



JUNIOR CERTIFICATE EXAMINATION 1999

METALWORK

HIGHER LEVEL CHIEF EXAMINER'S REPORT
ORDINARY LEVEL CHIEF EXAMINER'S REPORT

CHIEF EXAMINER'S REPORT – JUNIOR CERTIFICATE

METALWORK

EXAMINATION FORMAT

The examination was offered at Higher and Ordinary levels and a total of 8,265 candidates presented for the examination, of whom 5,776 (69.9%) took the higher level and 2,489 (30.1%) took the ordinary level.

Marks were allocated for different examination components as follows:

Higher Level

Techniques and Design, Project	150 marks
Techniques and Design, Practical	150 marks
Materials and Technology, Written	100 marks

Ordinary Level

Techniques and Design, Project	300 marks
Materials and Technology, Written	100 marks

Techniques and Design Project/Practical

The details of the Techniques and Design Project at both levels were sent to the examination centres in the first week of November 1998 and candidates were required to complete the project by 1st April 1999. The projects were returned to the Department of Education and Science and marked by a team of examiners. The Techniques and Design Practical at Higher Level consisted of a three hour practical test held on an appointed day under normal examination conditions. Prior to examination day the candidates made a number of components. The practical tests were also returned to the Department of Education and Science for marking by a team of examiners

Written Examinations

Materials and Technology, Higher Level.

Time: 2 hours. **100 marks**

Question 1A and Question 1B were compulsory questions.

Question 1A: **20 marks.**

Answer any 5 questions out of a total of 7 questions.

Question 1B: **20 marks**

Answer any 5 questions out of a total of 7 questions.

Questions 2, 3, 4, 5, 6 and 7. Answer any 3 questions, **60 marks.**

Materials and Technology, Ordinary Level.

Time: 1½ hours. **100 marks**

Question 1A and Question 1B were compulsory questions.

Question 1A: **20 marks**

Answer any 10 out of a total of 12 questions.

Question 1B: **20 marks**

Answer all 5 questions.

Questions 2, 3, 4, 5, and 6. Answer any 3 questions, **60 marks.**

TECHNIQUES AND DESIGN - PROJECT

HIGHER LEVEL

MODEL THREE-WHEELED VEHICLE

Most of the projects presented were accurately made and fully assembled. The full range of specified materials was used plus a variety of interesting and imaginative handlebars and battery holders (design elements). In a minority of cases these design elements were absent resulting in the vehicle being unable to function properly.

The main reasons for candidates losing marks were:

- Part 9 and 14 not properly bonded.
- Holes in part 3 out of alignment.
- Bends on steering bracket (part 2) not at 90°.
- Electrical wiring absent.
- No handlebars included (design element).
- Worm gear out of alignment with gear wheel (part 16).
- No battery holder included (design element).
- Poor quality of soldering.
- Poor quality of finish on project.

General Observations

In many centres the candidates did not complete the removal of sharp corners on the rear wheels (part 12) as indicated on the drawing.

The unnecessary use of rust preventative sprays by a small number of centres before packaging made it difficult to remove the projects from the examination bags and affected their overall appearance.

TECHNIQUES AND DESIGN - PRACTICAL

HIGHER LEVEL

The vast majority of candidates presented work pieces that were fully assembled and functioning. The quality of finish however was often poor and it may be that candidates did not have sufficient time within the examination to drawfile and finish their work pieces properly.

The main reasons for candidates losing marks were:

- Radius 54mm curve on part 2 was not properly marked out or completed correctly.
- Mechanism was unable to function properly because of errors in the distance between hole centres on part 5.
- Difficulty in rotating Part 6 in Part 1 because of incorrect spigot diameter.

General Observations

The following points were noted during examining:

- The use of Black Mild Steel by some centres to manufacture Part 1.
- Excessive use of rust preventatives (including grease) which was not specified.

MATERIALS AND TECHNOLOGY

HIGHER LEVEL

The majority of candidates answered the required number of questions only. Very few answered more questions than was required. In previous years, about 20% of the candidates answered extra questions.

This year's questions based on the newer technologies, *Electronics and CNC*, were attempted as frequently as questions on the more traditional topics.

The overall standard of answering was satisfactory. A total of 62% of candidates received a C grade or higher, 8% less than in 1998. A total of 84% of the candidates received a D grade or better compared with 89% in 1998. The percentage of those who received an E grade or less was 16%, 6% greater than in 1998. However, there was a more even spread of grades this year as compared with 1998.

Candidates should be encouraged to use sketches or simple line diagrams, where appropriate, to illustrate their answers. Sketches were asked for throughout the examination paper. Many candidates illustrated their answers as requested, but did not draw sketches when asked to do so and as a result, lost marks. The overall standard of sketching was fair.

Observations

The following are comments about the answering of particular questions.

Question 1

Section A was generally well answered. Parts (d) and (e) were least well answered.

Most candidates answered Section B very well. The processes involved in making the project were well understood. Some candidates when answering part (e) did not indicate that parts 2 and 3 were soldered together.

Question 2

The new structure of this design question appears to have resulted in an increased response to Question 2, which proved to be a popular choice. Some candidates when answering part (a) referred to the actual model rather than to the design process. The majority of those who attempted this question scored well.

Question 3

In general, this question was well answered. Very few candidates identified the correct angle required in part (a)(ii). Attempts at the calculation in part (b) were poor. Many students who substituted the values correctly in the formula still managed to get the wrong answer.

Question 4

Question 4 was a very popular question with about 70% of candidates attempting it and scoring highly. The majority of candidates correctly identified the furnace in part (a), but some identified it as a Blast Furnace. Alloys listed in part (g) were well known and this part was very well answered.

Question 5

Approximately 65% of the candidates attempted question 5, which was generally well answered with the exception of part (b). In part (d), detailed sketching was inadequate in most cases. In part (e), *Galvanising* was well understood but some students failed to mention *zinc*.

Question 6

This was not a popular question. A suitable material for the centre punch was often incorrectly answered. Answers on annealing were generally poor with few candidates listing *slow cooling* as a requirement. However, part (b), which asked students to list two safety precautions, was well answered.

Question 7

About 20% of the total number who sat the examination attempted this question. The standard of answers was satisfactory. Some candidates did not correctly name the jog keys for the movement directions asked.

TECHNIQUES AND DESIGN, PROJECT

ORDINARY LEVEL

MODEL AEROPLANE

Most of the projects presented were fully assembled, finished to a very high standard of accuracy and were functional. The design feature was often creative and imaginative, with many of the students researching the colour and markings of the original Northrop B.2. Stealth Bomber, on which the project was based.

The main reasons for candidates losing marks were:

- Poor soldering technique.
- Design feature not completed.
- Motor not properly secured.
- Inaccurate bending of motor bracket and tail wheel support.

MATERIALS AND TECHNOLOGY - WRITTEN

ORDINARY LEVEL

Some of the main reasons for candidates gaining/losing marks in this written examination are as follows:

- Those who scored highly overall generally attempted all six questions.
- Candidates who scored lowly overall generally attempted the required number of questions but omitted sections of them.
- It was obvious that some candidates did not read the questions carefully. This was particularly evident with parts of Question 3 and Question 4.
- Some candidates appeared to give the correct answers but in the wrong sections of the paper.
- It was apparent that candidates did not read back over their answers to spot simple mistakes.
- The quality of sketching was generally poor.
- Lack of knowledge of particular topics was also evident.

Observations

The following are comments on the answering of particular questions.

Question 1 - Section A.

Candidates did not do as well in this question this year as they have in recent years. Most candidates answered parts (a), (b), (c), (d), (f) and (j) correctly. Parts (i), (k) and (l) were answered poorly. Common mistakes made with (e) were: *boxwood* instead of *rawhide*, (g) *round edge* instead of *wired edge* and (h) *hollowing* instead of *planishing*.

Question 1 - Section B.

This question was answered very well with candidates scoring highly in parts (m), (n) and (o). Parts (p) (i) & (ii) were answered fairly well, but part (q) (i) & (ii) were poorly answered. *Rigid* was not understood by a large number of candidates. Overall, candidates scored more highly in this question this year than they did in previous years.

Question 2.

This was a popular question but was poorly answered by many candidates.

In part (a) *plastics* was the area that created the most difficulty.

The answering of part (b) ranged from good to poor and similarly for part (c), the *lathe*. Some candidates had the correct names for the various parts but were indicated in the wrong place.

Section (c) (ii) of this question was answered fairly well.

Question 3.

Another popular question but candidates did not score highly.

Part (a)(i) was answered well but parts (ii) and (iii) were poorly answered.

Worm & Wheel was frequently chosen as the incorrect answer to (a)(ii).

Part (b) of this question confused some candidates, with mechanisms chosen from (a) or the number left out or the use omitted.

Part (b)(ii) *lever & fulcrum* was also poorly answered. Part (c) *direction of movement* was very well answered.

Question 4.

This question based on the project was not a popular one. However, the candidates who attempted it scored highly. One area that caused confusion was part (i), where the steps involved for *marking* instead of *making* the piece were given.

Some candidates also gave the answer to part (ii) in part (i) and vice versa. Parts (iii), (iv), (v) and (vi) were answered fairly well. The answers for the *circuit* ranged from very good to poor, with some candidates merely copying the sketch from the question paper.

Question 5.

Parts (a)(i), (ii) and (iii) were answered fairly well. Common mistakes with (ii) were correct *terminal name* but wrong *terminal number*. Part (b)(i), (ii) and (iii) were answered fairly well. There were common mistakes with (i) *LED* and with (ii) *loudspeaker*. For (iii) *computers, transport, and communications* were common answers. Some described *electrical* instead of *electronic* equipment. Section (c) on the theme of *inventors* was fairly well answered. A large number of candidates associated *John P. Holland* with farm machinery and *James Watt* with the light bulb. Part (c)(ii) was answered very well.

Question 6.

This was one of the least attempted questions. However, the majority of those who answered it scored highly. Part (i) was answered fairly well. Part (ii) about the *lathe processes* was poorly answered. Parts (iii) and (iv) were answered very well and the standard of drawing has improved compared with previous years as illustrated by the answers to part (v).

1999 TEASTAS SÓISEARACH STAITISTICÍ

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SCHOOL BASED CANDIDATES ONLY

Subjects	Grade A	Grade B	Grade C	Grade D	Grade E	Grade F	Grade NG	Totals
Metalwork	463	2666	1786	620	162	60	19	5776
%	8.0	46.2	30.9	10.7	2.8	1.0	0.3	
Total Female	19	108	87	63	14	4	5	300
% Female	6.3	36.0	29.0	21.0	4.7	1.3	1.7	
Total Male	444	2558	1699	557	148	56	14	5476
% Male	8.1	46.7	31.0	10.2	2.7	1.0	0.3	

1999 TEASTAS SÓISEARACH STAITISTICÍ

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SCHOOL BASED CANDIDATES ONLY

Subjects	Grade A	Grade B	Grade C	Grade D	Grade E	Grade F	Grade NG	Totals
Metalwork	160	1116	642	281	139	131	20	2489
%	6.4	44.8	25.8	11.3	5.6	5.3	0.8	
Total Female	10	90	61	31	20	16	3	231
% Female	4.3	39.0	26.4	13.4	8.7	6.9	1.3	
Total Male	150	1026	581	250	119	115	17	2258
% Male	6.6	45.4	25.7	11.1	5.3	5.1	0.8	