2010 CHIEF MARKER PUBLICATION REPORT ON MARKING

INSTRUCTIONS FOR COMPLETION

1. The report on marking is a comprehensive report that will serve the following three objectives:
   a) Provide an evaluation of the question paper and marking guideline.
   b) Provide an in-depth analysis of the nature of learner responses, which will facilitate feedback to teaching and learning.
2. This report must be completed by the **CHIEF MARKER in conjunction with the senior markers.**
3. The report must be completed in detail and single word responses will not be accepted.
4. Where additional space may be required, use a separate page which must be appended to this report.
5. The final report must be approved and signed by the Head of Examinations in the province.
6. The report must be submitted to the responsible WCED official at the marking centre.

SUBJECT		**ELECTRICAL TECHNOLOGY**	
PAPER		**1**	
GRADE		**12**	**DURATION OF PAPER : 3 HOURS**
PROVINCE		**WESTERN CAPE**	
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PART ONE: EVALUATION OF QUESTION PAPER AND MARKING GUIDELINE

1. COMMENTS ON SPECIFIC QUESTIONS. (SEE PART TWO QUESTION 1 AND 2 OF THIS DOCUMENT)
Question 1: Generally well answered, but candidates must be able to distinguish between Renewable & Non-Renewable energy sources.
Question 2: Generally well answered.
Question 3: Q3.1 Candidates misunderstand the question. The question was what impact HIV has on the productivity in the workshop. NOT on how to prevent HIV. Teachers should bring this to their attention. Q3.4 Teachers should note the difference between unsafe CONDITIONS and unsafe ACTS in the workshop. Q3.5 Too many candidates do not realize that safety in the workshop is their responsibility too.
Question 4: Q4.1 Many candidates did not know the function of the kilowatt-hour meter. Q4.4 Candidates were asked to draw a phasor diagram, not waveforms. NB: it is important to indicate the anti-clockwise rotation of a phasor diagram. Q4.5 The application of the formula was problematic for many candidates. Many candidates got the substitution of the power factor incorrect. (Candidates try to calculate Cos 0.85 instead of simply inserting 0.85 into the formula))
Question 5: Q5.3 It is unforgivable if candidates in grade 12 do not know the difference between milli, micro, kilo and mega. Many candidates only substitute the value without the pre-fix into a formula, resulting in incorrect answers. Too many candidates cannot operate their calculators correctly, eg. they don't know where to insert brackets in the formula, to arrive at the correct answer. Q5.4 Some candidates struggled to draw the graphical representation of the current and voltage for the circuits given in this question.(It must be wave forms and not phasor diagrams)

Question 6: Q6.1 Candidates cannot interpret the characteristic curve of the SCR and don't know what happens on all the important points on the characteristic curve. More time must be spent when teaching the interpretation of characteristic curves. Q6.2 & 6.3 Candidates must know how to properly switch a SCR on and off. A SCR is not switched on only by putting a trigger pulse on the gate. The anode and cathode must also be properly biased. Q6.3 The operation of the SCR/TRIAC as light dimmer is problematic for the majority of candidates. Candidates do not know the function of the circuit and hence the function of each component.
Question 7: This question was answered the poorest of all. Most candidates are not familiar with this work. In many cases no attempt was made, and where an attempt was made we could see the candidates literally did not know anything. Teachers should give more attention to this section of the work with specific reference to the questions in the paper.
Question 8: Q8.3 Candidates did not know why laminated plates are used in the core of a transformer. Q8.5 The calculations of a transformer regarding its voltage, current and turns ratio must be done with PHASE values. This has been a common error over the last few years, including this year, and must be addressed.
Question 9: In general the drawing of ladder diagrams needs attention. Q9.4 & Q9.5 Few candidates understood what a PLC uses as inputs, outputs and internal functions. This section of the syllabus clearly needs more attention and clarification. Q9.6 Too many candidates did not know how to draw a logic circuit from a Boolean Expression. Also, a logic circuit without labeled inputs is meaningless.
Question 10: Q10.1 Candidates did not understand the purpose and the operation of a star-delta starter. Q10.2 With regard to the rotation of three phase motors, the learner must refer to line voltages, phase voltages or supply lines, not to lines only. Q10.3 Manipulation of formulas problematic. Q10.5.1 & Q10.5.2 Very few (maybe 2%) candidates understood the purpose of the zero volt coil (holding in contactor), and the purpose/function and operation of an overload relay/switch in motor control circuits. This must definitely be addressed.

PART TWO: ANALYSIS OF CANDIDATES' RESPONSE TEMPLATE (for completing part 3**)**

This section of the instrument will provide valuable feedback to the teaching and learning in the classroom. In order to assist the CHIEF MARKER with the analysis of learner responses, the chief marker must analyze, per question, a random sample of 100 scripts. This entails recording the responses (i.e. marks obtained) by candidates from these 100 scripts on a per question basis. From the analysis, a brief explanation must be provided per question, either:

(a) Explaining why the question was poorly answered together with suggestions for improvement, or.

(b) Describe any noteworthy observation relating to the responses of candidates.

It is expected that a comment will be provided for each question. (on a separate sheet).

The chief marker must also held discussion meetings with the marking team.

Please use a separate sheet for each question

QUESTION 1-10
1. General comment on the performance of candidates. Was the question well answered or poorly answered?
Refer to section 2 in part 1 on all questions.
Q1: Generally speaking, this question was answered well. Q2: Generally speaking, this question was answered well. Q3: Generally speaking, this question was answered well. Q4: generally speaking, this question was answered well.
Q5: This question was answered reasonably well.

Q10: This question was answered reasonably well.
Q6: This question was answered poorly. Q8: This question was answered poorly. Q9: This question was answered poorly.
Q7: This question was answered very poorly.
2. Why question was poorly answered: Also provide specific examples: See part one question 2.
Q5: Some candidates forget Ohms Law and could not use their calculators properly. Q10: Candidates did not understand the purpose of the star-delta starter, i.e. to lower the starting current of an induction motor, and how this is achieved.
Q6: Candidates did not understand the characteristic curve of an SCR and could not interpret it. Candidates did not understand the purpose and function of each component in the lamp-dimming circuit of the TRIAC. Q8: Candidates did not know how a transformer is constructed and why the core is made of laminated steel plates. Calculations regarding the primary and secondary side should be done by using phase values and not line values. Q9: Candidates did not know how PLCs are applied and what constitute inputs, outputs and internal functions. Candidates were not able to draw logic diagrams correctly from Boolean expressions. There was confusion about symbols and input labels were missing.
Q7: This question seemed not to have been taught at all in many centres. In many instances the question was left out entirely. Where attempts were made, most of the answers were wrong.
3. Provide suggestion for improvement in relation to the following :
(i) Learning and teaching
Q6: Spend more time on interpretation when the characteristic curves of semi-conductor devices are explained. Focus on the function or purpose each component fulfils in a circuit. Q8: Teach candidates about the construction of a transformer. When three-phase transformer calculations are performed, explain how phase values must be used when moving from the primary coil to the secondary coil, and vice versa. Q9: Spend time on ladder diagrams. Candidates must learn to draw labelled logic circuits form Boolean expressions, using SI and American symbols.
Q7: Teach candidates to identify the different circuits in which an operational amplifier can be used. Also teach the candidates to interpret the function of the operational amplifier in terms of its ideal characteristics.
(ii) Support
The teacher must be able to draw up a full marking memo for a question paper. (If teachers cannot do this, how can they teach the candidates?) Most question papers and memos are available on the website of the education department. A workshop, where the answers are discussed, is recommended, followed by the marking of a common paper (similar to the training process that took place for the markers prior to marking). Once this has been completed, the teachers should compare marks and discuss any discrepancies. This will ensure a common standard of what is expected of all teachers.
4. Describe any observations relating to responses of candidates: e.g positive, negative, outstanding etc.
In general, candidates gave better answers than last year, with the exception of Question 7 and parts of Question 6. The biggest improvement was in the answering of Questions 1 to 4.
5. Any other comments useful to teachers, subject advisors
Teachers should teach candidates to read questions carefully and to formulate their answers in the context of the question, and not to make up their own stories. Previous questions papers should be worked through regularly. Where possible, theoretical concepts should be demonstrated practically to assist understanding.