EXAMINATIONS AND ASSESSMENT CHIEF DIRECTORATE
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2018 NSC CHIEF MARKER'S REPORT

SUBJECT:	**ELECTRICAL TECHNOLOGY(POWER SYSTEMS)**
PAPER:	**1**
DURATION OF PAPER:	3 HOURS
DATES OF MARKING:	**30 NOVEMBER 2018 TO 12 DECEMBER 2018**

SECTION 1: (General overview of Learner Performance in the question paper as a whole)

669 Learners wrote the examinations, 451 learners achieved level 1(0% - 29%).
218 Learners managed to pass the examinations, they achieved between level 2(30% - 39%) and level 5(60% - 69%).
The candidates who passed performed as follows:
Level 2 – 112
Level 3 – 70
Level 4 – 27
Level 5 – 9

SECTION 2: Comment on candidates' performance in individual questions

(It is expected that a comment will be provided for <u>each question</u>).

QUESTION 1
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
The question was not well answered.
(b) Why the question was poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
1.1. Many learners did not explain the severity of the injury or damage but merely referred to it as an injury at work. Some learners defined accident instead of incident.

1.2.	Learners were not clear about what is asked.
1.3.	Learners knew the consequences of horseplay but could not explain why it is an unsafe act.
1.4.	Learners did not read the question properly which led them to incorrectly answering it. Learners described how the victim should be assisted.
1.5.	Confusion between quantitative and qualitative risks when answering this question.

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

Learners should be given more tasks such as class tests, home works and assignments.

(d) Describe any other specific observations relating to responses and comments that are useful to teachers, subject advisors, teacher development etc.

n/a

QUESTION 2

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

The question was answered poorly.

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

2.1. Learners didn't give full explanation of impedance e.g. they failed to mention the opposition of current in an AC circuit.

2.2. Learners were unable to show leading and lagging by means of wave form diagrams. Learners drew any wave form.

2.3. Learners confused capacitance and inductance with capacitive reactance and inductive reactance. They calculated X_C and X_l instead of C and L, some wrote incorrect units.

2.4. This question was fairly answered although some of the learners were unable to validate their answers

2.5. Many learners could not associate reactance values with resonant frequency. Most learners answered this question with the resonant frequency's formula.

2.6.1. **a and b** – learners mixed up the two calculations. They calculated X_C instead of X_L and vice versa.

2.6.2. c – learners tried to use reactive power formula to calculate reactive current. No formula was given on the formula sheet.

2.7. Few learners were able to answer the question while others struggled with it.

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

Worksheets should be given to learners and be penalized for incorrect units.

More informal assessments should be done on theory and calculations.

(d) Describe any other specific observations relating to responses and comments that are

useful to teachers, subject advisors, teacher development etc.
Learners need to know all 3 steps must be shown when doing calculations, namely: **The proper complete formula having a left – hand side equal to the right – hand side.** **The substitution with the correct values written in the correct unit.** **The answer rounded off to two decimal places including the correct unit.**
QUESTION 3
(a) General comment on performance of learners in specific question. Was the question well answered or poorly answered?
The question was answered poorly.
(b)Why the question was poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, any misconceptions.
3.1 learners got it wrong, they did not understand the question.
3.2. learners didn't correctly answer this question. Learners had problems with the wording of definitions.
3.3. The learners confused this question with advantages for consumer.
3.4. The questions were fairly answered.
3.5. The question was incorrectly answered, they mentioned more losses.
3.6. The learners were able to correctly calculate this question but some were inserting incorrect units while others were using phase voltage instead of line voltage. Learners need to know all 3 steps must be shown when doing calculations, namely: **The proper complete formula having a left – hand side equal to the right – hand side.** **The substitution with the correct values written in the correct unit.** **The answer rounded off to two decimal places including the correct unit.**
3.7. Learners were carelessly losing marks in this question as they were not writing prefixes in the second step and they inserted it in the final mark. Learners were struggling in answering this question instead they were defining the wattmeter instead of giving advantages of two - wattmeter method over three – wattmeter method.
(c) Provide suggestions for improvement in relation to Teaching and Learning
More revision and informal assessment tasks should be done on definitions, explanations and calculations.
(d) Provide suggestions for improvement in relation to Teaching and Learning
n/a

QUESTION 4

(a) General comment on performance of learners in specific question. Was the question well answered or poorly answered?
The question was answered poorly.
(b)Why the question was poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, any misconceptions.
4.1. Learners were correctly answering this question except that learners were stating the loss and gave examples of the same loss instead of giving other examples.
4.2. Learners were correctly answering this question.
4.3. The question was fairly answered although few learners managed to answer 50% of it.
4.4. Learners were incorrectly answering the question, they were not explaining the working principle instead they were giving function or purpose.
4.5. Learners were unable to answer the question. Learners were re-writing the question.
4.6. Many learners were incorrectly answering the question, some were writing protect only.
4.7. Most learners wrote incorrect formulae for turns ratio. Learners need to know that all 3 steps must be shown when doing calculations, namely: **The proper complete formula having a left – hand side equal to the right – hand side.** **The substitution with the correct values written in the correct unit.** **The answer rounded off to two decimal places including the correct unit**.
4.8. learners were correctly answering this question except that they were struggling to describe why a transformer can be used for distributing electrical power to domestic and industrial loads.
(c) Provide suggestions for improvement in relation to Teaching and Learning
More revision and informal assessments should be done on definitions, explanations and calculations.
(d) Provide suggestions for improvement in relation to Teaching and Learning
n/a
QUESTION 5
(a) General comment on performance of learners in specific question. Was the question well answered or poorly answered?
The question was fairly answered
(b)Why the question was poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, any misconceptions.
5.1. Most learners were able to correctly answer the question. Learners were struggling to fully answer the question.
5.2. Many learners were struggling to correctly answer this question.
5.3. Many learners were answering the question but some were writing twisting any two windings instead of swopping any two lines.

5.4. The question was fairly answered.
5.5. The question was fairly answered except that they were struggling in answering the operation of the control circuit. Pupils displayed little knowledge in practical understanding of starter circuits.
(c) Provide suggestions for improvement in relation to Teaching and Learning
Informal assessment tasks be done.
Worksheets must be given when doing the simulations or demonstrations so pupils can use their visual ability to actually describe the operation and function.
(d) Describe any other specific observations relating to responses and comments that are useful to teachers, subject advisors, teacher development etc.
Schools should have fully equipped operational workshops with educators who are competent with demonstrations and practicals.
QUESTION 6
(b) General comment on performance of learners in specific question. Was the question well answered or poorly answered?
The question was poorly answered.
(b)Why the question was poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, any misconceptions.
6.1. fairly well answered.
6.2. Many learners gave correct answer.
6.3. Vague or incomplete explanation given.
6.4. Learners had problems drawing the correct ladder diagram and also used incorrect symbols. Learners do not know the basic construction of truth tables.
6.5. Learners do not understand that for a component to achieve its function you actually have to write down the steps taken for it to serve its purpose.
6.6. Learners knew what analogue and digital inputs are, but could not explain why an analogue input would be changed to digital.
6.7. Poorly answered. Learners could not explain the function of the relay or how the PLC communicates with the relay.
6.8. Poorly answered as learners confused this component with something that tells time.
6.9. Pupils have a poor understanding of the function of contacts and components in circuits.
6.10. Pupils redrew circuit diagram instead of ladder diagram. Pupils do not label the ladder diagram correctly. Pupils use incorrect symbols when drawing the ladder diagram. Pupils have a poor understanding of the function or purpose of contacts and components.
(c) Provide suggestions for improvement in relation to Teaching and Learning
Informal assessment tasks should be done.

Worksheets must be given when doing the simulations or demonstrations so pupils can use their visual ability to actually describe the operation and functions.
(d) Describe any other specific observations relating to responses and comments that are useful to teachers, subject advisors, teacher development etc.
Schools should have fully equipped operational workshops with teachers who are competent with demonstrations and practical's