



*Let the mind manage the body
Que l'esprit gère le corps*

**MAURITIUS
EXAMINATIONS
SYNDICATE**

NCE 2020-2021 GRADE 9

Technology Studies

Component 1: Design & Technology

Subject code: N550

EXAMINER'S REPORT

April 2022

General Comments

The Covid-19 has had a huge impact on our education system and consequently the first NCE assessment for the year 2021 was based on a deloaded syllabus. The following learning outcomes were not assessed:

Unit	Learning outcomes not to be assessed
Green Design	<ul style="list-style-type: none">• Conduct life cycle analysis of products
Orthographic Projection	<ul style="list-style-type: none">• Insert major dimensions on drawings
Mechanisms	<ul style="list-style-type: none">• Identify the different mechanisms used in machines• Draw mechanisms using appropriate convention
Electricity and Electronics	<ul style="list-style-type: none">• Identify electrical and electronic components• Assess the function of different electrical and electronic components• Draw simple circuit diagram• Construct simple circuits• Observe safe working practices with electrical and electronic components• Use electrical and electronic tools
Pneumatics and Hydraulics	<ul style="list-style-type: none">• Describe the working principle of Pneumatics and Hydraulics systems• State the common application of Pneumatics and Hydraulics systems

The duration of the paper is one hour fifteen minutes and its weighting is 50%. The design of the assessment is based on three assessment objectives. Approximately 50% of the total marks goes for Knowledge and Understanding (AO1), another 40 % on Application Skills (AO2) and approximately 10 % is for Analysis and Evaluation (AO3).

Key messages

- Candidates need to read the questions carefully before attempting to answer.
- Candidates should focus on the key elements of each question. The marks allocated to each question and the space provided to answer the question gives a clear indication of what is required by the candidates.
- Candidates need to improve their drawing skills.

Paper Overview

Section A

Section A consists of 5 questions, including objective type questions namely MCQ items, fill-in the blanks, matching, true and false and very short answer questions. Since this section is mainly on the conceptual understanding, candidates who showed understanding scored their marks.

Comments on specific questions

QUESTION 1

Many candidates scored 80% and above. Significant number of candidates scored a minimum of three marks and the weaker candidates were able to score at least one mark. It needs to be pointed out that no mark is awarded when the choice is left to the examiners.

Item 1

The majority of candidates gave the correct answer. It was noted that a few candidates failed to differentiate tools to cut wood and metals and hence choose option 'A'.

Item 2

Good response by almost all candidates requiring the identification of the Oblique projection.

Item 3

A good number of candidates showed confusion between try square and sets square.

Item 4

This was well answered by most candidates, showing a good knowledge of 'water' as the source of energy that generates electricity.

Item 5

Some candidates failed to differentiate between thermoplastic and thermosetting plastic and failed to give 'acrylic' as the correct answer since it was the only thermoplastic material to choose.

QUESTION 2

Candidates generally understood that they had to use ‘tick’ in the spaces provided. In very rare cases, the letter ‘T’ or ‘F’ were used. Responses were of mixed level. A majority of candidates scored maximum marks. No mark is awarded in cases where ticks were placed for both ‘true’ and ‘false’ for the same statement or when a tick is placed in a confusing manner, e.g. covering both spaces of the same statement.

Item 1

This question required candidates to understand that thermosets cannot be recycled.

Item 2

The majority of candidates recognised that softwood trees take less time to grow as compared to hardwood trees.

Item 3

Only a minority of candidates were able to understand composition of Medium Density Fibreboard.

Item 4

Most candidates were able to give the correct answer and understood that bamboo stems are eco-materials.

Item 5

Many candidates were able to answer the question correctly.

QUESTION 3

Candidates were required to distinguish between three eco-green labels and two different holding tools. Most candidates understood the question well and tackle the matching exercise properly. In very extreme rare cases, two arrows were seen pointing to the same answer.

Many candidates managed to distinguish between the machine vice and the engineer’s vice. Some candidates were able to distinguish between the three eco-green labels (Biodegradable, Compostable and Green Dot) and answered the exercise correctly.

The unit “Green Design” reveals to be rather challenging as there were very few candidates who attempted items related to this unit. Recalling the different eco-green labels is essential to be able to tackle such questions.

Item a

Only a few candidates could do the matching properly. Many candidates could not distinguish between biodegradable and recyclable symbol.

Item b

Some candidates identified the correct answer.

Item c

Most candidates were able to identify the engineer's vice as the correct answer.

Item d

A few candidates could not recognise the eco-green labels particularly the compostable and the biodegradable symbols.

Item e

The majority of candidates were able to identify correctly the machine vice.

QUESTION 4

Candidates were required to fill-in the blanks with the appropriate words given in a list. All candidates understood the requirement of the question and selected the words from the list given. In rare cases, the blanks were left unanswered.

Item (a)

The majority of the candidates confused between the use of a sliding bevel and a marking gauge. Marking gauge is used to draw line parallel to the face edge of wooden workpieces whereas sliding bevel is used to draw lines at any angles other than 90^0 to the face edge on materials.

Item (b)

Most candidates were able to recognize that manufactured board is a by-product of wood.

Item (c)

The majority of candidates were able identify 'pine' as softwood.

Item (d)

Candidates had difficulty in recognising that scriber is used to mark metals.

Item (e)

Most candidates were aware that food cans are made of tin.

QUESTION 5

The majority of candidates attempted this question but very few scored full marks. Answers related to marking were not accepted except for the use of a marking knife which facilitates cutting across grain on wood.

Item (a)

Many candidates provided good examples of good practices, related to personal protective equipment and safety. The most common examples given were:

- Check that the tools are in good condition
- Secure material before cutting
- Adopt correct posture

Item (b)

To answer this question, candidates were required to demonstrate an understanding of cutting tools. Many candidates needed to improve on their knowledge and skills for this question. Some candidates provided drawings/sketches of excellent tenon saw. Credit was awarded for accuracy of the drawings/sketches and good proportion

QUESTION 6**General comments**

Very few candidates fully applied thick and thin lines to the shaped block using the appropriate technique. The lines were neat, accurate and stand out from the thin lines.

Most of the candidates scored only partial marks by adding thick lines to the outline of the shaped block. However, many had difficulties to be accurate in the application of thick lines to

the internal lines. Only a few were able to add thick lines to the circle. Some candidates presented the silhouette outline of the shaped block.

Some candidates failed to understand the question properly and used tone shading technique and even applied hatching lines. It was observed that many candidates used the wrong technique to answer the question and did not have a good grasp of the thick and thin lines techniques when applied to a shaped block with internal lines and circle.

QUESTION 7

A significant number of candidates understood the given situation and derived sketches from high to low standards relevant to the requirements.

Candidates were able to show sketches of relevant packaging that are common in their daily life and which are obtained from their daily stationaries. This suggests that they understood the word packaging and its importance. Common methods that are relevant to hold a pen and pencil securely were identified. This included the use of grooves in wooden packaging, use of strings or even pockets while using fabrics as the main material for the packaging.

Only a minority of candidates managed to display more than one 3D drawing showing how the pen and pencil will be placed along with secure systems properly illustrated with annotations.

A majority managed to analyze their sketches in terms of functionality and materials. However, only a few relevant answers included safety precautions.

A significant number of candidates could not differentiate between a holder and a packaging which eventually leads to missing out on major aspects of a packaging such as means of securing the pen and pencil.

Most candidates who attempted the question produced a low quality sketch by displaying poor knowledge of proportionality, materials thickness, texture, realistic forms with no rendering or enhancements. In addition, annotations to clearly communicate ideas and support sketches were absent.

The analysis of proposed idea in terms of materials and safety was poor in quality. Candidates' answers reflected misconception between safety of the user for the packaging and safety of the pen/pencil.

QUESTION 8

Candidates were asked to complete a full size isometric drawing of a camera with corner A as the lowest point. The body of the camera needed to be drawn 100mm wide by 40mm deep with a height of 60mm. The upper part needed to be a trapezium as front face with a sloping side and top 40mm deep. A circular hole needed to be drawn in the middle of the front face of the body having a diameter of 50 mm.

Only a few candidates scored full marks by producing excellent answers. Many candidates were able to draw only the body of the camera (cuboid) in isometric projection. Most candidates were able to locate only the position of the centre of the circular part in the middle of the front face. Candidates who used a crate for the upper part were able to draw the trapezium correctly with its sloping sides and top. Many candidates scored one mark for being able to draw part of the trapezium on the front face.

Many candidates did show some basic knowledge of isometric projection but were not able to complete the drawing fully. Many candidates were not able to use the 4-arcs centre method to draw the circle in isometric projection instead drew a regular circle.

A few candidates were unable to use the correct dimensions.

A few candidates used oblique projection for their drawing for which marks were not awarded.

Some candidates did not use construction lines or erased construction lines which was supposed to be left on the answer as mentioned in the instruction to candidates.

Poor quality of lines and poor neatness were observed.

Some candidates did not attempt the question at all and did not score any marks.

CONCLUSION AND RECOMMENDATION:

Candidates need to understand and follow the instructions carefully before attempting any question.

Open-ended questions are a challenge for most candidates and they should practice more questions related to design process, drawing blocked shapes with drawing equipment either in 2D or 3 D. Demonstrations are encouraged as it promotes observation skills, which is very important in the learning of Design & Technology.

While carrying out demonstrations in the workshop, it is important that the attention of the candidates be drawn to the safety precautions to be taken in the workshop. They need to be able to differentiate between the tools that are used while working with wood and those used when working with metals. They should also be able to identify the right tool for the right job or process.

Research has shown that learning is promoted by doing hands-on activity and this helps to develop the acquired skills which helps learners develop their analytical and thinking skills.

It is recommended that basic workshop tools should be made available to all schools particularly girls' schools. Educators should be reminded that time should be devoted to demonstration and practical classes wherever possible as theoretical classes is not sufficient. demonstration of the different tools should be covered during teaching.

Tone and shading: When it comes to rendering using thick and thin lines technique, it should be clear that all external lines equals to THICK LINES and most internal lines (but not always) equals to THIN LINES. Demonstration and application of thick and thin lines should be made using appropriate pressure on the pencil (The harder you press, the darker the line). Educators are encouraged to conduct practical sessions with exercises related to thick and thin lines using a variety of shaped block with external lines, internal lines and sloping edges are to be encouraged at school.

For the Design Process: Candidates must be instructed about the meaning of an analysis in design process. An analysis is invalid in the absence of the required sketch. Candidates should read and understand the given situation properly so as to avoid irrelevant answers. Candidates should be encouraged to use annotations so as to better communicate their ideas.

Practice makes perfect. Candidates should be given exemplar materials and guidelines for question related to problem-solving. The design process should be included at regular intervals from the start of the year to prepare the candidates in a constructive manner to develop analytical skills.

Pictorial projection: Consideration should be laid on the quality of line (construction and outline) and neatness. Candidates should have access to proper drawing equipment during their course of study. They should be encouraged to use the crate method to solve problems related to dimensions. Candidates should be able to visualise objects in 2D and 3D. They should master the different projections used for drawing objects in 3D such as isometric projection at 30° on

both projection lines whereas oblique projection is at 90° on one projection line and 45° on the second projection line.