MECHANICAL MANUFACTURING

INDUSTRIAL DRAFTING

5725

PROGRAM ANALYSIS
AND TABLES OF SPECIFICATIONS
EVALUATION FORMS
INFORMATION ON THE EVALUATIONS

VOCATIONAL and TECHNICAL EDUCATION

Québec

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TABLE 1 - *INDUSTRIAL DRAFTING* PROGRAM (5725): SYNOPTIC TABLE OF EXAMINATIONS

Module Code	Number and Title of Module	Hours	Responsibility for Evaluation	Type of Examination (1)	Duration of Examination (2)	Maximum Number of Candidates (3)	Minimum Performance Standard	Number of Versions	Complementary Material (4)
872 311	1. The Trade and the Training Process	15	School	Pa					
872 324	2. Solving Problems Related to Industrial Drafting	60	School	T					
872 035	3. Interpreting Technical Drawings	75	School	T					
872 335	4. Producing Sketches	75	School	P					
872 345	5. Working at a Computerized Workstation	75	School	P					
872 356	6. Producing Detail Drawings of Mechanical Components	90	MEQ	P	6 hours	All	75	2	
872 364	7. Illustrating Fasteners	60	School	P					
872 373	8. Illustrating the Arrangement of Components	45	School	P					
872 386	9. Interpreting Technical Information About Materials and Manufacturing Processes	90	School	T					
872 395	10. Producing Assembly Drawings	75	School	P					
872 407	11. Using the Specialized Functions of a Computer-Aided Drafting Program	105	School	P					
872 054	12. Taking and Interpreting Measurements	60	School	P					
872 414	13. Determining Dimensional Tolerances	60	School	P					
872 421	14. Correcting a Drawing	15	School	P					
872 436	15. Illustrating Power Train Systems	90	School	T - P					
872 446	16. Producing Development Drawings	90	School	P					
872 456	17. Making a Three-Dimensional Model of an Object	90	School	P					
872 466	18. Producing Detail Drawings of a Mechanism	90	MEQ	P	12 hours	All	80	2	
872 476	19. Making Piping and Circuit Diagrams	90	MEQ	P	6 hours	All	75 / 75 / 75	2	

(1) Pa: Participation Examination T: Theory Examination P: Practical Examination
(2) Indicates only the duration of the examination for a group of students and does not include the time necessary to read the instructions.
(3) Maximum number of candidates to be evaluated at the same time by a single examiner.
(4) A checkmark in this column indicates the availability of complementary material for this particular examination.

Module Code	Number and Title of Module	Hours	Responsibility for Evaluation	Type of Examination (1)	Duration of Examination (2)	Maximum Number of Candidates (3)	Minimum Performance Standard	Number of Versions	Complementary Material (4)
872 482	20. Using Job Search or Entrepreneurial Techniques	30	School	Pa					
872 495	21. Producing Drawings for a Mechanical System	75	MEQ	P	12 hours	All	75	2	
872 507	22. Drawing the Housing of a Machine	105	MEQ	P	12 hours	All	75	2	
872 153	23. Adapting to the New Types of Work Organization	45	School	T - P					
872 517	24. Designing a Simple Technical Object	105	School	P					
872 526	25. Entering the Work Force	90	School	P					

(1) Pa: Participation Examination T: Theory Examination P: Practical Examination
(2) Indicates only the duration of the examination for a group of students and does not include the time necessary to read the instructions.
(3) Maximum number of candidates to be evaluated at the same time by a single examiner.
(4) A checkmark in this column indicates the availability of complementary material for this particular examination.

Table 2 – Equivalents for the *Industrial Drafting* program

FROM → TO

INDUSTRIAL DRAFTING DVS 5725		Mechanical Engineering Technology (DCS) 241.A0	Machining Techniques (DVS) 5723	Numerical Control Machine Tool Operation (AVS) 5724	Aircraft Manufacturing Technology (DCS) 280.B0
872 311	Determine their suitability for the trade and the training process				
872 324	Solve problems related to industrial drafting				
872 035	Interpret technical drawings	012F	872 035		
872 335	Produce sketches	012G	872 083		011U
872 356	Produce detail drawings of mechanical components	012N			
372 395	Produce assembly drawings	012U			
872 345	Work at a computerized workstation	012M			
872 364	Illustrate fasteners				
872 373	Illustrate the arrangement and movement of the components of a mechanism				
872 386	Interpret technical information about materials and manufacturing processes		872 072		
872 407	Use the specialized functions of a computer-aided drafting program	013C			
872 054	Take and interpret measurements	012P	872 054		
872 414	Determine dimensional tolerances	012S			
872 421	Correct a drawing				
872 436	Illustrate power train systems				
872 446	Produce development drawings	013B			
872 456	Make a three-dimensional model of an object	013D			
872 466	Produce detail drawings of a mechanism				
872 476	Make piping and circuit diagrams				
872 482	Use job search or entrepreneurial techniques		872 271		
872 495	Produce drawings for a mechanical system				
872 507	Draw the housing of a machine				
872 153	Adapt to the new types of work organization	012X	872 153	872 153	0127
872 517	Design a simple technical object				
872 526	Enter the work force				

Québec
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INDUSTRIAL DRAFTING

5725

The Trade and the Training Process

Module 1

872 311

PARTICIPATION EXAMINATION

INDUSTRIAL DRAFTING
5725
THE TRADE AND THE TRAINING PROCESS
(Module 1)

INFORMATION ON THE EVALUATION

1 Information and Instructions

Evaluation of the candidates' participation will be based on information gathered at certain times during the learning activities, according to the criterion components involved.

However, a criterion component should be evaluated only at the end of the corresponding phase in the learning situation.

A final evaluation of the candidates' participation in the module's learning activities should be done only once the module has been completed.

Candidates should be provided with the relevant documentation (e.g. information on the trade and the training program), as well as an outline for the report.

2 Examination Procedure

The following paragraphs provide details concerning the application of the criterion components and their interpretation.

During this activity, it is important to clearly indicate the type of information that candidates are required to gather and present in a group discussion. Regardless of the medium and conventions used to record the information, the evaluation should not focus on the accuracy, quality or presentation of the information, but rather on the candidates' efforts to compile sufficient, pertinent information on the topics to be covered and to organize it so that it can be used during a group discussion. At the end of the module, the teacher should provide feedback to any students who have incorrect perceptions.

PHASE 1 – Information on the Trade

Component 1.1

Gather relevant information on at least four topics related to the job market in industrial drafting:

- size of company
- type of clientele
- manufacturing processes
- sector of economic activity
- type of production
- use of new types of equipment

Note: Candidates may choose several topics related to the job market in industrial drafting. They are expected to provide basic, relevant information on at least four topics, without necessarily giving a complete and rigorously accurate description of the situation.

Component 1.2

Describe factory production and the different types of jobs involved:

- research into new processes
- design and drawing of products
- design of transformation methods or processes
- optimization of production, etc.

Note: Candidates may choose several steps pertaining to factory production and the different types of jobs involved. The information gathered must include specific features on each of the steps involved in factory production.

Component 1.3

Present information related to the nature and requirements of the job:

- specific requirements
- duties and responsibilities
- remuneration
- opportunities for advancement, etc.

Note: Candidates may choose several topics related to the nature, requirements, tasks, operations, skills and behaviours necessary to practise the trade.

Component 1.4

Present information on trade-related tasks and operations.

Component 1.5

Present information pertaining to the skills and behaviours needed to practise the trade.

Component 1.6

Present the information gathered and discuss their views on the trade (i.e. advantages, disadvantages, requirements) at a group meeting.

PHASE 2 – Information on Training and Participation in the Training Process

Component 2.1

Learn about the program of study and the training process.

Component 2.2

Discuss the relevance of the program given the work situation.

Component 2.3

Share their initial reactions to the program of study and the training process.

Note: The discussion should be based on the usefulness and validity of various elements in the program of study (given the job market and the requirements needed to practise the trade), as seen by the candidates. The evaluation should not be based on the accuracy of their views, but rather on the fact that they have openly expressed their opinions on the topics dealt with, by justifying their views with relevant arguments and bearing in mind the information previously gathered.

Component 2.4

Learn about the concept of techno-watch and further training.

PHASE 3 – Evaluation and Confirmation of Their Career Choice

Component 3.1

Describe their preferences, aptitudes and interests for the trade of draftsperson.

Note: The evaluation should not be based on the quality of the writing or the presentation of the report, but rather on the candidates' efforts to include the required elements.

Component 3.2

Assess their career choice by comparing the different aspects and requirements of the trade with their own preferences, aptitudes and interests.

Note: Candidates are expected to assess their career choice by indicating in the report the different aspects or requirements of the trade which have led them to choose a career in industrial drafting. Moreover, candidates must state at least three aspects or requirements which, in their view, are directly linked to their own preferences, interests and aptitudes. At this stage, their views and opinions need not be objective or accurate.

PARTICIPATION EVALUATION FORM

INDUSTRIAL DRAFTING Program code: **5725**

1 – The Trade and the Training Process Module code: **872 311**

Name of candidate: _____

School/centre: _____ Permanent code: _____

Date of examination: _____ RESULT: PASS ☐ FAIL ☐

Signature of examiner: _____

PHASE	OBSERVATION	YES	NO
1	**INFORMATION ON THE TRADE** GATHER INFORMATION ON MOST OF THE TOPICS TO BE DEALT WITH		
	1.1 Gather relevant information on at least four topics related to the job market in the field of industrial drafting.	☐	☐
	1.2 Describe factory production and the different types of jobs involved.	☐	☐
	1.3 Present information related to the nature and requirements of the job.	☐	☐
	1.4 Present information on trade-related tasks and operations.	☐	☐
	1.5 Present information pertaining to the skills and behaviours needed to practise the trade.	☐	☐
	1.6 Present the information gathered and discuss their views on the trade (i.e. advantages, disadvantages, requirements) at a group meeting.	☐	☐
2	**INFORMATION ON TRAINING AND PARTICIPATION IN THE TRAINING PROCESS** EXPRESS THEIR VIEWS ON THE TRAINING PROGRAM AT A GROUP MEETING		
	2.1 Learn about the program of study and the training process.	☐	☐
	2.2 Discuss the relevance of the program given the work situation.	☐	☐
	2.3 Share their initial reactions to the program of study and the training process.	☐	☐
	2.4 Learn about the concept of techno-watch and further training.	☐	☐

PHASE	OBSERVATION	YES	NO
3	**EVALUATION AND CONFIRMATION OF THEIR CAREER CHOICE** WRITE A REPORT		
	3.1 Describe their preferences, aptitudes and interests for the trade of draftsperson.	☐	☐
	3.2 Assess their career choice by comparing the different aspects and requirements of the trade with their own preferences, aptitudes and interests.	☐	☐
	TOTAL:		**/ 12**

Pass/fail conditions: **8** YESes out of **12,**

and a YES for components 1.1, 1.3, 2.3, 3.1 and 3.2

Comments:

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – SITUATIONAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED OUTCOME: Determine their suitability for the trade and the training process

5725 – The Trade and the Training Process (Module 1; 872 311)					Duration: 15 hours
Learning Context	**Duration (%)**	**Participation Indicators**	**Wgt. (%)**	**Participation Criteria**	**Wgt. (%)**
PHASE 1: Information on the Trade • Learning about the types of companies that employ industrial draftspersons and about the different types of work organization. • Describing factory production and the different jobs involved. • Learning about the nature and requirements of the job. • Examining trade-related tasks and operations. • Examining the skills and behaviours needed to practise the trade. • Presenting the information gathered and discussing their views on the trade (i.e. advantages, disadvantages, requirements) at a group meeting.	40	1. Gather information on most of the topics to be dealt with.	40	1.1 Gather relevant information on at least four topics related to the job market in the field of industrial drafting: - size of company - sector of economic activity - type of clientele - type of production - manufacturing processes - use of new types of equipment 1.2 Describe factory production and the different types of jobs involved: - research into new processes - design and drawing of products - design of transformation methods or processes - optimization of production, etc. 1.3 Present information related to the nature and requirements of the job: - specific requirements - duties and responsibilities - remuneration - opportunities for advancement, etc.	10 10 5

5725 – The Trade and the Training Process (Module 1; 872 311)					Duration: 15 hours
Learning Context	**Duration (%)**	**Participation Indicators**	**Wgt. (%)**	**Participation Criteria**	**Wgt. (%)**
				1.4 Present information on trade-related tasks and operations.	5
				1.5 Present information pertaining to the skills and behaviours needed to practise the trade.	5
				1.6 Present the information gathered and discuss their views on the trade (i.e. advantages, disadvantages, requirements) at a group meeting.	5
PHASE 2: Information on Training and Participation in the Training Process • Learning about the program of study and the training process. • Discussing the relevance of the program given the work situation. • Sharing their initial reactions to the program of study and the training process. • Learning about the concept of techno-watch and further training.	40	2. Express their views on the training program at a group meeting.	40	2.1 Learn about the program of study and the training process.	10
				2.2 Discuss the relevance of the program given the work situation.	15
				2.3 Share their initial reactions to the program of study and the training process.	10
				2.4 Learn about the concept of techno-watch and further training.	5

5725 – The Trade and the Training Process (Module 1; 872 311)					Duration: 15 hours
Learning Context	**Duration (%)**	**Participation Indicators**	**Wgt. (%)**	**Participation Criteria**	**Wgt. (%)**
PHASE 3: Evaluation and Confirmation of Their Career Choice • Producing a report in which they: - state their preferences, aptitudes and interests with respect to the trade - assess their career choice by comparing the different aspects and requirements of the trade with their own preferences, aptitudes and interests	20	3. Write a report.	20	3.1 Describe their preferences, aptitudes and interests for the trade of draftsperson. 3.2 Assess their career choice by comparing the different aspects and requirements of the trade with their own preferences, aptitudes and interests.	10 10

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INDUSTRIAL DRAFTING

5725

Solving Problems Related to Industrial Drafting

Module 2

872 324

THEORY EXAMINATION

INDUSTRIAL DRAFTING
5725
SOLVING PROBLEMS RELATED TO INDUSTRIAL DRAFTING
(Module 2)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to solve problems related to industrial drafting.

The problems given to candidates should be based on drawings related as closely as possible to real-life situations encountered in the workplace.
(Drawings pertaining to subsequent modules should be used.)

Each knowledge component should be evaluated using different drawings and questions unrelated to one another.

Since a calculator must be used, the examiner should inform the candidates that they must produce complete calculations for each of the problems. An answer without the accompanying calculations will not be accepted.
No course notes or unauthorized documents are allowed.

The suggested duration of the examination is three hours.

The examination should consist of a total of twenty questions, as follows:

Component 1.1

1. Convert a given dimension from the imperial system into the metric system.
2. Convert a given dimension from the metric system into the imperial system.

Component 2.1

For questions 3, 4 and 5:
- Solve an algebraic equation with one unknown.

Component 3.1

For questions 6, 7 and 8:
- Calculate a surface area: circular, rectangular, triangular, crown, etc.

Component 3.2

For questions 9, 10 and 11:
- Calculate the volume of a component.
  Note: Vary the shapes of the components.

Component 3.3

12. Calculate the mass of a component.

Component 4.1

13. Do the required trigonometric calculations to measure the linear distance using right-angled triangles.

14. Do the required trigonometric calculations to measure the linear distance using scalene triangles.

15. Do the required trigonometric calculations to find any angle using right-angled triangles.

16. Do the required trigonometric calculations to find any angle using scalene triangles.

17. Do the required trigonometric calculations to find a surface.

18. Do the required trigonometric calculations to find the volume of a component.

Component 5.1

19. Do the required calculations to find the gear ratio within a gear system.

20. Do the required calculations to find the power ratio within a system.

Minimum performance standard: 15 correct answers out of **20**

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Solve problems related to industrial drafting

5725 – Solving Problems Related to Industrial Drafting (Module 2; 872 324)						Duration: 60 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Knowledge Components**	**W_C**	**No. of Q.**
1. Determine the linear, curvilinear and surface dimensions of an object, with and without tolerances.	20	1. Method for converting dimensions	10	1.1 Accurate conversion between metric and imperial systems of measurement using a calculator	10	2
				Efficient use of the functions of a scientific calculator: basic operations, trigonometric functions, exponents, memory	-	
				Accurate conversion of distance and surface measurements	-	
		2. Methods for solving algebraic equations	15	2.1 Accurate calculations	15	3
				Proper application of geometric formulae	-	
				Comparison of results with determined reference measurements	-	
				Logical approach to problem solving	-	
2. Determine the mass of a component.	20	3. Geometric methods for calculating surface, volume and mass	35	3.1 Accurate calculation of surface area	15	3
				3.2 Accurate calculation of volume	15	3
				3.3 Accurate determination of mass	5	1
				Correct conversion of metric and imperial systems of measurement	-	
				Proper application of mathematical formulae	-	
				Efficient use of material density tables	-	
				Comparison of results with determined reference mass	-	
				Logical approach to problem solving	-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria
2000-10-03

5725 – Solving Problems Related to Industrial Drafting (Module 2; 872 324)						Duration: 60 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Knowledge Components**	**W_C**	**No. of Q.**
3. Calculate the dimensions of a triangular component.	40	4. Trigonometric methods for calculating distances, angles, surfaces and volumes	30	4.1 Accurate calculation of distances, angles, surfaces and volumes for right-angled and scalene triangles	30	6
				Application of Pythagoras' theorem and trigonometric functions to solve problems	-	
				Proper use of trigonometric formulae	-	
4. Calculate gear ratios and power ratios in a gear system.	20	5. Methods for calculating gear ratios and power ratios	10	5.1 Accurate calculation of dimensions in metric and imperial systems of measurement	10	2
				Proper application of algebraic formulae	-	
				Determination of the geometric characteristics of the object to be used in solving problems	-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria
2000-10-03

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INDUSTRIAL DRAFTING

5725

Interpreting Technical Drawings

Module 3

872 035

THEORY EXAMINATION

INDUSTRIAL DRAFTING
5725
INTERPRETING TECHNICAL DRAWINGS
(Module 3)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to interpret technical drawings.

The examiner should provide candidates with the detail drawings of a simple mechanism, as well as an assembly drawing on which the numbers used to identify the components are replaced by letters. However, the letters should not be in order. For example, the component identified by the number 1 in the list of terms should be represented by the letter "C", number 2 by "A", number 3 by "F", and so on.

No course notes or unauthorized documents are allowed.

The suggested duration of the examination is three hours.

The examination should consist of a total of 20 problems, as follows:

Component 1.1

1. Interpret standard lines representing contour lines, hidden contour lines and centre lines.
2. Interpret two materials represented by hatching lines.

Component 1.2

For questions 3, 4 and 5:
- Identify a component designated by a letter on the assembly drawing, given its name or number.

Component 1.3

6. Associate a line from one view to another on a detail drawing.
7. Associate a point on the line of one view to another on a detail drawing.
8. Associate one surface to another or to a line of one view to another on a detail drawing.

Component 2.1

9. Identify a dimension representing the total length of a component.
10. Identify the maximum dimension on a dimension with tolerances.
11. Identify the minimum dimension on a dimension with tolerances.

Component 3.1

For questions 12 and 13:
- Determine the value of a dimension represented by a letter on a detail drawing.

Component 4.1

14. Identify the information on the title block of a detail drawing or an assembly drawing.
15. Identify the information on the list of terms on an assembly drawing.
16. Identify the information in the annotations on a detail drawing.

Component 5.1

17. Interpret a symbol used on a detail drawing.
18. Interpret an abbreviation used on a detail drawing.

Component 6.1

For questions 19 and 20:

- Describe briefly the function of a component in the mechanism.

Minimum performance standard: 15 correct answers out of **20**

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Interpret technical drawings

5725 – Interpreting Technical Drawings (Module 3; 872 035)						Duration: 75 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Knowledge Components**	**W_C**	**No. of Q.**
1. Visualize a complete part.	35	Differentiation among the types of projections	-	Accurate differentiation among the types of projections: American and European orthographic projections, axonometric projections	-	
		1. Interpretation of drawings	40	Proper identification of views and sections	-	
				1.1 Accurate interpretation of lines and hatching lines	10	2
				1.2 Accurate identification of part on assembly drawing	15	3
				Accurate observations of the shape of the part and its position in the whole	-	
				Correct representation of the illustrated part in a second symmetrical part	-	
				1.3 Relevant association of lines, points and surfaces in different views	15	3
2. Interpret the dimensioning.	25	2. Identification of the information needed for the job	15	2.1 Identification of the information needed for the job: dimensions, dimensions with tolerances, form and positioning tolerances, backlash, nomenclature of threads, fit tolerances	15	3
		3. Determination of the value of the dimensions	10	3.1 Accurate determination of value of dimensions, dimensions with tolerances, form tolerances, positioning tolerances, backlash, size and location dimensions	10	2
		Interpretation of associations between the dimensions and the surfaces	-	Relevant associations between the dimensions and the surfaces of various views	-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria
2000-10-03

5725 – Interpreting Technical Drawings (Module 3; 872 035)						Duration: 75 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Knowledge Components**	**W_C**	**No. of Q.**
3. Find complementary information in technical drawings.	25	4. Identification of information needed	15	4.1 Proper identification of information in title block, list of terms used, annotations	15	3
				Thorough identification of information needed	-	
		5. Interpretation of symbols, codes and abbreviations	10	5.1 Accurate interpretation of symbols, codes and abbreviations	10	2
4. Determine the function of the components of an assembly.	15	6. Determination of the function of the components of an assembly	10	Thorough identification of the components of an assembly in an assembly drawing	-	
				Recognition of the characteristics of the components	-	
				6.1 Description of the function of each component of the assembly and its relationship with the other components	10	2

W_I: relative weighting of indicators; W_C: relative weighting of criteria
2000-10-03

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INDUSTRIAL DRAFTING

5725

Producing Sketches

Module 4

872 335

PRACTICAL EXAMINATION

INDUSTRIAL DRAFTING
5725
PRODUCING SKETCHES
(Module 4)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to produce sketches.

Candidates are required to sketch:
- orthographic projections of an object, from an isometric view
- an isometric view of an object, from orthographic projections

The suggested duration of the examination is four hours, divided as follows:
- orthographic projections (three hours)
- axonometric projection (one hour)

Candidates who fail must redo the entire examination.

2 Examination Procedure

2.1 Each candidate should be provided with:
- instructions on the task to be performed
- graph paper
- isometric graph paper
- the drawing of an isometric view of an object
- the drawing of orthographic projections of an object
- basic instruments (if required)

2.2 Steps in the examination procedure:

Step 1: Sketch:
- an isometric view
- orthographic projections

Step 2: On the orthographic projections, write in the dimensioning and the information required to manufacture the object.

EVALUATION FORM

INDUSTRIAL DRAFTING Program code: **5725**

4 – Producing Sketches Module code: **872 335**

Name of candidate: _____

School/centre: _____ Permanent code: _____

Date of examination: _____ RESULT: PASS ☐ FAIL ☐

Signature of examiner: _____

STEP	OBSERVATION			RESULT
1	**PRODUCTION OF SKETCHES**			
	1. SKETCHING OF ORTHOGRAPHIC PROJECTIONS			
	1.1 Conformity with drafting standards and conventions related to:	YES	NO	
	- types of conventional lines	☐	☐	
	Error tolerance: one error			
	- types of lines (fine, medium, heavy)	☐	☐	
	Error tolerance: one incorrect type of line, except for visible contour lines			
	- American and/or European projections	☐	☐	**0** or **15**
	1.2 Determination of the number and arrangement of views			**0** or **5**
	1.3 Observance of proportions and shapes of the object to be sketched			**0** or **5**
	Error tolerance: two errors			
	1.4 Accurate, clean lines			**0** or **5**
	2. SKETCHING OF AXONOMETRIC PROJECTIONS			
	2.1 Observance of proportions			**0** or **5**
	Error tolerance: one error			
	2.2 Accurate, neat sketch			**0** or **5**

STEP	OBSERVATION			RESULT
	3. SKETCHING OF SECTIONAL, AUXILIARY AND PARTIAL VIEWS			
	3.1 Conformity with drafting standards and conventions related to:	YES	NO	
	- types of conventional lines	☐	☐	
	Error tolerance: one error			
	- types of lines (fine, medium, heavy)	☐	☐	
	Error tolerance: two incorrect lines			
	- hatching lines	☐	☐	**0** or **15**
	3.2 Accurate, neat sketch			**0** or **5**
2	**ENTERING OF DIMENSIONING AND COMPLEMENTARY INFORMATION**			
	4. DIMENSIONING OF SKETCH			
	4.1 Conformity with drafting standards and conventions related to:	YES	NO	
	- extension lines	☐	☐	
	- dimension lines	☐	☐	
	- conventional dimensioning (style and arrangement)	☐	☐	**0** or **15**
	4.2 Neat, clear dimensioning			**0** or **10**
	Error tolerance: two errors			
	5. ENTERING OF ANNOTATIONS AND INFORMATION IN THE TITLE BLOCK			
	5.1 Entering of all the information needed to manufacture the object			**0** or **10**
	Error tolerance: two errors			
	5.2 Neatness of annotations and information in the title block			**0** or **5**
			Total:	**/ 100**

Minimum performance standard: 70 points

Comments:

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Produce sketches

5725 – Producing Sketches (Module 4; 872 335)						Duration: 75 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
1. Sketch orthographic projections.	30	1. Sketching of orthographic projections	30	1.1 Conformity with drafting standards and conventions	15	PT
				Accurate identification of dimensions of part to be sketched	-	
				1.2 Determination of the number and arrangement of views	5	PT
				1.3 Observance of proportions and shapes of the object to be sketched	5	PT
				Proper application of sketching techniques	-	
				1.4 Accurate, clean lines	5	PT
2. Sketch axonometric projections.	15	2. Sketching of axonometric projections	10	Conformity with drafting standards and conventions	-	
				Accurate identification of dimensions of part to be sketched	-	
				2.1 Observance of proportions	5	PT
				Observance of shapes of the object to be sketched using skewed lines and ellipses	-	
				Observance of sketching techniques	-	
				2.2 Accurate, neat sketch	5	PT
3. Sketch sectional, auxiliary and partial views.	25	3. Sketching of sectional, auxiliary and partial views	20	3.1 Conformity with drafting standards and conventions	15	PT
				Appropriate choice of section	-	
				Observance of proportions and shapes of the object to be sketched	-	
				Observance of sketching techniques	-	
				3.2 Accurate, neat sketch	5	PT

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

5725 – Producing Sketches (Module 4; 872 335)						Duration: 75 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
4. Dimension the sketch.	25	4. Dimensioning of sketch	25	4.1 Conformity with drafting standards and conventions	15	PT
				Proper arrangement of dimensions	-	
				Dimensioning adapted to manufacturing	-	
				Appropriate tolerance limits and surface finishes according to the role of the part or one of its components	-	
				Proper use of symbols	-	
				Proper use of metric and imperial systems of measurement	-	
				4.2 Neat, clear dimensioning	10	PT
5. Write the annotations and information in the title block.	5	5. Entering of annotations and information in the title block	15	5.1 Entering of all the information needed to manufacture the object	10	PT
				Clarity and concision of notes	-	
				Annotations adapted to manufacturing	-	
				Proper use of metric and imperial systems of measurement	-	
				5.2 Neatness of annotations and information in the title block	5	PT

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

Québec
Ministère
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INDUSTRIAL DRAFTING

5725

Working at a Computerized Workstation

Module 5

872 345

PRACTICAL EXAMINATION

INDUSTRIAL DRAFTING
5725
WORKING AT A COMPUTERIZED WORKSTATION
(Module 5)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to work at a computerized workstation.

The suggested duration of this examination is four hours.

2 Examination Procedure

2.1 Each candidate should be provided with:

- instructions on the tasks to be performed
- a blank diskette for Step 1
- a diskette with a:
  - > text document (for Step 2)
  - > document to be compressed (for Step 2)
  - > document to be decompressed (for Step 2)
  - > text document (for Step 3)
- a two-page printed document, representing the final product required in Step 3
- a document representing the final product required in Step 4, as well as the information necessary for its creation
- a formatted diskette for Step 5

2.2 Steps in the examination procedure:

Step 1: Format a blank diskette, copying the system folder and identifying the diskette with a name.

Step 2:

- Copy into a drawing document (created with a CAD-type program) a paragraph of text from a file created with a word processor, such as Notepad.
  THE EXAMINER MUST BE PRESENT WHILE THIS TASK IS BEING PERFORMED.

- On a diskette, create a folder titled "IMAGES", along with two subdirectories titled "GIF" and "JPG".

- Copy the folder titled "AUTOEXEC.BAT" located in the main directory of the hard disk onto a diskette and rename the copy "AUTO.TXT".

- Compress a file saved on a diskette.
- Decompress a file saved on a diskette.

Step 3: Complete a two-page document, making the necessary modifications:
- format the document with the specified margins and text alignments
- make a total of ten character modifications in the text, as specified: "fonts", "styles" and "attributes"
- create the table, as specified
- insert page numbers

Step 4: Create a spreadsheet document:
- create a spreadsheet with automatic calculations

Example:

	Monday	Tuesday	Wednesday	Thursday	Friday	HOURS
Drawing 1	3	4.5	5	3.5	2	**18**
Drawing 2	5	3.5	3	4.5	6	**22**

TOTAL: **40**

Use antivirus software in order to check:
- the contents of a diskette
- a file stored on the hard disk
  THE EXAMINER MUST BE PRESENT WHILE THIS TASK IS BEING PERFORMED.

Step 5: Use the Internet and a browser:
- create a "FAVOURITES" file titled "MY LINKS" and copy into it two active links
- send an electronic mail message
  THE EXAMINER MUST BE PRESENT WHILE THIS TASK IS BEING PERFORMED.
- save a Web page on a diskette with its pictures to allow for viewing off-line
- print the above Web page

EVALUATION FORM

INDUSTRIAL DRAFTING Program code: **5725**

5 – Working at a Computerized Workstation Module code: **872 345**

Name of candidate: _____

School/centre: _____ Permanent code: _____

Date of examination: _____ RESULT: PASS ☐ FAIL ☐

Signature of examiner: _____

STEP	OBSERVATION			RESULT
1	**PREPARATION OF WORKSTATION**			
	1. PREPARATION OF A DISKETTE			
	1.1 Appropriate formatting of a diskette by:	YES	NO	
	- copying onto it the system folder	☐	☐	
	- assigning a name to the diskette	☐	☐	**0** or **10**
2	**USE OF THE BASIC FUNCTIONS OF AN OPERATING SYSTEM**			
	2. USE OF AN OPERATING SYSTEM			
	2.1 Observance of proper procedure for navigating between and transferring data from one program to another:	YES	NO	
	- using the appropriate functions for copying a paragraph from a word processing application, such as Notepad, Wordpad or Word, into a drawing application such as AutoCAD	☐	☐	**0** or **10**
	2.2 Proper use of the main functions of file management programs for various types of storing devices:	YES	NO	
	- creating on a diskette a folder containing two subdirectories, as required	☐	☐	
	- copying a file from a hard disk onto a diskette and assigning a name to the new file, as required	☐	☐	**0** or **15**

STEP	OBSERVATION			RESULT
	3. USE OF COMPRESSING PROGRAMS			
	3.1 Observance of proper procedure for compressing and decompressing files:	YES	NO	
	- correctly compressing a file	☐	☐	
	- correctly decompressing a file	☐	☐	**0** or **5**
3	**PRODUCTION OF A SHORT DOCUMENT USING WORD PROCESSING SOFTWARE**			
	4. USE OF WORD PROCESSING SOFTWARE			
	4.1 Use of appropriate commands to:	YES	NO	
	- format text	☐	☐	
	- edit text	☐	☐	
	Error tolerance: two omissions			
	- create a table	☐	☐	
	- number pages	☐	☐	**0** or **20**
4	**PRODUCTION OF A DOCUMENT USING SPREADSHEET SOFTWARE**			
	5. USE OF SPREADSHEET SOFTWARE			
	5.1 Use of appropriate commands to:	YES	NO	
	- create a spreadsheet	☐	☐	
	- perform calculations	☐	☐	**0** or **15**
	6. USE OF ANTIVIRUS SOFTWARE			
	6.1 Use of appropriate anti-virus software commands to:	YES	NO	
	- check the contents of a diskette	☐	☐	
	- check a file stored on the hard disk	☐	☐	**0** or **5**

STEP	OBSERVATION			RESULT
5	**USE OF THE INTERNET**			
	7. USE OF BROWSER SOFTWARE			
	7.1 Observance of proper procedure for creating a "favourites" file:	YES	NO	
	- creation of a "Favourites" file as required	☐	☐	
	- addition of two active links to the "Favourites" file	☐	☐	**0** or **5**
	7.2 Observance of proper procedure for processing electronic mail			**0** or **5**
	7.3 Observance of proper procedure for downloading and printing text, drawings and pictures:	YES	NO	
	- saving a Web page and downloading its pictures onto a diskette to allow for complete viewing off-line	☐	☐	
	Error tolerance: failure to download one picture out of five			
	(A counter on a Web page should not be included.)			
	- printing the contents of Web page	☐	☐	**0** or **10**
			Total:	**/ 100**

Minimum performance standard: 70 points

Comments:

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Work at a computerized workstation

5725 – Working at a Computerized Workstation (Module 5; 872 345)						Duration: 75 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
1. Prepare the workstation.	5	Preparation of workstation	-	Accurate identification of the components of a computerized workstation	-	
				Accurate location and identification of computer components and peripheral devices	-	
				Methodical checking of connections	-	
				Functional and ergonomic organization of the workstation	-	
		1. Preparation of diskettes	10	1.1 Appropriate formatting of a diskette	10	PT
2. Use the basic functions of an operating system.	25	2. Use of an operating system	25	Appropriate use of the main functions of a graphical environment, such as windows, dialogue boxes, menus, toolbars and scroll bars	-	
				Observance of proper procedure for creating, saving and printing documents	-	
				2.1 Observance of proper procedure for navigating between and transferring data from one program to another	10	PS
				2.2 Proper use of the main functions of file management programs for various types of storing devices: hard disks, diskettes and CD-ROMs	15	PT

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

5725 – Working at a Computerized Workstation (Module 5; 872 345)						Duration: 75 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
		3. Use of compressing programs	5	3.1 Observance of proper procedure for compressing and decompressing files	5	PT
		Personalization of the work environment	-	Appropriate personalization of the graphical environment of the operating system as required	-	
		Observance of procedure for ending a work session	-	Observance of proper procedure for closing down the computer after a work session	-	
3. Solve problems within program using Help function.	5	Solution of problems within the program	-	Effective searching	-	
				Appropriate interpretation and application of solutions	-	
				Accurate interpretation of technical terms used in English-language software	-	
4. Produce a short document using word processing software.	25	4. Use of word processing software	20	Appropriate selection of standard and page layout tools, according to function	-	
				4.1 Use of appropriate commands to modify and format text, number pages, create a table, use the dictionary, insert page breaks and section breaks	20	PT

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

5725 – Working at a Computerized Workstation (Module 5; 872 345)						Duration: 75 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
5. Produce a document using spreadsheet software.	15	5. Use of spreadsheet software	15	Appropriate selection of standard and page layout tools, according to function	-	
				5.1 Use of appropriate commands to create a spreadsheet; copy and move cells; enter and copy data; modify data, rows and columns; perform calculations	15	PT
		6. Use of antivirus software	5	6.1 Use of appropriate anti-virus software commands	5	PS
6. Use the Internet.	25	7. Use of browser software	20	Selection of appropriate functions of browser software	-	
				Efficient browsing to find information	-	
				7.1 Observance of proper procedure for creating a "Favourites" file	5	PT
				7.2 Observance of proper procedure for processing electronic mail	5	PT
				7.3 Observance of proper procedure for downloading and printing text, drawings and pictures	10	PT

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

Québec
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INDUSTRIAL DRAFTING

5725

Producing Detail Drawings of Mechanical Components

Module 6

872 356

PRACTICAL EXAMINATION

INDUSTRIAL DRAFTING
5725
PRODUCING DETAIL DRAWINGS OF MECHANICAL COMPONENTS
(Module 6)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to produce detail drawings of mechanical components.

The examination is divided into two parts, as follows:

Part 1: - Reproducing the drawing of a template
  Note: The drawing to be reproduced should allow for the creation and insertion of a block.

Part 2: - Creating an orthographic projection of a simple component, shown in an axonometric view
  Note: The component should allow the candidate to draw a sectional view and a simple auxiliary view.

No course notes or other relevant documents are allowed.

The suggested duration of the examination is six hours: one hour for the template
five hours for the detail drawing

2 Examination Procedure

2.1 Each candidate should be provided with:
- instructions on the work to be done
- a drawing of a fully dimensioned template
- steps to follow, as well as the commands to be used to draw the template
- an axonometric view of the fully dimensioned drawing of the component to be drawn (Step 2)
- a diskette for Step 3 of Part Two

2.2 Steps in the examination procedure:

Part 1 Step 1: Produce the drawing of a template according to the steps to be followed.

Part 2 Step 1: Produce the detail drawing of the component to be manufactured:
- exterior views
- sectional view(s)
- auxiliary view(s)

Step 2: Write in the dimensions and any necessary information for the component to be manufactured.
Identify five surfaces to be machined, using the appropriate symbols.

Step 3: File drawings on the diskette.
Print drawings.

EVALUATION FORM

INDUSTRIAL DRAFTING Program code: **5725**

6 – Producing Detail Drawings of Mechanical Components Module code: **872 356**

Name of candidate: _____

School/centre: _____ Permanent code: _____

Date of examination: _____ RESULT: PASS ☐ FAIL ☐

Signature of examiner: _____

STEP	OBSERVATION			RESULT
	PART 1: DRAWING OF TEMPLATES			
1	**DRAWING OF EXTERIOR VIEWS**			
	1. DRAWING TEMPLATES			
	1.1 Appropriate and optimum use of basic software commands, including commands to create and insert blocks:	YES	NO	
	- correct reproduction of template drawing	☐	☐	
	- creation and insertion of blocks as required	☐	☐	**0** or **10**
	PART 2: DETAIL DRAWINGS			
1	**EXTERIOR, SECTIONAL AND AUXILIARY VIEWS OF A DETAILED COMPONENT**			
	2. EXTERIOR VIEWS OF A DETAILED COMPONENT			
	2.1 Appropriate arrangement of exterior views			**0** or **5**
	2.2 Concordance of different exterior views			**0** or **5**
	2.3 Conformity of exterior views with initial data			**0** or **10**
	3. SECTIONAL VIEWS OF A DETAILED COMPONENT			
	3.1 Appropriate arrangement of sectional views			**0** or **5**
	3.2 Correspondence between sectional views and exterior views			**0** or **10**
	3.3 Use of standard symbols to indicate materials			**0** or **5**
	3.4 Arrangement of details in conformity with data on the preliminary drawing			**0** or **5**
	4. AUXILIARY VIEWS OF A DETAILED COMPONENT			
	4.1 Appropriate arrangement of auxiliary views			**0** or **5**
	4.2 Correspondence between auxiliary views and exterior views			**0** or **10**

STEP	OBSERVATION			RESULT
2	**ENTERING OF DIMENSIONS AND ADDITIONAL INFORMATION**			
	5. DIMENSIONS AND ADDITIONAL INFORMATION			
	5.1 Observance of dimensioning standards with regards to:	YES	NO	
	- positioning of dimensions and dimension lines	☐	☐	
	Error tolerance: two location errors or omissions			
	- font size	☐	☐	**0** or **10**
	5.2 Accurate use of symbols:	YES	NO	
	- identification of five surfaces to be machined using the appropriate symbols	☐	☐	**0** or **5**
3	**PRINTING AND FILING OF DRAWINGS**			
	6. PROCEDURE FOR PRINTING DRAWINGS			
	6.1 Determination of appropriate parameters for printing:	YES	NO	
	- the template	☐	☐	
	- the detail drawing	☐	☐	**0** or **5**
	6.2 Line thickness in accordance with drafting conventions:	YES	NO	
	- for the template	☐	☐	
	- for the detail drawing	☐	☐	**0** or **5**
	7. PROCEDURE FOR FILING DRAWINGS			
	7.1 Use of appropriate commands for filing drawings on a diskette:	YES	NO	
	- correct filing of template drawing	☐	☐	
	- correct filing of detail drawing	☐	☐	**0** or **5**
		Total:		**/ 100**

Minimum performance standard: 75 points

Comments:

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Produce detail drawings of mechanical components

5725 – Producing Detail Drawings of Mechanical Components (Module 6; 872 356)						Duration: 90 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
1. Organize the work.	5	Interpretation of preliminary drawings	-	Accurate interpretation of lines, notes and dimensions in the preliminary drawing	-	
				Appropriate selection of views, sections and auxiliary views	-	
		Preparation of workstation	-	Appropriate preparation of the computerized workstation	-	
		Selection of work procedure	-	Appropriate definition of parameters for the electronic document complying with the system of measurement indicated	-	
				Appropriate layout sketch showing the component and relevant views	-	
2. Draw exterior views of component.	25	1. Drawing of templates	10	1.1 Appropriate and optimum use of basic software commands, including commands to create and insert blocks	10	PT
		2. Exterior views of a detailed component	20	2.1 Appropriate arrangement of exterior views	5	PT
				2.2 Concordance of different exterior views	5	PT
				2.3 Conformity of exterior views with initial data	10	PT
				Arrangement of details in conformity with dimensions on preliminary drawing	-	
				Observance of drawing conventions	-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

5725 – Producing Detail Drawings of Mechanical Components (Module 6; 872 356)					Duration: 90 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C** / **STR**
3. Draw sectional views.	20	3. Sectional views of a detailed component	25	3.1 Appropriate arrangement of sectional views	5 PT
				Concordance between the different sectional views	-
				3.2 Correspondence between sectional views and exterior views	10 PT
				3.3 Use of standard symbols to indicate materials	5 PT
				3.4 Arrangement of details in conformity with the data on the preliminary drawing	5 PT
				Observance of drawing conventions and standards	-
				Appropriate use of basic CAD software commands	-
4. Draw auxiliary views.	20	4. Auxiliary views of a detailed component	15	Correct selection of auxiliary views	-
				4.1 Appropriate arrangement of auxiliary views	5 PT
				Concordance between the different auxiliary views	-
				4.2 Correspondence between auxiliary views and exterior views	10 PT
				Arrangement of details in conformity with the dimensions on the preliminary drawing	-
				Observance of drawing conventions	-
				Appropriate use of basic CAD software commands	-

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

5725 – Producing Detail Drawings of Mechanical Components (Module 6; 872 356)							Duration: 90 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**		**W_C**	**STR**
5. Enter dimensions and additional information.	15	5. Dimensions and additional information	15	Accurate calculation of dimensions		-	
				5.1	Observance of dimensioning standards	10	PT
				5.2	Accurate use of symbols	5	PT
6. Check the drawing.	5	Checking and correcting of drawing	-	Observance of procedure for checking and approving drawing		-	
				Observance of procedure for checking drawing and making any necessary corrections to ensure conformity with initial data		-	
7. Print drawings using a plotter.	5	6. Procedure for printing drawings	10	Appropriate preparation of materials and plotter		-	
				6.1	Determination of appropriate parameters	5	PS
				Correspondence between parameters and finished print		-	
				6.2	Line thickness in accordance with drafting conventions	5	PT
8. File documents.	5	7. Procedure for filing drawings	5	7.1	Use of appropriate commands for filing drawings	5	PT
				Appropriate selection of filing method		-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

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INDUSTRIAL DRAFTING

5725

Illustrating Fasteners

Module 7

872 364

- **THEORY EXAMINATION**
and
- **PRACTICAL EXAMINATION**

INDUSTRIAL DRAFTING
5725
ILLUSTRATING FASTENERS
(Module 7)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to illustrate fasteners.
No course notes or other documents are allowed.

The examination is divided into two parts to allow candidates to work on several drawings. Candidates must:

Part 1:
- Identify five different fasteners illustrated, using the reference documents provided and metric and imperial systems of measurement.
- Indicate three characteristics for each of the five different fasteners, using the reference documents provided and metric and imperial systems of measurement.

Part 2:
- Complete assembly drawings in orthographic projection by representing the different fasteners in compliance with the three usual methods of representation (i.e. pictorial, schematic and simplified), using a computerized workstation and drawing software such as AutoCAD.

The suggested duration of the examination is three hours.

2 Additional Information on the Theory Examination (Part 1)

The examination should consist of a total of ten problems, as follows:

Component 1.1

For questions 1 to 5:
- Identify fasteners, according to the illustration.

Component 2.1

For questions 6 to 10:
- Indicate the three features missing from each fastener, according to the designation.

Minimum performance standard: 7 correct answers out of **10**

3 Examination Procedure: Practical Examination (Part 2)

3.1 Each candidate should be provided with:

- instructions on the task to be performed
- plans of drawings in orthographic projections to be completed (on printed copy and ".DWG" format)
- all necessary reference materials

Note: Candidates should have access to an electronic library.

3.2 Steps in the procedure:

Step 1: Complete the assembly drawings in orthographic projections to illustrate fasteners, as required.

Step 2: - Indicate dimensions for the operations to be carried out for the fasteners.
- Enter any additional information.

EVALUATION FORM

INDUSTRIAL DRAFTING Program code: **5725**

7 – Illustrating Fasteners Module code: **872 364**

Name of candidate: _____

School/centre: _____ Permanent code: _____

Date of examination: _____ RESULT: PASS ☐ FAIL ☐

Signature of examiner: _____

FINAL OBSERVATION			RESULT
The candidate has successfully completed:	YES	NO	
- the theory examination (Part 1)	☐	☐	
- the practical examination (Part 2)	☐	☐	**P** or **F**

Comments:

STEP	OBSERVATION			RESULT
	PART 2: PRACTICAL EXAMINATION			
1	**DRAWING OF FASTENERS**			
	3. ILLUSTRATION OF FASTENERS			
	3.1 Accuracy of drawing and use of symbols:	YES	NO	
	- accurate shapes and dimensions of the fasteners represented	☐	☐	
	Error tolerance: one error or inaccuracy			
	- accuracy of pictorial representation	☐	☐	
	- accuracy of schematic representation	☐	☐	
	- accuracy of simplified representation	☐	☐	**0** or **30**
	3.2 Observance of drawing standards and conventions			**0** or **5**
2	**INDICATION OF DIMENSIONS AND ADDITIONAL INFORMATION**			
	4. DIMENSIONS AND ADDITIONAL INFORMATION			
	4.1 Accurate dimensions, in compliance with standards:	YES	NO	
	- accuracy of bolt hole diameter and of the operation to be carried out, such as milling or counterboring	☐	☐	
	Error tolerance: one error			
	- accuracy of tapping hole dimensions and tapping, if necessary	☐	☐	**0** or **20**
	Error tolerance: one error			
	4.2 Uniform identification:	YES	NO	
	- using metric or imperial measurements	☐	☐	
	- in French or in English, free of spelling mistakes	☐	☐	**0** or **5**
			Total:	**/ 60**

Minimum performance standard: 35 points

Comments: _____

_____

_____

_____

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Illustrate fasteners

5725 – Illustrating Fasteners (Module 7; 872 364)						Duration: 60 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Knowledge Components**	**W_C**	**No. of Q.**
1. Identify fasteners on a drawing or an existing mechanism.	20	1. Designation of fasteners	20	1.1 Proper designation of fasteners in French and English	20	5
		Classification of fasteners	-	Correct classification of fasteners by form and use	-	
2. Search for features of different fasteners in technical documentation.	10	2. Location of information in technical documents	20	Efficient location of information.	-	
				2.1 Accurate identification of features	20	5
				Accuracy of terminology, abbreviations and standard codes	-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

5725 – Illustrating Fasteners (Module 7; 872 364)							Duration: 60 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**		**W_C**	**STR**
3. Draw fasteners.	55	Accuracy of calculations	-	Accurate calculations		-	
		3. Illustration of fasteners	35	3.1	Accuracy of drawing and use of symbols	30	PT
				3.2	Observance of drawing standards and conventions	5	PT
				Optimum use of software commands		-	
4. Download fasteners from an electronic library.	5	Use of an electronic library	-	Correct selection of fasteners from library according to the needs of the drawing, whether pictorial, schematic or simplified		-	
				Optimum use of software commands		-	
				Downloading of fastener, making sure to maintain correct scale of drawing		-	
5. Indicate dimensions and additional information.	10	4. Dimensions and additional information	25	4.1	Accurate dimensions, in compliance with standards	20	PT
				Observance of identification standards for indicating fasteners		-	
				4.2	Uniform identification, using metric or imperial measurements, in English or in French	5	PT

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

Québec
Ministère
de l'Éducation

INDUSTRIAL DRAFTING

5725

Illustrating the Arrangement of Components

Module 8

872 373

PRACTICAL EXAMINATION

INDUSTRIAL DRAFTING
5725
ILLUSTRATING THE ARRANGEMENT OF COMPONENTS
(Module 8)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to illustrate the arrangement and movement of the components of a mechanism comprised of five to ten components, according to their complexity.
Note: The examiner should ensure a balanced mixture of static and dynamic components.

Candidates must:
- draw a mechanism, illustrating the movements in sketch form and identifying the components
- give a logical description of the role of the static and dynamic components in the mechanism

The suggested duration of the examination is three hours.

2 Examination Procedure

2.1 Each candidate should be provided with:
- instructions on the work to be done
- work sheets to complete (for Step 4)
- plans of detail drawings in orthographic projection (components not numbered)
- all necessary sheets to do the sketch

2.2 Steps in the procedure:

Step 1: Sketch the mechanism in exploded view, respecting the forms and proportions of the components.

Step 2: Illustrate the movements of the dynamic components in sketch form.
Note: Can be done directly on the exploded view.

Step 3: Complete the detail drawings of the mechanism by writing in the number of each component in a logical manner.

Step 4: Complete the work sheet and enter the name of each component and its respective role in the mechanism.

THE ROLE OF STATIC COMPONENTS

Give a logical description of the static role of each component in the mechanism.

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

***Error tolerance*: one illogical, incomplete or missing designation**

THE ROLE OF DYNAMIC COMPONENTS

Give a logical description of the dynamic role of each component in the mechanism.

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

_____

_____

_____

_____

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

_____

_____

_____

_____

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

_____

_____

_____

_____

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

_____

_____

_____

_____

COMPONENT No. ____ NAME OF COMPONENT _____

Role and description:

_____

_____

_____

_____

***Error tolerance*: one illogical, incomplete or missing designation**

EVALUATION FORM

INDUSTRIAL DRAFTING Program code: **5725**

8 – Illustrating the Arrangement of Components Module code: **872 373**

Name of candidate: _____

School/centre: _____ Permanent code: _____

Date of examination: _____ RESULT: PASS ☐ FAIL ☐

Signature of examiner: _____

STEP	OBSERVATION			RESULT
1	**REPRESENTATION OF THE POSITION AND ORIENTATION OF COMPONENTS AND FASTENERS** 3. ARRANGEMENT OF COMPONENTS 3.1 Precise determination of the position and orientation of each component:	YES	NO	
	- correct position and orientation of components	☐	☐	
	Error tolerance: one incorrect or missing component			
	- compliance with the forms and proportions of the various components in the mechanism	☐	☐	**0** or **25**
	Error tolerance: one incorrect component			
2	**REPRESENTATION OF THE MOVEMENT OF EACH COMPONENT** 5. RELATIONSHIPS BETWEEN COMPONENTS 5.1 Clarity of sketch representing movements			**0** or **10**
	Error tolerance: one incorrect or missing movement			
3	**IDENTIFICATION OF THE COMPONENTS IN THE MECHANISM** 1. IDENTIFICATION OF COMPONENTS 1.1 Precise differentiation of the various types of components:	YES	NO	
	- logical numbering of components	☐	☐	**0** or **15**

STEP	OBSERVATION	RESULT
4	**REPRESENTATION OF THE POSITION AND ORIENTATION OF COMPONENTS AND FASTENERS** 2. ROLE OF STATIC COMPONENTS 2.1 Logical description of the static role of each component in the mechanism *Error tolerance*: one illogical, incomplete or missing designation	**0** or **25**
	REPRESENTATION OF THE MOVEMENT OF EACH COMPONENT IN THE MECHANISM 4. ROLE OF DYNAMIC COMPONENTS 4.1 Logical description of the dynamic role of each component in the mechanism *Error tolerance*: one illogical, incomplete or missing designation	**0** or **25**
	Total:	**/ 100**

Minimum performance standard: 80 points

Comments:

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Illustrate the arrangement and movement of the components of a mechanism

5725 – Illustrating the Arrangement of Components (Module 8; 872 373)						Duration: 45 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
1. Identify the components of a mechanism.	10	1. Identification of components	15	1.1 Precise differentiation of the various types of components	15	PT
				Correct grouping of components by form and dimension	-	
2. Represent the position and orientation of components and fasteners.	40	2. Role of static components	20	2.1 Logical description of the static role of each component in the mechanism	25	PT
		3. Arrangement of components	30	3.1 Precise determination of the position and orientation of each component.	25	PT
				Accuracy of the sagittal graph representing assemblies and subassemblies	-	
3. Represent component movement.	35	4. Role of dynamic components	25	4.1 Logical description of the dynamic role of each component in the mechanism	25	PT
		5. Relationships between components	10	Correct determination of the relationships between components	-	
				5.1 Clarity of sketch representing movements	10	PT
4. Represent the relationship between the components in a perspective sketch.	15	Accuracy of sketch	-	Accuracy of proportions	-	
		Positioning of components represented	-	Exact positioning of components in sketch	-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

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INDUSTRIAL DRAFTING

5725

Interpreting Technical Information About Materials and Manufacturing Processes

Module 9

872 386

THEORY EXAMINATION

INDUSTRIAL DRAFTING
5725
INTERPRETING TECHNICAL INFORMATION ABOUT MATERIALS AND MANUFACTURING PROCESSES
(Module 9)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to interpret technical information about materials and manufacturing processes.
No course notes or other documents are allowed.

The suggested duration of the examination is three hours.
The examination should consist of a total of twenty problems, as follows:

Component 1.1

For questions 1, 2 and 3:
- Identify the types of materials that make up the component.

Component 1.2

For questions 4, 5 and 6:
- Interpret Canadian, American and international material identification codes.

Component 2.1

7- Calculate the resistance of the materials for a simple component.

Component 3.1

For questions 8 and 9:
- Interpret finishing symbols.

Component 3.2

For questions 10 and 11:
- Associate surface finishes with their corresponding tolerances.

Component 4.1

For questions 12, 13 and 14:
- Identify the following processes: moulding, machining and welding.

Component 5.1

For questions 15, 16, 17 and 18:
- Establish the links between the processes and the machine tools used.

Component 5.2

For questions 19 and 20:
- Establish the links between the manufacturing process and the required degree of precision and surface finish.

Minimum performance standard: 14 correct answers out of **20**

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Interpret technical information about materials and manufacturing processes

5725 – INTERPRETING TECHNICAL INFORMATION ABOUT MATERIALS AND MANUFACTURING PROCESSES (Module 9; 872 386) — Duration: 90 hours

Specifications of the Expected Behaviour	Duration (%)	Performance Indicators	W_I	Knowledge Components	W_C	No. of Q.
1. Describe the materials specified in technical drawings.	15	1. Identification of materials	30	1.1 Proper identification of the types of materials used to make components	15	3
				Accurate reading of the physical, mechanical and chemical properties of materials, as found in technical documentation	-	
				1.2 Accurate interpretation of Canadian, American and international material identification codes	15	3
		Interpretation of tables and reference tables	-	Accurate interpretation of working stresses as defined in tables	-	
		2. Methods for calculating the resistance of the materials	5	2.1 Calculation of the resistance of the materials for a simple component	5	1
2. Recognize types of surface finishes and component tolerances.	10	3. Interpretation of surface finish symbols	20	3.1 Accurate interpretation of symbols	10	2
				3.2 Correct association between surface finishes and corresponding tolerances	10	2
3. Differentiate among processing methods presented in the documentation.	20	4. Major processing methods	15	4.1 Correct recognition of the features of moulding, shaping, machining, welding, assembling and sintering processes	15	3
				Appropriate establishment of links between processing methods and applications in various fields	-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria
2000-10-03

5725 – INTERPRETING TECHNICAL INFORMATION ABOUT MATERIALS AND MANUFACTURING PROCESSES (Module 9; 872 386) — Duration: 90 hours

Specifications of the Expected Behaviour	Duration (%)	Performance Indicators	W_I	Knowledge Components	W_C	No. of Q.
4. Establish links between the drawn object and its manufacture.	55	5. Understanding of processing methods	30	5.1 Relevant links between processes and the machine tools used	20	4
				Relevant links between the features of a process and the limits on using a given material	-	
				5.2 Relevant links between the manufacturing process and the required degree of precision and surface finish	10	2
				Relevant links between surface finishes and thermal treatments	-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria
2000-10-03

Québec
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INDUSTRIAL DRAFTING

5725

Producing Assembly Drawings

Module 10

872 395

PRACTICAL EXAMINATION

INDUSTRIAL DRAFTING
5725
PRODUCING ASSEMBLY DRAWINGS
(Module 10)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to produce an assembly drawing. The drawing should consist of components to be manufactured and commercially available components (with a maximum of fifteen components).
Candidates may use a calculator, class notes, an electronic library and other relevant documents. However, the use of drawings produced during the training process is not permitted.

The suggested duration of the examination is six hours.

2 Examination Procedure

2.1 Each candidate should be provided with:
- instructions on the work to be done
- drawings of components to be manufactured and of commercially available components
- a sheet containing technical data (to accompany the drawings)
- a diskette for Step 5

2.2 Candidates must produce an assembly drawing made up of components to be manufactured and commercially available components, using a computerized workstation and drawing software such as AutoCAD.

2.3 Steps in the procedure:

Step 1: Determine the orientation of the drawing of the mechanism on an A2 or C sheet, as well as the views required to represent the mechanism.

Step 2: Draw the components to be manufactured and the commercially available components in compliance with dimensions, scale and technical data.

Step 3: Enter the dimensions and necessary information:
- designation of components
- notes, names and title block

Step 4: Check and make any necessary corrections.

Step 5: With the examiner present, file the drawing on a diskette in .DWG and .DWF formats.
Print the drawing.

EVALUATION FORM

INDUSTRIAL DRAFTING Program code: **5725**

10 – Producing Assembly Drawings Module code: **872 395**

Name of candidate: _____

School/centre: _____ Permanent code: _____

Date of examination: _____ RESULT: PASS ☐ FAIL ☐

Signature of examiner: _____

STEP	OBSERVATION			RESULT
1	**ORGANIZATION OF WORK**			
	1. OBSERVANCE OF ASSEMBLY DRAWING STANDARDS AND CONVENTIONS			
	1.1 Appropriate orientation of the drawing of the mechanical system on the page			**0** or **5**
	1.2 Appropriate determination of views required to represent the mechanism:	YES	NO	
	- appropriate selection of views	☐	☐	
	- appropriate arrangement of views in conformity with common drafting conventions	☐	☐	**0** or **10**
2	**DRAWING OF COMMERCIALLY AVAILABLE COMPONENTS AND COMPONENTS TO BE MANUFACTURED**			
	2. DRAWING OF COMPONENTS TO BE MANUFACTURED			
	2.1 Exact fit of components			**0** or **15**
	Error tolerance: one positioning or orientation error			
	3. DRAWING OF COMMERCIALLY AVAILABLE COMPONENTS			
	3.1 Exact fit of components			**0** or **15**
	Error tolerance: one positioning or orientation error			
3	**INSERTING OF DIMENSIONS AND ADDITIONAL INFORMATION**			
	4. DIMENSIONS AND ADDITIONAL INFORMATION			
	4.1 Accurate and exhaustive list of components			**0** or **15**
	Error tolerance: three errors (not counting spelling mistakes)			

STEP	OBSERVATION			RESULT
	4.2 Accurate entry of assembly information:	YES	NO	
	- accurate identification of components in conformity with initial data	☐	☐	**0** or **5**
	4.3 Correct completion of title block			**0** or **5**
	Error tolerance: one omission (not counting spelling mistakes)			
	4.4 Consistent language, free of spelling mistakes (French/English)			**0** or **5**
	Error tolerance: two spelling mistakes			
4	**CHECKING OF DRAWING**			
	5. CHECKING AND CORRECTING OF DRAWING			
	5.1 Conformity of drawing with the dimensions, scale and initial data concerning:	YES	NO	
	- the components to be manufactured	☐	☐	
	Error tolerance: two errors or omissions			
	- the drawing of commercially available components	☐	☐	**0** or **10**
	Error tolerance: two errors or omissions			
5	**FILING AND PRINTING OF DRAWINGS**			
	6. PROCEDURE FOR FILING A DRAWING			
	6.1 Appropriate use of commands for filing a drawing on a diskette, in the required formats:	YES	NO	
	- .DWG (DraWinG)	☐	☐	
	- .DWF (Drawing Web Format)	☐	☐	**0** or **10**
	7. SETTING OF PARAMETERS FOR PRINTING A DRAWING			
	7.1 Observance of correct printing procedure			**0** or **5**
	Error tolerance: two printouts			
			Total:	**/ 100**

Minimum performance standard: 75 points

Comments: _____

_____

_____

_____

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Produce assembly drawings

5725 – Producing Assembly Drawings (Module 10; 872 395)						Duration: 75 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
1. Interpret detail drawings.	5	Interpretation of detail drawings of a mechanism	-	Exact description of the function of each component shown in the drawing	-	
				Accurate recognition of component assemblies	-	
				Accurate description of the function of the mechanisms that make up the system	-	
				Appropriate interpretation of English technical terms used in the drawing	-	
2. Organize the work.	10	Selection of appropriate reference documents	-	Selection of appropriate reference documents	-	
		1. Observance of assembly drawing standards and conventions	15	1.1 Appropriate orientation of the drawing of the mechanical system on the page	5	PT
				1.2 Appropriate determination of views required to represent the mechanism	10	PT
				Appropriate arrangement of views in sketch form	-	
		Preparation of workstation	-	Functional and ergonomic organization of workstation	-	
3. Draw the components to be manufactured.	25	2. Drawing of components to be manufactured	15	Correct dimensions and scale	-	
				2.1 Exact fit of components	15	PT
				Appropriate use of specialized CAD software commands	-	

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

5725 – Producing Assembly Drawings (Module 10; 872 395)					Duration: 75 hours	
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
4. Insert commercially available components.	25	3. Drawing of commercially available components	15	Effective search in a range of documents, catalogues and electronic media	-	
				Optimum use of specialized CAD software import commands	-	
				Correct dimensions and scale	-	
				3.1 Exact fit of components	15	PT
5. Insert dimensions and additional information.	25	4. Dimensions and additional information	30	Precise calculation of shape and positioning tolerances	-	
				Appropriate selection of positioning of adjusting components	-	
				Observance of dimensioning standards	-	
				4.1 Accurate and exhaustive list of components	15	PT
				Observance of order of manufacture in parts list	-	
				4.2 Accurate entry of assembly information	5	PT
				Correct use of symbols and notation	-	
				4.3 Correct completion of title block	5	PT
				4.4 Consistent language	5	PT
6. Check the drawing.	5	5. Checking and correcting of drawing	10	Observance of procedure for checking and approving a drawing	-	
				5.1 Conformity of drawing with initial data	10	PT
7. File and print documents.	5	6. Procedure for filing a drawing	10	6.1 Appropriate use of commands for filing a drawing in various formats	10	PT
		7. Setting of parameters for printing a drawing	5	7.1 Observance of correct printing procedure	5	PT

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

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INDUSTRIAL DRAFTING

5725

Using the Specialized Functions of a Computer-Aided Drafting Program

Module 11

872 407

PRACTICAL EXAMINATION

INDUSTRIAL DRAFTING
5725
USING THE SPECIALIZED FUNCTIONS OF A
COMPUTER-AIDED DRAFTING PROGRAM
(Module 11)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to use the specialized functions of a computer-aided drafting program.

The suggested duration of the examination is six hours.

2 Examination Procedure

2.1 Each candidate should be provided with:

- instructions on the work to be done
- a drawing in .DWG format including an object drawn in isometric projection, a block "BLOCK", as well as a Polyline (for Step 1)
- a drawing in .DWG format including a frame and a title block duly completed in a scale other than 1"= 1" or 1 : 1, an object drawn in orthographic projections, as well as an enlarged section (for Step 2)
- a drawing in .DWG format including a simple block allowing for the insertion of three attributes, a block containing two attributes to be altered (the value for one and the text height for the other), as well as a block containing attributes (for Step 3)
- a drawing representing an external reference file (for Step 3)
- a template file for extracting attributes in SDF format (for Step 3)
- a drawing in .DWG format including the drawing of a simple mechanism with at least one sectional view (for Step 4)
- a drawing in .DWG format of an object in orthographic projections (for Step 5)
- a drawing in .DWG format of a sloping object drawn in 3D (for Step 6)

2.2 Steps in the examination procedure:

Step 1:
- Determine the parameters for the LTSCALE and VIEWRES variables.
- Draw three ellipses, given the required dimensions, on an object drawn in isometric projection (one ellipse on each of the three views).
- Change the insertion point of a block, as required.
- Insert a segment in a Polyline using the PEDIT command, as required.

Step 2:
- Determine the appropriate dimension parameters for the DIMTXT, DIMASZ, DIMSCALE and DIMLFAC variables, and carry out the dimensioning, as required.

Step 3:
- Save a block in a separate file (WBLOCK).
- Insert a drawing in reference file form (XREF).
- Add three attributes to a block as required.
- Alter two attributes to a block, as required.
- Export the attributes of a block into an SDF format file using the template file provided.

Step 4:
- Enter hatching lines in an assembly drawing, in compliance with drawing conventions and the standards for indicating materials.

Step 5:
- Create the required lettering style and complete the dimensioning on the drawing in orthographic projections, by introducing Unicode symbols, as well as the appropriate specialized formatting codes, using the MTEXT command.

Example of dimension to be inserted:

$$\text{DRILL} \quad \text{Ø}\frac{5}{16} \times 1\frac{1}{4} \quad \text{D}$$

$$\frac{3}{8}-16\ \text{UNC} \times 1\ \text{D}$$

Step 6:
- Define and save the UCS (*User Coordinate Systems*) of the sloping plane of an object drawn in 3D.
- Draw a circle on the sloping plane, as required.
- Divide the window into four equal parts, using the VPORTS command.
- Represent the 3D object in the following views: top, front, right side and isometric.

EVALUATION FORM

INDUSTRIAL DRAFTING Program code: **5725**

11 – Using the Specialized Functions of a Computer-Aided Drafting Program Module code: **872 407**

Name of candidate: _____

School/centre: _____ Permanent code: _____

Date of examination: _____ RESULT: PASS ☐ FAIL ☐

Signature of examiner: _____

STEP	OBSERVATION			RESULT
1	**CONTROL OF ON-SCREEN DISPLAYS**			
	1. SETTING OF PARAMETERS FOR SYSTEM VARIABLES			
	1.1 Setting of correct parameters for:	YES	NO	
	- LTSCALE variable	☐	☐	
	- VIEWRES variable	☐	☐	**0** or **5**
	2. USE OF ADVANCED PROGRAM COMMANDS			
	2.1 Appropriate use of advanced program commands:	YES	NO	
	- creation of true ellipses on an object drawn in isometric view (one ellipse on each of the three views)	☐	☐	
	- alteration of the insertion point of a block, as required	☐	☐	
	- addition of a segment to a PolyLINE, using the PEDIT command, as required	☐	☐	**0** or **15**
2	**ALTERATION OF STYLES AND DIMENSION VARIABLES**			
	3. SETTING OF PARAMETERS FOR DIMENSION VARIABLES			
	3.1 Setting of appropriate dimension parameters, including:	YES	NO	
	- text height (DIMTXT)	☐	☐	
	- arrow dimensions (DIMASZ)	☐	☐	
	- global scale factor (DIMSCALE)	☐	☐	
	- scale factor for linear dimensions on an enlarged view (DIMLFAC)	☐	☐	**0** or **10**

STEP	OBSERVATION			RESULT
3	**USE OF A BLOCK LIBRARY**			
	4. ORGANIZATION OF AND ALTERATIONS TO A BLOCK LIBRARY			
	4.1 Observance of correct procedure for saving a block as a separate file (WBLOCK)			**0** or **5**
	4.2 Insertion of a drawing as a reference file (XREF)			**0** or **5**
	4.3 Optimum use of commands concerning the attributes of a block, including:	YES	NO	
	- addition of three attributes of a block, as required	☐	☐	
	Error tolerance: a total of two errors or omissions regarding the definition, text style or positioning of each attribute			
	- alteration of two attributes within the same block: the value for the first attribute and the text height for the second, as required	☐	☐	
	- appropriate exporting of the attributes of a block in a SDF format file, as required	☐	☐	**0** or **10**
4	**ENTERING OF HATCHING LINES ON A SECTIONAL DRAWING SHOWING SEVERAL MATERIALS**			
	5. ENTERING OF HATCHING LINES ON A DRAWING			
	5.1 Observance of drawing conventions and standards for indicating materials, using:	YES	NO	
	- correct scale	☐	☐	
	- correct angle	☐	☐	
	- appropriate hatching pattern	☐	☐	**0** or **10**
5	**INSERTION OF TABLES AND TEXT IN A DRAWING**			
	6. USE OF TEXT COMMANDS			
	6.1 Optimum use of commands to:	YES	NO	
	- create lettering styles	☐	☐	
	- enter Unicode symbols and special formatting codes	☐	☐	**0** or **15**

STEP	OBSERVATION			RESULT
6	**CONSTRUCTION OF 3D SHAPES USING WIRE-FRAME AND SURFACE MODELLING**			
	7. USE OF BASIC COMMANDS FOR DRAWINGS IN 3D			
	7.1 Appropriate selection of coordinates for shape construction of components, using the UCS (*User Coordinate Systems*):	YES	NO	
	- observance of appropriate procedure for defining and saving the UCS, given a sloping plane	☐	☐	
	- observance of appropriate procedure for drawing a circle on a sloping plane	☐	☐	**0** or **10**
	7.2 Appropriate selection of commands to view results:	YES	NO	
	- division of window into four equal parts, using the VPORTS command	☐	☐	
	- representation of an object in 3D in the following views: top, front, right side and isometric	☐	☐	**0** or **15**
		Total:		**/ 100**

Minimum performance standard: 80 points

Comments:

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Use the specialized functions of a computer-aided drafting program

5725 – Using the Specialized Functions of a Computer-Aided Drafting Program (Module 11; 872 407)						
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
1. Customize the graphical environment of the drafting program.	10	Customization of the drafting program	-	Appropriate adaptation of menus, toolbars and keyboard shortcuts	-	
				Use of appropriate functions	-	
2. Control on-screen displays.	15	1. Setting of parameters for system variables	5	1.1 Setting of correct parameters	5	PT
				Justification of parameters selected	-	
		2. Use of advanced program commands	15	2.1 Appropriate use of advanced program commands	15	PT
3. Change styles and dimension variables.	20	3. Setting of parameters for dimension variables	10	3.1 Setting of appropriate dimension parameters	10	PT
				Conformity of dimension styles with standards for technical drawing	-	
		Application of dimension style	-	Appropriate application of dimension techniques for various variables	-	
4. Use a block library.	15	4. Organization of and alterations to a block library	20	Structured organization of existing drawings into a library	-	
				Appropriate alterations to existing block	-	
				4.1 Observance of correct procedure for saving a block as a separate file	5	PT
				4.2 Insertion of a drawing as a reference file	5	PT
				4.3 Optimum use of commands to create, alter and export attributes of existing blocks	10	PT

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

5725 – Using the Specialized Functions of a Computer-Aided Drafting Program (Module 11; 872 407)							Duration: 105 hours
Specifications of the Expected Behaviour		**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
5.	Enter hatching lines on a sectional drawing showing several different materials.	5	5. Entering of hatching lines on a drawing	10	Optimum use of commands	-	
					5.1 Observance of drawing conventions and standards for indicating materials	10	PT
6.	Insert tables and text in a drawing.	10	Use of external tables	-	Observance of correct procedure for inserting tables created in other programs, such as word processing and spreadsheet programs	-	
			6. Use of text commands	15	6.1 Optimum use of commands to enter text, create paragraphs, create lettering styles, alter text, enter symbols	15	PT
7.	Manage drafting program files.	5	Location of files	-	Correct file extensions	-	
			Altering of files	-	Observance of correct procedure for locking files, transferring files from one program to another and from one user to another	-	
8.	Construct 3D shapes using wire-frame and surface modelling.	20	7. Use of basic commands for drawings in 3D	25	Accurate differentiation among various 3D drawing modes	-	
					7.1 Appropriate selection of coordinates for shape construction, using the *User Coordinate Systems* (UCS) command	10	PT
					Optimum use of commands to create basic surfaces	-	
					7.2 Appropriate selection of commands to view results	15	PT

W_I: relative weighting of indicators; W_C: relative weighting of criteria; STR: evaluation strategies (T: theory, PT: product, PS: process)
2000-10-03

Québec
Ministère
de l'Éducation

INDUSTRIAL DRAFTING

5725

Taking and Interpreting Measurements

Module 12

872 054

PRACTICAL EXAMINATION

INDUSTRIAL DRAFTING
5725
TAKING AND INTERPRETING MEASUREMENTS
(Module 12)

INFORMATION ON THE EVALUATION

1 Information and Instructions

This examination consists in evaluating the candidates' ability to take and interpret measurements. Candidates are permitted to use calculators, class notes or other relevant documents.

The suggested duration of the examination is three hours.

2 Examination Procedure

2.1 Each candidate should be provided with:
- instructions on the work to be done
- manufactured part(s)
- detail or assembly drawing(s), where necessary
- a requisition form for the materials required

2.2 Candidates must sketch and measure one or several manufactured parts. The number of parts depends on their complexity.

The readings to be taken must include ALL the annotations, measurements and details needed to produce the drawings.
No additional readings should be required.

2.3 Steps in the examination procedure:

Step 1: Analyze the manufactured part(s) and determine which measuring instruments and devices are required to do the work.

Step 2: Sketch the part(s):
- draw the sketch
- record the dimensional and geometric measurements, as well as additional information
- enter the information recorded

EVALUATION FORM

INDUSTRIAL DRAFTING Program code: **5725**

12 – Taking and Interpreting Measurements Module code: **872 054**

Name of candidate: _____

School/centre: _____ Permanent code: _____

Date of examination: _____ RESULT: PASS ☐ FAIL ☐

Signature of examiner: _____

STEP	OBSERVATION			RESULT
1	**PLANNING OF WORK**			
	1. SELECTION OF MATERIAL			
	1.1 Selection of the appropriate measuring instruments and devices according to the work to be done			**0** or **10**
	Error tolerance: one omission only			
2	**SKETCHING OF PART**			
	3. REPRESENTATION OF PART			
	3.1 Proper choice of views			**0** or **10**
	Error tolerance: one irrelevant or redundant view			
	3.2 Accurate representation of part	YES	NO	
	- conformity of sketch with part	☐	☐	
	Error tolerance: one omission only			
	- proper observance of proportions of part	☐	☐	**0** or **10**
	2. ACCURATE READNG OF MEASUREMENTS			
	2.1 Accurate reading of dimensional and geometric measurements:	YES	NO	
	- accuracy of dimensional measurements to ±1mm (±0.04"), with regard to nominal dimensions	☐	☐	
	Error tolerance: two incorrect readings or omissions			
	- accuracy of geometric measurements to ±0.5mm (±0.02")	☐	☐	**0** or **25**
	Error tolerance: two incorrect readings or omissions			
	2.2 Accurate interpretation of measurements (appropriate number of decimals)			**0** or **15**
	Error tolerance: one error only			

STEP	OBSERVATION			RESULT
	4. TRANSFER OF INFORMATION			
	4.1 Accurate recording of dimensioning and relevant information:	YES	NO	
	- dimensioning lines in conformity with drawing conventions	☐	☐	
	Error tolerance: two errors			
	- accurate and complete list of all necessary annotations	☐	☐	**0** or **15**
	Error tolerance: two errors or omissions			
	5. QUALITY OF PRESENTATION			
	5.1 Clean, neat presentation			**0** or **5**
	5.2 Legible presentation			**0** or **10**
			Total:	**/ 100**

Minimum performance standard: 80 points

Comments:

PROGRAM ANALYSIS AND TABLE OF SPECIFICATIONS – BEHAVIOURAL OBJECTIVE

PROGRAM: Industrial Drafting
EXPECTED BEHAVIOUR: Take and interpret measurements

5725 – Taking and Interpreting Measurements (Module 12; 872 054)						Duration: 60 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
1. Plan the work.	10	Analysis of the object	-	Understanding of the context and characteristics of the object to be measured	-	
				Accurate interpretation of the information contained in the drawings and specifications: dimensions, tolerances, instructions	-	
		1. Selection of material	10	1.1 Selection of the appropriate measuring instruments and devices according to the work to be done	10	PS
				Proper positioning of part and choice of fastenings for the part to be measured	-	
				Organized arrangement of instruments and devices	-	
2. Prepare the measuring instruments, as well as the part to be measured.	10	Preparation of material	-	Precise inspection of instruments and devices	-	
				Accurate calibration and adjustment of measuring instruments and devices	-	
				Proper preparation of part	-	
				Cleanliness of work area		
3. Measure parts of different shapes.	45	2. Accurate reading of measurements	40	Accurate calculation of information needed for measurement	-	
				Proper use of measuring instruments and devices	-	
				2.1 Accurate reading of dimensional and geometric measurements	25	PT
				Accurate conversion of dimensions in the metric and imperial systems of measurement	-	

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2000-10-03

5725 – Taking and Interpreting Measurements (Module 12; 872 054)						Duration: 60 hours
Specifications of the Expected Behaviour	**Duration (%)**	**Performance Indicators**	**W_I**	**Criteria**	**W_C**	**STR**
				2.2 Accurate interpretation of measurements (appropriate number of decimals)	15	PT
				Accurate recording of results	-	
4. Interpret the physical characteristics of parts.	5	Use of instruments and devices	-	Proper use of measuring instruments and devices	-	
				Accurate readings	-	
				Observance of technique for converting scales	-	
				Accurate recording of results	-	
5. Sketch the part.	25	3. Representation of part	20	3.1 Proper choice of views	10	PT
				3.2 Accurate representation of part	10	PT
		4. Transfer of information	10	4.1 Accurate recording of dimensioning and relevant information	10	PT
		5. Quality of presentation	20	5.1 Clean, neat presentation	10	PT
				5.2 Legible presentation	10	PT
6. Perform regular maintenance on measuring instruments and devices.	5	Maintenance of material	-	Careful cleaning of instruments and devices	-	
				Lubrication of instruments and devices at the appropriate points	-	
				Proper storage of instruments and devices	-	

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