2000 HSC Notes from the Examination Centre Industrial Technology

Industrial Technology

Introduction

In 2000, 2754 candidates presented for the 2 Unit examination in Industrial Technology. This candidature represented an increase of approximately 500 candidates above the 1999 candidature. The largest increase was in the Furniture and Timber Products Industries, with growth evident in the Multimedia Area of Study.

The majority of candidates found the written paper very demanding. It seemed that the 'theoretical' content of the course had not been learnt by many candidates. It is important to stress the balance of the Major Work and the theoretical content during the HSC year.

The total candidature for the 2000 examination was divided amongst the Syllabus Areas of Study as follows:

Area of Study	*Candidature*
Automotive Industries - Engine	58
Automotive Industries - Body	11
Automotive Industries - Chassis	5
Building and Construction Industries	0
Electronics Industries	110
Graphics and Multimedia Industries – Architectural Drafting	80
Graphics and Multimedia Industries – Mechanical Drafting	30
Graphics and Multimedia Industries – Multimedia	36
Furniture and Timber Products Industries	2215
Metals and Engineering Industries	209
Plastics Industries	0

Section I

Question 1   (10 marks)

(a)   (i)   Most candidates did not refer to "air pollution". Many candidates had no knowledge of the 1987 Clean Air Act.

   (ii)   "Interim" was not understood well. Use of plural was often overlooked. Few responses other than "fix" or "new machines". Few candidates referred to the "before" section.

   (iii)   There was little expansion of recommendation beyond a point answer.

(b)   Few candidates related answer back to the original introduction and the statement in relating, "restructuring" and "efficiency". Few candidates understood the roles well and many had problems relating, "restructuring" and "efficiency" to union and workforce role.

(i)   This question was well answered by most candidates.

(ii)   Candidates demonstrated a poor understanding of retrenchment practices. The answer required "negotiated settlement", but few candidates expressed this answer, most discussing "length of service".

Question 2   (5 marks)

(a)   Few candidates related needs for systems to the size of the workforce and across all levels. Many candidates did not understand the concept of a structured communication system.

(b)   The title of "middle management" caused concern among some candidates but, overall, this part was answered well. Candidates often named a strategy but neglected descriptions or relating strategy to management. "Facilitate" was used differently by many candidates, many seeing it as a means to improve work relationships.

(c)   (i)   Well answered by most candidates.

(ii)   Most candidates only wrote about increased contact ability

(d)   (i)   The word "improve" proved difficult to interpret and most candidates ignored it in their answer. Few candidates related the role of Production Manager to the question (i.e *to improve production and expand*). Many candidates confused "quality" and "quantity".

(ii)   Most candidates mentioned "survey" but found it hard to relate to the question.

Question 3   (10 marks)

(a)   Many candidates confused "impact" on the company to the effect unskilled workers had on the company. Common answers included "time" and "money".

(b)   (i)   Candidates often gave a strategy but without a description relating to the question. Some candidates missed the point of the question relating to the existing employees.

(ii) Candidates generally understood the concept of "multi-skilling", but had difficulty describing "impact".

(c) (i) A common answer related to a "safer workplace", but explanations were poor.

(ii) Some confusion with the term "culture" with many candidates referring to "multi-culturism" in the workplace. A feeling of "safety" was a common answer. Poor explanations from most candidates.

(iii) Most candidates mentioned "training" as a strategy but did not explain this well or provide examples. Few candidates mentioned "absences".

Section II

Area of Study – Automotive Industries   (15 marks)

There were a total of 74 candidates in Automotive Industries :-

OPTION	No OF CANDIDATES
Engine	57
Body	11
Chassis	5
Electrical	0

The format of the elective examination papers in Automotive Industries involved questions with parts and a format that was common across all electives. Question 4 was compulsory and the style of question across each option was similar with different content areas being addressed for questions 5, 6 and 7.

Option – Engine

Overall the standard of drawing showed improvement this year with candidates exhibiting a sound understanding of the drawing question. Sketching was well done with candidates having a good understanding of drawing concepts, dimensioning and layout.

Candidates had a good knowledge of Australian Design Rules, but in many cases they were unable to relate these to the engine.

In many cases candidates had difficulty in understanding the direction of the questions and did not relate the answers to the option they were studying. In many cases the term "preventative maintenance" was not interpreted correctly and candidates were unable to analyse benefits.

Option - Body and Chassis

Candidates showed little understanding of drawing standards and had difficulty in interpreting what was required in the drawing question. Most candidates were able to show some understanding and knowledge of assembly.

Most candidates had difficulty with explanation / description although through their response they were able to demonstrate some knowledge by providing key words.

The term "preventative maintenance" created problems for most candidates. Most were unable to answer in a logical form and relate the concepts to the question

There were a number of candidates who attempted all questions in Section II.

Area of Study – Electronics Industries   (15 marks)

Question 4
Candidates generally showed a good understanding of graphical developments, with the quality of the sketches being better than they have been over the past few years. The instructions for Part (b) were on the previous page and many candidates did not attempt this part. For candidates that did attempt and understood this part, they answered it very well.

Question 5
Most candidates understood PCB manufacture very well except for Step 2 – transferring artwork to silkscreen. Candidates were confused by the table for colour coding of resistors – there were five columns for a four-band resistor. Calculating the total resistance for resistors in parallel presented problems for many candidates. Most candidates had a reasonable idea of the use of a voltage regulator and a heatsink.

Question 6
Most candidates explained the meaning of the terms AC and DC very well. The graph and explanation were of a good standard. Most candidates knew the function of the diode, but could not relate to the graph as requested. Very few candidates could read the capacitors to the correct value – the unit conversion presenting the biggest problem. Candidates could draw a simple circuit for the timing network but most guessed which resistor to use and put the incorrect one into the circuit. Few candidates could work out the value of the protection resistor for the LED in the simple circuit given.

Question 7
A lack of understanding of digital electronics was evident.   Truth tables, logic gates and "flip flops" were poorly understood from the responses gained. The correct use of a multimeter to check circuits and components was poorly completed by most candidates.

Most candidates did not know what a logic probe was. The sketching of circuit symbols was well done with candidates showing a high level of knowledge.

Area of Study – Furniture and Timber Products Industries   (15 marks)

Question 4

(a) (i)   The majority of candidates answered this question well. Sketching quality was much improved

  (ii)   An apparent lack of knowledge of the bridle joint confused many candidates and as such was poorly answered. Many candidates had difficulty sketching the joint in correct proportion and size.

  (iii) It was evident a large number of candidates did not read this question carefully. Candidates tended to not fully describe the correct procedure. Candidates who did not understand bridle joints had difficulty.

  (iv) Again candidates not understanding the bridle joint had trouble with this question. Many candidates gave a wide variety of alternative joints but clearly did not know what they were and hence were unsuitable.

(b) (i)   A good question linking industry to the candidate's major work, but very few candidates achieved full marks in this question.

  (ii)   A fair question but poorly answered with many candidates not taking into account the grain direction in their calculations.

Question 5

(a)   Poorly attempted showing a lack of basic knowledge. Very few candidates could give even one suitable name.

(b)   It was very rare that a candidate scored full marks. Only a fair knowledge displayed. Many candidates misread the question and did not relate to solid timber. The term "cheap" without any elaboration frequently occurred.

(c)   Many candidates offered processes to locate the tabletop, but not to <u>secure</u> the tabletop. Sketches were generally poor. Most candidates scored some marks, but frequently used the method of screwing through the top.

(d)   Very poorly answered, with many candidates not understanding the term "edge view". Many candidates 'showed' a treatment directly on the MDF. Candidates did not address the entire question eg. safety, aesthetics etc.

(e) (i) Fair knowledge of what D.A.R. stood for, but little elaboration given.

(ii) For what appeared to be an excellent question, the responses demonstrated the term "standard length" to be unknown territory for all but a few candidates.

(f) This question was answered quite well, with a large percentage of candidates scoring some marks. The quality of sketching being the weakest component.

Overall the results of this question were extremely disappointing.

Question 6

Most candidates answered this question poorly, experiencing difficulties in understanding the intent of the questions. It was evident many candidates did not spend sufficient time reading the question. Part (b) required responses to be written in a table, however many candidates failed to use the correct space. Candidates need to take more time to read the question and plan their responses.

There was a lack of knowledge of the required theoretical content, in particular classification and properties of timber, conversion, seasoning and forestry practices/techniques. Understanding of treated pine products was poor, considering their widespread use.

Free response answers in Part (c) and (d) showed that most candidates have trouble when it comes to descriptive answers that required more than a sentence. Responses were generally poorly constructed and lacking technical jargon/language. Very few candidates were able to adequately describe quarter sawing without the use of a sketch.

Question 7

Candidates had difficulty deciphering the difference between "name and describe" or just "describe" – candidates need to be able to understand key words. Many candidates failed to "read" or interpret the direction of the flowchart. Sketching ability was poor.

Question wording was generally good. It was obvious candidates either did not have the ability, or knowledge to answer these questions successfully. Basic knowledge questions were poorly attempted.

In part (c)(ii), candidates tended to merge consideration of size with explanations of other considerations. Use of words such as define, describe etc. need to be made more explicit by teachers in schools.

Area of Study – Graphics and Multimedia Industries   (15 marks)

Question 4
Most candidates had a reasonable understanding of an isometric drawing and were able to produce a good rendered drawing. Many candidates struggled with converting the isometric projection of the coat hook into an orthogonal sketch. The concept of "true shape" was not well understood and thus poorly completed.

Candidates could identify factors to be considered when setting up a computer workspace but struggled to effectively explain what was meant by 'ergonomic'.

Question 5

Mechanical Option – Candidates understanding of Pictorial Drawings was very basic. The understanding of Presentation Drawings was much better – the materials list was well completed.

Architectural Option – Roof lines for restaurant plan well attempted. Planning requirements for the restaurant were adequately answered but not all parts were answered. Candidates ran out of answers. Material specification was poorly answered, as candidates did not relate to a contemporary Australian theme. Environmental impacts poorly attempted.

Multimedia Option – Candidates could sketch storyboard pages but neglected to supply suitable notation. Design considerations supplied by students were superficial or repetitive with few reasonable explanations given. The understanding of file formats was good with many relevant and meaningful responses given.

Question 6

Mechanical Option – Generally a poorly answered question. Candidates could not explain 'planning stages' and link this to product development. Most candidates could explain one way mechanical drawing is utilised in manufacturing but not two.

Architectural Option – Very few candidates attempted this question showing a lack of knowledge of government regulations. Candidates had difficulty describing two techniques to present design ideas realistically. Site aspects were poorly attempted by most candidates.

Multimedia Option – Most candidates understood digital video very well but could not relate CD-Rom technology to the DVD. Multimedia terms were well understood. Graphic features were reasonably well done but there was some confusion due to PC and Mac symbol differences. Majority of candidates correctly explained the difference between vector-mapped and bit-mapped graphics.

Question 7

Mechanical Option – Most candidates were unable to distinguish between the different types of drawings. Identifying symbols were poorly attempted and few candidates knew the difference between functional and non-functional dimensions.

Architectural Option – The exploration of different types of drawings was either well done or poorly done. Architectural symbols were poorly answered. Very few candidates could relate the factors given to medium density development.

Multimedia Option – Most candidates could name the various input devices for multimedia publications but had trouble with the description – most candidates had little trouble explaining multimedia terms. Table was poorly attempted even allowing for PC and Mac differences. DPI sketches generally did not show the difference required. 'Postscript' technology was not understood.

Area of Study – Metals and Engineering Industries   (15 marks)

In general this paper was poorly done by the candidates. There was little understanding of drawing standards and candidates had difficulty in interpreting what was required in the drawing question. Sketching was poorly done and candidates had difficulty applying starting points to their answers.

In general candidates were unable to address technological standards, and there was a lack of understanding of technological process. Candidates had difficulty in relating industrial processes to the questions and there was ample evidence of a lack of technical knowledge in both machines and hand tools.

Candidates had difficulty in relating to the questions on gears. There was an obvious advantage to those candidates who were familiar with the topic and specifically with fishing equipment. Candidates either did very well or poorly with little evidence of the average candidate.

Overall the paper was of a reasonable standard. Candidates had difficulty with the paper, indicating some of the more simple processes had been neglected, and overall, indicating that their knowledge of metal technology was poor.

Major Work and Folio (60 marks)

There was a general improvement in the overall standard of projects presented by candidates with, as the numbers of candidates increase, a wide variety of projects presented. The new syllabus presented teachers and students an opportunity to expand upon more traditional projects and involve new and different materials and processes.

Planning, Management and Design Folio

It was evident that many folios were superficial in their approach to key elements of the Subject Rules. Once again, many appeared to have been written after the projects were completed, with little thought being given to management of the project and the management of time.

There was evidence that candidates were spending more time in planning and research. Most candidates attempted a finance plan and time plan and related this process to the management of their project.

There was a general lack of understanding of appropriate research and the consequence of that research. In many cases the research was unrelated to the specifics of the project. Many candidates had obviously prepared adequate research but failed to present this process in an organised and logical manner.

The continuing problem of candidates not understanding the process of design development was again highlighted. As for the research many candidates were unable to present this information in an organised and sequential form. Candidates were able to show the ability to sketch ideas but rarely demonstrated any evaluation of their ideas. Candidates should understand and demonstrate a process, which incorporates a progression from their initial ideas through research, critical analysis, modification and evaluation leading to the development of the practical project.

Choice and justification of materials, components and processes was generally well attempted, with candidates being able to highlight each area and document within the folio their research.

In general the criteria of record of project activities was well attempted. This area was the most prolific area of the folio with many candidates spending considerable time producing impressively desk top published information enhanced by relevant photographic evidence of the construction of their project. This section of the folio gives the markers the greatest insight into the production of the project. The use of photographs, videos and labelled displays also assisted in this criteria.

Those candidates who were able to identify and apply the examination rules and criteria were of high quality. Most of these candidates were able to demonstrate an awareness of new and appropriate technologies in the presentation of their folios.

Communication

In general this section was well attempted. Candidates must ensure that that their folios are well presented and are logical in their layout. The use of new technologies was relevant. Some candidates used digital cameras while others utilised video presentations. These processes are becoming more common and assist markers with their understanding of the project. The use of the computer in the folio was widespread although candidates

should be aware that examination criteria "evidence of a range of communication techniques" includes "evidence of a range of communication techniques including drawing, sketching, computer applications such as graphics and word processing".

Project Production

Production was generally of a better standard than in previous years. There were less low quality projects. Candidates selected projects that were within their ability although there were still a significant number whose projects were too 'BASIC' and therefore limited themselves in the marks they could obtain. Those who followed a systematic approach to project selection and development generally received enhanced results.

This year it was obvious that candidates were affected by the significantly reduced time allowed to complete their major project and folio. There were a significant number of projects presented that were incomplete or poorly and hastily finished.

Candidates need to be made aware that the all the work required to make the project needs to be displayed at the time of marking. Jigs, models, prototypes, preliminary sketches, working rods and all other material that is used during construction needs to be exhibited when the markers are present.

Industry Study

Most candidates were able to demonstrate the use of appropriate industrial processes through their school facilities or where necessary related industry.

Candidates that were familiar with the subject rules generally did well in this area. The use of photographs to demonstrate safe working practice was even more widespread than in previous years. Some candidates assigned a specific area within the folio and included written comments along with photographic evidence.