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

MAURITIUS EXAMINATIONS SYNDICATE

NCE 2024 GRADE 9

Technology Studies

Component 1: Design & Technology

Subject code: N550

EXAMINER'S REPORT

General Comments

The examiner's report is intended to provide constructive feedback on candidates' performance. It offers valuable guidance for future candidates, outlining key insights, content and skills assessed in the questions, and areas of both strong and weaker performance. The report should be read in conjunction with the corresponding question paper which is available for download from the MES website.

The 2024 NCE assessment encompassed the entire syllabus and was administered in October 2024.

The paper duration was one hour fifteen minutes, contributing 50% to the overall assessment in Technology Studies. The assessment design is aligned with three Assessment Objectives. Approximately 50% of the total marks evaluated Knowledge and Understanding (AO1), 40 % focused on Application Skills (AO2) and approximately 10 % assessed Analysis and Evaluation (AO3).

The paper consists of Section A (25 marks) and Section B (25 marks). It was designed to cater to a wide range of abilities and was accessible to all candidates.

Key messages

- Candidates must carefully read the instructions provided on the cover page.
- Candidates need to read the questions carefully before attempting to answer and try to focus on the key elements of each question.
- The marks allocated to each question or part of a question indicate the expected depth and detail of the response.
- Candidates are encouraged to develop their drawing skills and become proficient in using drawing instruments to represent objects accurately in both 2D and 3D formats.

Paper Overview

Section A

Section A consists of five questions, including objective type questions such as multiple-choice questions (MCQs), fill- in the blanks, matching, true and false and very short answer questions. This section focuses on core knowledge and understanding of design and technology.

To perform well in Section A, candidates should possess a broad knowledge of materials and drawings. They must also demonstrate the ability to apply the knowledge they have acquired

Comments on specific questions

QUESTION 1: Multiple Choice

Approximately 50% of the candidate population scored between 4 and 5 marks. The majority followed the instructions correctly. The inclusion of diagrams and photographs in certain items aided candidates in identifying the correct answers, contributing to better overall performance. In rare instances where candidates did not strictly follow the instructions, but their answers were nonetheless consistent (e.g., using ticks or crosses), and marks were awarded accordingly.

Important note: Candidates are expected to circle the letter corresponding to the correct answer when responding to multiple-choice questions.

Item 1.

The majority of candidates answered this item correctly, selecting ‘measuring tape’ as the appropriate answer.

Item 2.

Most candidates correctly identified ‘A try square’ as the correct tool. However, some mistakenly selected ‘An engineer’s square’ which was a common error.

Item 3.

This item had the lowest success rate. Many candidates showed uncertainty in choosing the correct answer from the four options provided. A notable number incorrectly selected ‘Polyvinyl Chloride.’

Item 4.

This item was well answered. Most candidates correctly identified ‘Machine vice’ as the correct response.

Item 5.

A significant number of candidates correctly identified option ‘A’ as the eco-green label representing products made from recyclable plastic.

QUESTION 2: True or False

Candidates generally followed the instructions given by using ‘ticks’ in the spaces provided. In rare cases, some used the letters ‘T’ or ‘F’ consistently. Where this was done accurately, marks were awarded. Approximately 75% of the candidate population scored three marks or above on this question.

Item a

Most candidates correctly recognised that the statement ‘High carbon steel is a ferrous metal’ is false.

Item b

The majority of candidates easily identified ‘A hammer is a driving tool’ as a true statement.

Item c

Most candidates successfully identified ‘Bamboo stems are examples of eco-materials.’ as a true statement.

Item d

Most candidates correctly identified ‘A steel rule is a holding tool’ as a false statement.

Item e

In many cases, candidates failed to identify ‘Red cedar is a softwood’ as a true statement.

QUESTION 3: Fill in the blanks

Most candidates understood the requirements of this question and successfully selected the correct words from the list provided. Approximately 70% of the candidate population scored between 4 and 5 marks. However, a few candidates had difficulty in identifying or selecting proper words from the given options.

Item a

The majority of candidates correctly selected ‘Teak’ as a hardwood. A few chose ‘Pine’ or ‘Chipboard’, which were incorrect.

Item b

Most candidates recognised ‘Acrylic’ as the correct answer.

Item c

This item was answered correctly by most candidates. They correctly identified 'Copper' as a good conductor of heat and electricity.

Item d

This item was well answered by the majority of the candidates, who correctly selected 'Chipboard'. A few candidates incorrectly chose 'Teak' or 'Pine', which were not accepted.

Item e

The majority of candidates successfully identified 'Pressurised air' used in a pneumatic system as the correct answer . Marks were not awarded even if one word, for example: 'Pressurised' or 'Air' was written.

QUESTION 4: Matching

This question focused on basic hand tools technology, specifically tools used for cutting, driving and holding. Candidates were required to match the names of the hand tools to their corresponding photographs, demonstrating knowledge of common hand tools. Approximately 51% of the candidates scored 4 to 5 marks. In a few cases, candidates incorrectly identified a 'Jack plane' as 'Engineer's vice', indicating some confusion between tool types.

QUESTION 5a – Very Short Answer

Most candidates attempted this item. However only about half of the candidate population scored 5 or 6 marks. This question assessed understanding of mechanical components. Some candidates incorrectly identified a cam as a gear, while others responded with random or unrelated answers, reflecting a limited understanding of mechanical components.

QUESTION 5b – Sketching

The majority of candidates demonstrated a good understanding of hand saw, both in 2D and 3D. A few candidates produced high-quality sketches incorporating rendering techniques which enhanced their responses.

Many candidates were awarded marks for producing neat and proportionate sketches. However, some candidates struggled with aspects such as proportion, shape of handle, tapered blade, teeth design, and the overall quality of the sketch. A few candidates produced sketches of tenon saws and other types of saws; in such cases, marks were awarded only for elements that matched the expected features, such as the appropriate handle. Very few candidates did not attempt this part of the question.

Section B

Section B comprises Question 6 on tone shading, Question 7 on design problem, and Question 8 on orthographic and oblique projection.

To excel in this section, candidates must demonstrate a comprehensive understanding and mastery of the following:

- the application of the appropriate rendering techniques to enhance the visual quality of an object;
- the strategic use of the design process to effectively solve design-related problems;
- proficient use of drawing instruments to accurately draw objects both in 2D and 3D.

QUESTION 6 - Rendering

25% of candidate population scored between 3 to 4 marks. Responses were completed using either coloured pencils or graphite pencils. It was observed that some candidates have applied a single colour and its tones properly. However, a few candidates did not applied tones at all, and a very small number attempted hatching lines on the given shaped block which resulted in no marks. In several instances, candidates failed to respect the given direction of light, and as a result, full marks could not be awarded.

QUESTION 7 – Design Problem

Approximately 35% of candidates scored between 4 to 5 marks. Many candidates demonstrated a commendable understanding of the design process, showcasing creativity and a thoughtful approach in developing a spice rack either in 2D or 3D. The majority of the ideas were presented as desktop, wall mounted or freestanding units.

However, only a few candidates accurately identified or justified appropriate material and safety considerations for a spice rack. In some cases, rendering or enhancement techniques were applied effectively. However, many sketches lacked quality and creativity, revealing limited knowledge and poor application of proportion, presentation of material thicknesses and realistic form. Some candidates used annotations with appropriate vocabulary to explain the design rationale. In selected cases, rendering was applied to enhance the visual presentation of ideas.

In terms of material considerations, most candidates selected specific and suitable options such as acrylic, pine, teak, PVC, copper, stainless steel, rubber, silicone, among others. However, a few candidates used generic terms such as ***wood, metal, plastic and smart materials*** for which marks were not awarded.

Most candidates addressed potential risks associated with the chosen material, finishes and overall construction for example:no sharp or pointed corners, no toxic finish/material, or ensuring spice jars are securely held. Only a few candidates demonstrated a comprehensive approach to both user and product safety.

QUESTION 8 – Orthographic and Oblique Projection

This question assessed candidates' ability to use the appropriate drawing instruments to draw objects in 2D or 3D, and to interpret technical drawings accurately. Only the most proficient candidates achieved high marks, with some producing exceptionally well-drawn responses. Overall, the standard of work was an improvement over previous years. The spaces provided greatly assisted candidates in drawing the front and top view correctly and proportionally, as well as in constructing the oblique projection in the specified direction.

(a) Orthographic Projection

Approximately 31% of the candidate population scored between 7 to 8 marks. They were required to complete the front and top views of a 3D shaped block in the space provided. Most candidates made effective use of the designated space. Candidates who carefully studied the isometric view, interpreted dimensions accurately, and achieved the best outcomes. Only a very small number did not attempt the question.

Some candidates visualised the views correctly but failed to apply accurate dimensions, and thus did not receive full marks. No marks were awarded for freehand sketching of the views. In certain cases, candidates drew their responses at the back of the answer sheet; this was not penalised. While many completed both views, a number of candidates omitted major dimensions on the front view. In cases where only one major dimension was added even if not entirely conventional, one mark was awarded.

In several instances, candidates failed to outline the outer shape for both views, resulting in no marks.

(b) Oblique Projection

Approximately 32% of the candidate population scored between 6 to 7 marks. They were asked to complete a full-size oblique drawing of the shaped block based on the provided orthographic projection. The most able candidates interpreted the orthographic views and produced highly accurate, neat oblique drawings with correct dimensions.

Many candidates successfully drew the front view in oblique projection but omitted several receding lines, which left the drawing incomplete and led to penalties. Some candidates produced high-standard oblique drawings, but from an incorrect viewing direction, despite the given starting point "A" and were not awarded marks.

A very small number of candidates submitted only sketches of the oblique view, which were not eligible for marks. A few misinterpreted the given dimensions but still produced quality drawings, for which they were partially penalised.
In many cases, candidates produced high-quality drawings but failed to use the specified 60 mm depth, leading to partial deductions.

CONCLUSION AND RECOMMENDATIONS:

Design-related questions present a challenge for many candidates, and additional practice of design problems is recommended. More emphasis should be placed on sketching techniques and clear annotations.

It is advisable for candidates to practice drawing shaped blocks using drawing equipment, both in 2D or 3D. Demonstrations play a crucial role in enhancing observation skills and promoting learning in Design & Technology. During workshop demonstrations, Educators should emphasise to ensure that students are aware of the necessary safety measures to be taken.

To improve their understanding of the practical processes and techniques, candidates should familiarize themselves with working with resistant materials such as wood, metal and plastic. To achieve this, candidates are required to match correct tools and equipment with specific purposes.

Research has shown that hands-on learning significantly boosts skill development, helping learners sharpen both analytical and problem-solving abilities. Educators should allocate sufficient time for demonstration and practical sessions, as theoretical classes alone may not be sufficient for comprehensive learning.

Pictorial projection

Emphasis should be laid on the quality of line (construction and outlines) and overall neatness. Candidates should have access to proper drawing equipment throughout their studies. The crate method should be encouraged for solving dimensional problems. Candidates need to visualise objects in both 2D and 3D, mastering various projections used for 3D drawings, such as isometric projection at 30^0 on both projection lines, with receding lines in oblique projection set at 45^0. Educators may provide pre-printed sheets for isometric and oblique projections to familiarize students which the NCE question paper format.

Tone shading techniques

Candidates should be encouraged to use pencils or coloured pencils to create varying tones. They should practice both flat and uniform shading techniques. Pre-printed shaped blocks should be provided to help students practice different tones, especially when dealing with sloping and curved surfaces.

Material Technology

Educators should encourage students to become familiar with tools through drawings, pictures, charts, videos and hands-on activities in workshop. Intensive practice in sketching particularly of tools should be prioritized, with students encouraged to work on both 2D and 3D sketches. Educators should conduct more demonstration sessions and emphasize on the proper classification, properties, and uses of materials and hand tools.

There appears to be a lack of familiarity with hand tools among candidates. More demonstrations and workshop practical should be incorporated to strengthen hands-on skills. Educators should also encourage students to be more familiar with related questions and ensure that objectives for each chapter are fully addressed in class discussion.

The Design Process

Students should be regularly exposed to design problems, allowing them to practice sketching ideas in both 2D and 3D formats. Regular practice is crucial for improving their sketching skills. Students should be encouraged to produce clear, well-drawn sketches when responding to design questions. Enhancing sketching through project work, particularly for generation of idea, will also improve presentation skills, enabling candidates to produce accurate annotations and proportionate sketches.

Candidates should be given design problems on pre-printed paper in a format similar to that of the NCE question paper for further practice. Additionally, candidates should be made more familiar with the properties of various materials.

Orthographic Projection

Educators should encourage their students to use drawing equipment such as boards, T squares, set squares (30°/60° and 45°/45°). Students should become familiar with the different types of set squares and understand when and how to use them. Pre-printed sheets for orthographic projections should be provided to familiarise students with the NCE question paper format. Educators should also encourage students to use different types of pencils for construction lines and outlines, ensuring appropriate use of construction lines.

Final thoughts

This report provides a roadmap for improvement in design thinking, drawing accurately, and practical engagement. With strategic adjustments to teaching methods and focused preparation, students will be better positioned to excel in future assessments.