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1997 HIGHER SCHOOL CERTIFICATE
EXAMINATION REPORT
INDUSTRIAL TECHNOLOGY

General Comments

Industrial Technology was re–examined for the first time in 1997, when 764 candidates presented for the 2 Unit examination in Industrial Technology. The total candidature was divided amongst the Syllabus Areas of Study as follows:

•	Wood	664 candidates
•	Metal	60 candidates
•	Drawing	30 candidates
•	Automotive	6 candidates
•	Electronics	4 candidates
•	Plastics	nil candidates
•	Ceramics	nil candidates

Written Paper (40 Marks)

Section I Multiple–choice Questions 1–10

Students should be reminded to select the choice (A, B, C or D) that best answers the question. Although in some the choices will be similar, an aspect of one of the alternatives will provide the best solution to the question. A broad knowledge of the Industry Study section of the Syllabus will assist candidates in answering these multiple–choice questions.

Section II Questions 11 and 12

Candidates are reminded that they must answer Question 11 in terms of the Area of Study undertaken. For example, candidates studying Industrial Technology — Wood, must answer this question with reference to the *wood* industry.

Question 11

(a) (i) Many candidates did not study a specific company related to their Area of Study. Some had studied a company run by a single person which made answering some the questions in this section difficult.

(ii) Answers to this part were generally good.

(b) This part was well answered by those who had studied a larger company in partnership. In the case of candidates who had studied a single–person company, it was accepted that three different roles were being performed by one person.

(c) (i) The product named was the same as one named in part (a) (ii).

(ii) Answers to this part were good since candidates had a knowledge of resources and raw materials.

(iii) Since candidates had very little understanding of a production process, answers to this part were poor.

(iv) The finishing of the product was the step most commonly named; some candidates, however, failed to understand that a step in the production process should be given and that parts (ii) and (iii) referred to the product given in part (i).

(v) This was well answered.

(d) Answers here were reasonably good.

(e) Answers here were poor, since many candidates failed to understand the difficulties that could arise between strategies given in part (d) and promotional techniques named here. In many cases the same answers were given for parts (d) and (e).

(f) The majority of candidates used the examples of *dust* and *noise* and answered this part reasonably well.

(g) Most candidates failed to link computer technology to efficiency in office administration and, consequently, answers were poor.

(h) Those who had visited companies where computer technology had not been introduced into the production process had difficulty in answering this question. Many failed to realise that the introduction of computer technology had to be linked to improved production.

Question 12

(a) This part was reasonably well answered.

(b) Answers here were very poor. Candidates had little knowledge of the importance of size, shape and proportion in relation to design.

(c) Answers to this part were fairly good.

(d) Most candidates selected keywords from the word list given, and produced a flow chart that showed a good understanding of the development and production of a major project.

Section III Areas of Study: Automotive

Question 13

(a) The orthogonal drawing was well done by most candidates.

(b) Some candidates had difficulty in explaining how the magneto system generates a spark at the spark plug.

(c) (i) Calculation of engine displacement was not handled well.

(ii) Most candidates found it difficult to name and describe the use of the appropriate tools for measuring the specifications given.

Question 14

(a) Satisfactory responses were given to this question on avoiding safety hazards.

(b) This part was generally satisfactorily answered, although the responses given tended to be repetitious.

(c) Candidates either did not read the question carefully or did not understand that brakes, cooling and other systems were specifically excluded when answering this question.

(d) The parts on the control unit and fuel injector were answered satisfactorily, but answers on the crankshaft sensor and neutral switch were poor. Candidates did not appear to have used the given diagram.

(e) Answers to this part were good.

Question 15

(a) All answers here were acceptable, most being good.

(b) (i)
and Responses to the question on rust were poor. Answers to part (ii) were reasonably good.
(ii)

(c) (i)
and Descriptions of VIN and Compliance Plate were not good.
(ii)

(d) Most responses here were acceptable.

(e) The majority of candidates did not have a good understanding of diagnostic mechanics.

(f) Candidates found it difficult to list the advantages of both two–stroke and four–stroke motors.

(g) Answers to this part were fairly good.

Section III Areas of Study: Drawing

General Comments

- Most responses were not good.
- Technical knowledge was poor.
- Drawing accuracy must be within a tolerance ± 0.5mm.
- Candidates need to read questions carefully and to answer the question asked.

Question 13

(a) (i) Sectioning Standards were freqently not understood.

(ii) Few candidates showed ability using AS1100 drawing standards. Line thickness and dimensioning standards were generally ignored by candidates; hexagonal set screw, however, was generally well done.

(b), (c)
and On the whole, answers to these parts were good.
(d)

(e) Only the simpler terms and symbols were known.

(f) Most terms were not known by the majority of candidates and, consequently, this part was poorly done.

Question 14

(a) A large number of candidates had difficulty in indicating the architectural symbols for *light switch* and *power point.*

(b) (i) The conventional techniques or symbols for architectural drawing were poorly understood.

(ii) Most candidates had difficulty in completing roof details accurately.

(c) The majority of candidates did not answer this part well.

Question 15

(a) This drawing was very well done by most candidates, although some difficulties occurred with scale, small tab and the safety edge on 180mm edge.

(b) All those who attempted this question handled it well.

Section III Areas of Study: Electronics

Question 13

Candidates generally knew the type of components indicated by the numbers, but did not give the full name. The question on resistors was well answered, but answers to that on capacitors were poor. Knowledge of component functions was quite sound, while calculation of costs was handled well. Calculation of total resistance and capacitance, however, was only average since many candidates did not show working.

Question 14

Answers comparing the simplest construction of a PCB in a school workshop and that of a complex PCB were quite brief and vague, but soldering techniques were well known. The question on generation of power was also well answered.

Most candidates were able to do calculations on current from given information and possessed sound knowledge of fuses and circuit breakers. Questions on CMOS devices were answered satisfactorily when information was obtained from the given data page. Other questions on CMOS devices, however, were not well handled.

Question 15

Answers on circuit theory were fairly well done, but those on the design question were poor. The question on transistors was handled well.

Section III Areas of Study: Metal

Question 13

(a), (b)
and Candidates had difficulty in interpreting the drawing scale in dimensioning to acceptable
(c) standards and in representing the screw thread. A limited understanding of sectioning was also apparent.

(d) Answers here were good.

(e) This part was also well answered.

(f) Candidates possessed only a limited understanding of the concept of shoe assembly as shown in the drawing.

(g)
and Both these parts were well answered.
(h)

Question 14

(a) (i)
and Most candidates appeared to possess limited understanding of basic lathe operations.
(iii)

(ii) Sketches of the parting tool were very poor.

(iv) Few candidates showed an understanding of the use of a Vee Block, the sequencing of the drilling operation was generally poor.

(b) (i)
and Very limited understanding of specific lathe operations was shown in answering these
(iii) parts.

(c) Most candidates appeared to have a good understanding of the advantages of using CNC lathes rather than hand–operated machines.

(c) Answers here were good.

Question 15

(a) Poor comparisons were made of the advantages and disadvantages of each of the materials named. Responses were too generalised.

(b) Answers here were good. It is emphasised, however, that students must understand the differences between freehand sketches and drawings.

(c) Limited knowledge of surface preparation and finishing was apparent in many responses.

(d) Interpretation of the term *pictorial drawing* was poor. Many candidates failed to show necessary details on their drawings and explanatory notes were often inadequate. Although accompanying notes were a requirement here, they did help those candidates with poor drawing skills.

Section III Areas of Study: Wood

Question 13

(a (i) Candidates showed little understanding of the difference between *function* and *aesthetics*.

(ii) Few candidates appeared to understand the term *standard cross–sectional size.*

(b) Some difficulty was experienced with the scale 1:10. Candidates showed little knowledge of projection between views.

(c) Very few candidates picked up the error in rail length. This was generally well answered, though many errors with calculators occurred, eg $234.00 rather than $23.40.

(d) Method of payment, delivery method, date, name, are all irrelevant to a timber order to purchase required material.

(e) (i) Generic timber names such as *Maple* and *Cedar* were unacceptable in answering here. The name of a specific species or a marketing name should have been given.

(ii) Many candidates answered by saying *pores, vessels, tracheids, rays, fibres,* ie they included everything they could think of. Those providing a list of cells were marked as being incorrect.

Question 14

(a) (i), (ii)
and These parts were generally well answered.
(iii)

(iv) Here many candidates gave an inappropriate choice of adhesive for external use or, in some cases, wrongly named a *joint* .

(b) Most candidates could not name the edge treatment shown.

(c) (i) Answers here were poor since candidates possessed little knowledge of the technicalities of the plane and its parts and functions.

(ii) Many candidates did not interpret the question correctly and answered in terms of grinding and sharpening.

(d) (i)
and Most candidates answered this part well; in some cases, however, there were difficulties
(ii) with the sketching of the router cutter.

(e) (i) This part was generally well done, with most candidates recognising the purpose of the timber plug.

(ii) Many candidates were unable to name the screw. Very few were able to state the correct size of the screw, and as a result, simply provided the length.

(f) (i) Answers should have related specifically to the barbecue trolley. Most candidates could recognise the machine tool, but many did not recognise the description of its specific function in the production of the barbecue trolley as being part of the question.

(ii) Many candidates confused general safety rules with the safety requirements of the specific examples in the question.

Question 15

(a) Candidates generally displayed poor skills in sketching their tray design. Many appeared to have difficulty in visualising realistic dimensions for the tray. Details of joints, ie, exploded diagrams, notes, cross section etc, were poor. Students need to spend more time in doing concept sketches and diagrams to solve problems.

(b) *Steps in Construction* — Many candidates were unable to identify recognisable and separate steps in the construction of the trays. *Materials and Machine Tools* was generally well answered, although many candidates failed to realise that the materials were restricted to Australian Hardwoods. *Radiata Pine* was a common answer.

(c) Answers to this question related to the *handle design* were poor. Candidates failed to recognise the different manufacturing techniques practised in a school workshop and in a *small joinery shop*. Few answered the question in terms of an industrial process. Many failed to understand that questions beginning with *explain and describe* require a structured sentence response, consequently one or two word responses were common.

(d) This section was very well answered. The majority of candidates gained maximum marks for the required design modifications.

Major Work and Folio **(60 Marks)**

A wide variety of projects was presented by the candidature. In many cases these projects represented a great deal of innovative thought, careful planning and detailed construction. Examiners reported that students must ensure that the finished product is carefully explained through the use of a detailed planning and construction folio.

Folio

There was general concern that many teachers had failed to differentiate between the Subject Rules of Industrial Technology and Design and Technology. This led to incorrect headings and irrelevant information being used throughout the folio. In the areas of research and development there was a lack of relevant information and sequencing of procedures, with many examples of information being taken directly from the Internet, but having little or no relation to the project. Many folios appeared to have been written after the projects were completed, with little thought having been given to management of the project and of time. High quality projects were, in most cases, accompanied by excellent folios. Students must be aware of the Industrial Technology Subject Rules so that planning and management aspects of the project can be clearly outlined in the folio.

Planning and Construction

The quality of workshop drawings presented by candidates was generally poor, with little application or knowledge of correct and current drawing standards (AS1100) being apparent. Very few candidates understood the concept of justifying their selection and use of materials, components and processes. The majority were able to provide an adequate record of their production processes.

Design

Candidates generally used appropriate materials and processes to complete their projects. Documentation of the *design process* followed was, however, generally poor. Many failed to document choices or to give sufficient details of any modifications that were made to their Major Projects. Design modification should not be considered to consist of only a few sketches.

Construction

A number of candidates did not select projects that allowed them to show a range of technical skills. Many attempted projects that were beyond their ability and, as a result, failed to maximise their Major Project mark. Those who followed a systematic approach to project selection and development, generally received outstanding results. The finishing of projects was generally poor. More consideration to the finishing phase needs to be given during the initial planning of projects.

General Comments

Major Projects need to be completed and set up in an environment conducive to Higher School Certificate examining. The choice of a suitable location is extremely important. A venue which is well lit, noise–free and disturbance–free needs to be provided, while all necessary documentation should be completed and presented to the examiners on their arrival.