

GNG4170 – Engineering and the Law

Final Examination - April 22, 2003 – 3 hrs, closed book

Spend 10 minutes simply reviewing the entire examination, and, among other things, deciding which questions you will answer (when given a choice).

Part A [25 marks, approx. 45 minutes]

You must answer both parts of question one.

- Q1** (a) why does the PEO grant a temporary license? [2 marks]
(b) what is a certificate of authorization, and give a clear example where one would be needed [3 marks]

You must answer two (2) of the following three (3) questions. Only answer two (2). Attached to this exam, to assist you, is a copy of sections 72 (definition of professional misconduct) and 77 (code of ethics) of the regulation under the *Professional Engineers Act*. [10 marks each X 2 = 20 marks, approx. 17 minutes each, 35 minutes (total)]

- Q2** Delta, P.Eng., works full-time for ABC Co., and a part of Delta's job is selecting and specifying computer-controlled automation systems. Delta is considering doing some extra engineering work in the evenings for other, private clients, including some of the manufacturers who produce the automation-systems which Delta reviews on a day-to-day basis (Delta has some ideas on design modifications). Discuss what ethical and practical considerations arise in this situation, and what Delta should do.
- Q3** Epsilon, an engineer, is attending a two-day conference on the construction of large-scale water dams. Over drinks on the first evening, Epsilon is talking with Theta (another engineer, who works for a competitor of Epsilon's firm). Theta is discussing a project that Theta's company is finalizing, and it becomes clear to Epsilon that a particular structural test has not been performed by Theta's company. Even on this basic information, Epsilon is convinced that if the project is completed as planned by Theta's company, the dam might collapse, causing massive flooding. Discuss what ethical and practical considerations arise in this situation, and what Epsilon should do.
- Q4** Mu has recently been promoted at ABC Software Engineering, and is working hard to complete the design for new software, but does not believe the deadline can be met. Mu's spouse, Psi (who works for a competitor, DEF Software Engineering) offers to give Mu an earlier version of the code for DEF's software, which Mu could use to complete the work for ABC. Discuss what ethical and practical issues arise in this situation, and what Mu should do.

Part B [65 marks, approx. 2 hours]

Q5 Briefly discuss five (5) of the following seven (7) terms/principles. Only discuss five (5) of the terms. Your goal should be trying to note five separate, relevant points about each. [5 marks each X 5 = 25 marks, approx. 9 minutes each, or 45 minutes (total)]

- (a) Elements of an enforceable contract [list only];
- (b) Statutory holdback;
- (c) Contract 'A';
- (d) Identify 3 types of intellectual property, and the length of protection for 2 of them;
- (e) Innocent misrepresentation;
- (f) "piercing the corporate veil"; and
- (g) specific performance.

You must answer two (2) of the three (3) following questions. Only answer two (2).
[20 marks each X 2 = 40 marks, approx. 35 minutes each, or 1 hour, 10 minutes (total)]

Q6 If you choose this question, you must answer each part. [10 marks each X 2 = 20 marks, approx. 17 minutes each, or 35 minutes (total)]

(a) Three years ago, Rho, an engineer, prepared plans and specifications for a structural addition to a local restaurant. The restaurant was sold to a new owner a year ago, and the new owner has finally discovered cracks in the supporting walls (which became visible six months ago). Discuss the issue of limitation periods, namely what they are and how they apply to these facts. Would your answer change if Rho was not an engineer, but simply a general contractor? Would your answer change if the restaurant had never been sold and it was the original owner who had discovered the structural problems?

(b) Lamda works for XYZ Engineering, a mechanical engineering firm, and has a significant amount of contact with the firm's clients. When hired, Lamda signed an employment contract which noted (among other matters): "Lamda agrees that if Lamda's employment ends with XYZ Engineering, that for a period of 8 months, Lamda will not work as a mechanical engineer, within a 25 kilometre radius of XYZ's office." Lamda is thinking about leaving XYZ Engineering, and is concerned about this specific term. What advice/information can you provide to Lamda?

Q7

Omicron Inc. (an engineering company) was hired by Acme Chemicals Inc. (both Canadian companies) to design an exterior transport system for a highly explosive chemical (from storage tanks, to the manufacturing plant itself). The contract price was \$3 million dollars. Four months after completion, the transport system broke-down. The chemical leaked, resulting in a huge explosion. Fortunately no one was injured, but Acme had to pay \$2 million dollars to repair the damages, \$1 million in fines from the Ministry of the Environment, and an additional \$2 million to have the system re-designed and re-installed (the new system operated to proper specifications). Acme also lost \$1 million in profit as a result of its operations being shut down for one month. Two independent reports have confirmed that the original system (designed by Omicron) could never have met the proper specifications as a result of Omicron's significantly deficient design.

Omicron's and Acme's contract contained the following provision: "Omicron accepts no responsibility, of any kind, for whatever injury or damage, however caused, whether by breach of a contractual obligation or any negligence, beyond the amount of \$4 million dollars. Omicron's total liability is limited to \$4 million dollars). To date, Omicron has been paid \$2,500,000 of the \$3 million dollar contract price.

What damages would Acme claim against Omicron? What damages would Acme ultimately be entitled to? Discuss, making sure to note the legal history of how the Courts have approached contractual terms that appear to limit liability.

Q8

Rho, P.Eng. works for Quest Engineering, and was assigned the task of preparing designs and specifications ("d&s") for Pi Industries (a major client). Rho had been working very hard on many separate projects, and had to spend overtime, late at night, completing the d&s for Pi. Rho completed the d&s on time.

Pi took those d&s and prepared a tender package, and accepted bids from general contractors to complete the work. Obviously, the d&s were a key part of that tender package for the general contractors to consider when submitting their bids. Ultimately, GC Ltd. was chosen, and hired as the general contractor to complete the work for Pi. The fixed price contract, between Pi and GC, for GC to complete the work, was \$2 million dollars.

After one month of work, GC discovered mistakes and inconsistencies in the d&s (Rho had used outdated design tables for some calculations) – these mistakes would not have been obvious to the tenderers from a casual review of the d&s, but could only be truly understood after the work had actually started.

Ultimately, GC had to pay an additional \$100,000 in salaries, and \$200,000 in increased materials cost (to 'cure' the problems). Under their contract, GC could not pass these expenses onto Pi.

What liabilities in **tort** law arise in this case? Provide a discussion of the Court case, the issues considered, and the likely result.

FBC

Exemption Clause

The tunnel was built, collapsed before opening day, and an independent report confirmed that the problem could have been avoided had the information in the geological reports been taken into consideration in preparing the plans and specifications for the tunnel.

What liabilities in *tort* law arise in this case? In your answer (which will lead to a position on the likely outcome in this case) make sure you discuss the relevant legal principles.

Q11 Lamda Engineering Ltd. has a contract with Mega Co. to prepare an environmental assessment on one of Mega's properties (property "X"). The contract states that if Lamda finishes the work by December 31st, Lamda is entitled to exercise an option to do the same kind of assessment on another of Mega's properties (property "Y"), for the same cost (\$50,000).

In late November/early December of that year, several of Lamda's full-time employees become sick, and the Vice-President of Lamda approaches Mega about the problem. Lamda does not want to hire independent contractors to complete the work by the deadline, as this could be expensive.

The President of Mega indicated to Lamda's VP that Mega understood Lamda's difficulties, and, feeling very kind (since it was near the holidays, after all), confirmed verbally that "everything would be fine—just the same—as long as you [Lamda] finish the work on property X by January 15th of the New Year". Lamda was very pleased, since Mega was not required to "give them a break" under the terms of the contract.

Of course, Lamda simply waited until its full-time employees were feeling better to complete the work, instead of hiring the independent contractors. Lamda finished the work on property X by January 10th.

On January 12th, Lamda then sent a letter to Mega indicating Lamda would exercise its option under the contract to prepare the environmental assessment on property Y. Mega refused, indicating that Lamda was not entitled to exercise the option since it had not met the December 31st deadline (for completing the work on property X) noted in the written contract.

Was Mega entitled to deny Lamda's exercise of the option (to do work on property Y)? Discuss, ensuring you identify and explain the relevant legal principles that apply to these facts.

[end of exam]

[best wishes for both the summer and the future]

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