

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.

Tau, P.Eng., employed by a large well-known automobile parts testing laboratory, represents the firm on an international standards advisory committee. Eight members of the ten-person committee are licensed professional engineers. After an extensive discussion on a standard at a recent meeting, the committee voted in favour. Although Tau was the only dissenting vote, the committee considered Tau's reasons for objecting; and, after further discussions, it agreed that they were unsubstantiated and passed a motion to accept and publish the standard.

Subsequently, the laboratory where Tau is employed received a contract to test automobile parts to this standard and Tau was assigned the job of supervising the tests, preparing the final report indicating that the parts meet the standard, and signing it on behalf of the firm. However, Tau is still vehemently opposed to the standard and therefore refuses the assignment. Tau argues that signing a report attesting to the conformance of the parts to the standard would suggest endorsement of it.

Is Tau's argument for refusing to undertake the assignment correct? What action might Tau have taken?