question paper was very unsatisfactory with an average mark of 30% and 48,7% in a code rating 1.

SECTION 2:

Comment on candidates' performance in individual questions
(It is expected that a comment will be provided for each question on a separate sheet).

QUESTION 1
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
(c) Provide suggestions for improvement in relation to Teaching and Learning
(d) Describe any other specific observations relating to responses of learners
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

Knowledge of construction processes was tested in this question with emphasis on the (1) use of specialized tools, (2) safety and (3) general construction
LO: 3: Ass: 1, 2, 4, 5, 7, 10

1.1.1 Identify safety equipment:
(a) With illustrations which are clear and unambiguous, this question was adequately answered indicating a good knowledge of safety equipment.
(d) Learners must note that earphones are not ear protection.

1.1.2 Use of equipment:
(b) Although the question clearly stated "Name ONE specific instance where you will use the equipment in A, B and C respectively." a number of learners indicate only 1 general use for all the safety equipment.
(c) Learners must read the questions thoroughly. Find the important or implication word in the question.
Ex: "Name ONE specific instance where you will use the equipment in A, B and C respectively."
The applications words will be: **specific instance; use** and **A, B and C respectively**.

1.2 Safety – external bleeding:
(a) This question was adequately answered indicating a good knowledge of safety.

1.3 Match column A with column B – general construction:
(b) The meaning of the word "sustainability" was not clear to all the learners.
(d) Learners must match the most suitable answer to each number. Therewith, unknown word matches can be answer by eliminating the wrong descriptions.
(e) Teachers can develop this method by using "column matching" questions in class tests. At the same time knowledge and insight will be developed.

1.4 Drawing of flat gauged arch:
(a) This question was poorly answered.
(b) Most of the learners who attempt this question, drawn the wrong arch.
(c) Teachers must put more emphasis on the construction methods of the different types of arches.
(d) The same support construction of soffit boards, props and struts are used for building all types of arches,
(e) Line sketches must also be drawn neatly and in pencil.

1.5 Explain method to obtain shaped bricks:
(a) Adequately answered by the learners who manage to answer Q.1.4.

1.6 Identify joint:
(a) Poorly answered. Although the half lap joint is a well known joint, a large number of learners could not identify it correctly.
(c) Teachers must explain the logic correlation between the name and the construction of the different joints.

QUESTION 2

(a)	General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
(b)	Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
(c)	Provide suggestions for improvement in relation to Teaching and Learning.
(d)	Describe any other specific observations relating to responses of learners.
(e)	Any other comments useful to teachers, subject advisors, teacher development etc.

Knowledge of advance construction processes was tested in this question with emphasis on (1) symbols, (2) brickwork, (3) ground work, (4) roof construction, (5) dry wall, (6) concrete work, (3) dumpy level and (4) scaffolding.
LO: 3: Ass: 3, 4, 5, 7

2.1 Sketch of basement wall:
(a) Candidates are familiar the construction method of a basement wall but did not answer this question very well.
Learners must attend to the following:

2.1.1 Position of DPC:
(b) Top DPC in wall must be at least 150mm or 2 brick thicknesses above NGL.
The wall DPC cannot be placed on the outside of the wall, because it will decay.
The floor DPC must be directly underneath the floor and above the blinding.
The purpose of the blinding is to protect the DPC from being penetrated by sharp objects in the hard core filling.

2.1.2 Screed draw and symbol:
(a) A number of learners did not know the correct symbol for screeds.
(e) The national SANS document must be part of the study material.

2.1.3 Drawing of plaster:
(d) Thickness ± 10mm.

2.1.4 Earth filling symbol:
(a) A number of learners could not differentiate between earth filling and disturbed soil.
(e) The national SANS document must be part of the study material.

2.1.5 Abbreviation for natural ground level:
(a) Well known abbreviation. Adequately answered

2.1.6 Concrete symbol:
(a) Well known symbol. Adequately answered.

2.1.7 Hard core filling symbol:
(a) A number of learners did not know the correct symbol for hardcore filling.
(e) The national SANS document must be part of the study material.

2.1.8 Wall thickness:
(c) 220mm: 230mm when plaster is included.

2.2 Sketches of batten and purlin with measurements:
(a) A variety of answers was obtained.
(b) Measurements was not indicated and learners could not differentiate between a batten and a purline.
(c) Learners must read the questions thoroughly.
Also differentiate between the 38x38mm **batten** for tiles and the 50x76mm **purline** for sheets.
(e) Teachers must put emphasis on the standard timber sizes. E.g. 38x38, 38x50, 38x76, 50x76, etc.
Purlines are larger than battens because they are used for fixing sheet covering by means of roof nails.

2.3 Comparison between dry wall and brick wall:
(a) Although this question was adequately answered, a number of marking centre's learners did not know the term "drywall".
(c) Teachers must attend to all wall construction methods.

2.4 Types op piling and Circumstances requiring piles:
(a) This question was not adequately answered.
(b) A number of learners did not know the term "pile foundation".
(c) Variations in construction methods must also be explained to learners.
(e) When adequate information is not in the text book used by the learners, other source material must be duplicated.

2.5 Calculate height difference – dumpy level:
(a) Adequately answered.
(d) Learners must indicate the **unit** for the answer.

2.6 Identify abbreviations in collimation table:
(a) This question was poorly answered indicates lack of knowledge of collimation tables.
(c) When teachers cover this part of the work, the completion of the tables must be done in correlation with the use of the dumpy level.

2.7 Discus factors to ensure efficient placing of ready-mixed concrete:
(a) This question was not adequately answered.
(b) Although the question clearly stated "…placing of concrete is carried out efficiently…" a number of learners described concrete mixing, curing, etc.
(c) Learners must read the questions thoroughly
(d) The type of answers received, indicates sufficient knowledge of concrete work in General, but was not applicable to the question.

2.8 Types and uses of scaffold:
(a) Adequately answered.
(b) Although a number of learners did not indicate the correct names for the scaffold types, they did a description of it and name the correct uses.
This indicates good general knowledge of scaffolding.

QUESTION 3
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
(c) Provide suggestions for improvement in relation to Teaching and Learning
(d) Describe any other specific observations relating to responses of learners
e) Any other comments useful to teachers, subject advisors, teacher development etc.

Knowledge and application of civil services was tested in this question with emphasis on (1) lay-out of sewerage systems, (2) abbreviations and symbols, (3) septic tank and (4) renewable energy.
LO: 3: Ass: 5, 8

3.1 Illustration of sewerage system is clear and unambiguous.

3.1.1 Names of parts:
- (a) Adequately answered.
- (d) Learners must be able to differentiate between the structure, placing and use of a "sink" and a (hand) basin

3.1.2 Pipe diameter:
- (a) Adequately answered.
- (d) Inside diameter is 100mm.

3.1.3 Pipe diameter:
- (a) Adequately answered.
- (e) A 1:40 slope indicates a ratio of 40 units horizontally and 1 unit vertically.

3.1.4 Purpose of trap:
- (a) Not adequately answered.
- (b) It is not a connection between the sanitary fitting and the waste pipe. It is structured in such a way – the bend – that it keeps a water lock to prevent foul gasses and smells from entering the building.
- (c) Teachers must put more emphasis on the purposes and the different types of traps.

3.1.5 Name pipe:
- (a) Not adequately answered.
- (b) Down pipes are rain water pipes connected to the gutters on the roof. The soil pipe is connected to the water closet. (toilet)
- (c) To differentiate between the types of pipes teachers can use sketches or real structures for identification.
- (d) The waste pipe is connected to sanitary fittings such as sinks, basins, baths and showers as indicated in the figure.

3.1.6 Name pipe:
- (a) Adequately answered.

3.1.7 Gradient of pipe:
- (a) Not adequately answered.
- (b) A number of learners indicate the gradient of pipe connections.
- (c) Teachers must explain the method of determining the gradient of sewer pipes. If the gradient is for example 1:40, it means it is 40 units horizontally and 1 unit vertically.

3.2 Working of septic tank:
(a) A number of marking centers did not relate to the question.
(b) Answers indicate the construction working of water tanks.
(c) Teachers must attend to this by instructing the learners to do the description of the working of a septic tank in conjunction with the drawing.

3.3 Advantages of hydro-electricity:
(a) Adequately answered.
(b) A number of learners describe what hydro-electricity is and how it is obtained.
(c) Teachers must accent the difference between advantages, uses and installation methods.

3.4 Advantage of desolation of sea water:
(a) Adequately answered:
(d) Learners must differentiate between “advantages” and “working or description”.

3.5 Advantage of gas water heaters:
(a) Adequately answered.
(d) Learners must differentiate between “advantages” and “working or description”.

3.6 Explanation of service abbreviations:
(a) Adequately answered.

3.7 Give service abbreviations:
(a) Adequately answered.
(d) The SANS abbreviation for shower is “S”, not “SW”.

3.8 Identify traps:
(a) Adequately answered.
(b) Although these are well known figures, a number of learners could not identify the traps correctly, indicating U-trap or V-trap.
(c) Teachers must explain the resemblance of the shape of the trap to it’s name.

QUESTION 4

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

(c) Provide suggestions for improvement in relation to Teaching and Learning

(d) Describe any other specific observations relating to responses of learners

e) Any other comments useful to teachers, subject advisors, teacher development etc.

The skill to calculate materials and quantities and knowledge of materials was tested in this question with emphasis on (1) calculation of lengths and areas, (2) wood, (3) joining methods (4) preservatives and (5) metals.
LO: 3: Ass: 2, 3, 7, 8

(c) Teachers must put more emphasis on the use of units as an integral part of the answer.
(d) Although the calculations in this question was mostly done correct, a number of learners did not indicate the units.

4.1.1 Calculate inside length and width:
(a) Well answered question.
(b) In determining the inside length, the thicknesses of **both** walls must be subtracted.

4.1.2 Calculate area of garage:
(a) Adequately answered.
(d) The formula to calculate an area is well known and was indicated in the formula sheet.
Some of the learners did not subtract the walls to calculate the inner area.

4.1.3 Calculate area of ceiling board:
(a) Adequately answered indicating good knowledge of the implementation of the formula for area.

4.1.4 Calculate number of ceiling boards:
(a) Adequately answered.

4.1.5 Calculate length of cornice:
(a) A number of learners did not answer this question adequately, although the given information was obvious.
(c) This problem can be addressed by incorporate this type of calculations in PAT projects or when quantity work is discussed.

4.2 Compare properties of lead and mild steel:
(a) Not adequately answered.
(b) The properties of lead is was not well known.
In Afrikaans answers the word “duursaam” (durable) does not mean “duur”. (expansive)
(d) Attend to the costs – lead is not cheap and the cost is not a property.

4.3 Calculate length of parts – cabinet:
(a) Not adequately answered.
(b) Learners used the outer measurements to indicate the inner measurement.
(d) When the length of the top and bottom is determined, learners must subtract the thickness of the 2 sides of the cupboard.

4.4 Methods to prevent mild steel from deteriorating
(a) Well answered.

4.5 Joining agents:
(a) Adequately answered.
(d) More emphasis must be put on the different type of nails and their uses.

4.6 Reasons to treat timber with preservatives:
(a) Well answered.

QUESTION 5
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
(c) Provide suggestions for improvement in relation to Teaching and Learning
(d) Describe any other specific observations relating to responses of learners
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

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: 5, 6

5.1 Determine areas and centroid

(a) A number of candidates had done the calculations incorrectly, although the formulas were provided.

(c) Teachers must firstly teach the learners the meaning of each formula and than how to apply it according to the values.
Learners must be taught to use the same unit size through-out the calculation.

(d) Learners must indicate the **UNITS** of the answers.
The centroid of the triangle must be determined from the right-angle

5.2 Force diagram:

(a) Not answered adequately.

(b) A number of candidates did not attempt this question or indicate poor knowledge of force diagrams.
A number of learners got confused when determine the nature of the forces in the parts.

(c) 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.
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)
Applied mechanics must be done by means of repetition. Attend to basic mathematical skills and use basic problem solving questions.
Revision must be done regularly.

5.3 Calculate reaction force

(a) Adequately answered.

(c) Learners must indicate the **UNITS** of the answers.

(d) When the force of a distributed load is determined, the force/m must be multiplied by the total length of the distributed load.
When determining it's downwards force, the distance from the support to the middle of the distributed load must be used in the calculation.

(e) 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.

QUESTION 6
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
(c) Provide suggestions for improvement in relation to Teaching and Learning
(d) Describe any other specific observations relating to responses of learners
e) Any other comments useful to teachers, subject advisors, teacher development etc.
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 building construction parts and (2) drawing of elevation drawings LO: 3: Ass: 5, 6 6.1 Analyze building drawing parts (a) Adequately answered indicating a good knowledge of the parts of a building. (d) Learners must note that the diagonal parts that brace the roof truss are called struts, not braces. 6.2 Drawing of the north elevation (a) Not answered adequately. (b) A number of learners got confused with the direction of the north arrow or did not consider it in determining which side is the west elevation. Determining of roof height was not answer well. (c) Teachers must accent the use of the north arrow and ddetermining of roof height when building drawing projects are done. Teachers must emphasise the Building Drawing Practice requirements. Using of the correct scale must be emphasized. (d) Noting of the window sills and door steps are important. Building drawings must be done in pencil. (e) In schools where EGD is not compulsory, building drawing skills must be emphasized in building drawing projects.

SIGNATURE OF CHIEF MARKER: _____