

# **Professional Practice Examination**

**Reprint – April 2017**

# ASSOCIATION OF PROFESSIONAL ENGINEERS OF ONTARIO

## PROFESSIONAL PRACTICE EXAMINATION – April 8,2017

### PART “A” – Professional Practice and Ethics

You will be given a total of **90 minutes** to complete this examination.

Use the correct colour-coded Answer Book for each part, place in the correct envelope and **seal after completed**.

*White Answer Book for Part A white question paper.*

*Coloured Answer Book for Part B coloured question paper.*

This is a “**CLOSED BOOK**” examination. No aids are permitted other than the excerpts from the 1990 Ontario Regulation 941 covering sections 72 (*Professional Misconduct*) and 77 (*Code of Ethics*) supplied at the examination. Dictionaries are **not** permitted.

The marking of questions will be based not only on academic content, but also on legibility and the ability to express yourself clearly and correctly in the English language. If you have any doubt about the meaning of a question, please state clearly how you have interpreted the question.

All **four** questions constitute a complete paper for Part “A”. Each of the four questions is worth 25 marks.

**WHERE A QUESTION ASKS IF A CERTAIN ACTION BY AN ENGINEER WAS ETHICAL OR NOT, A SIMPLE “YES” OR “NO” ANSWER IS NOT SUFFICIENT. YOU ARE EXPECTED TO COMMENT ON AND DISCUSS THE ACTION OF THE DIFFERENT INDIVIDUALS AND/OR ORGANIZATIONS INVOLVED IN EACH SITUATION.**

You should identify where applicable the appropriate clauses in Regulation 941. **SIMPLE REFERENCE TO THE APPROPRIATE CLAUSES WITHOUT A DISCUSSION OF HOW THE CLAUSE APPLIES IN THE SITUATION DESCRIBED IS NOT SUFFICIENT.**

### Question 1

- (5) (a) Several years ago the P. Eng. licence for an individual lapsed for failure to pay his dues/fees. That individual recently called himself a P.Eng. in Provincial election material. What could PEO do, if anything, about this? Explain.
- (5) (b) Can Temporary licence holders call themselves professional engineers? Explain.
- (5) (c) What is the purpose of the engineer's seal? What two elements are required to accompany the seal?
- (5) (d) You are a P.Eng. who volunteers for a community group. You are asked to conduct an engineering review of a new building design at no cost to the organization and with the knowledge of the design engineer. Do you need a Certificate of Authorization to do this work? Explain.
- (5) (e) What are the consequences, if any, to a professional engineer who does not keep his or her licence permanently displayed in his or her place of business?

### Question 2

Grey, P.Eng, has been in the employ of Enterprise Engineering Inc (Enterprise) since his graduation from engineering school six (6) years ago. Since obtaining his P.Eng licence, two (2) years ago, he has been discussing with his supervisor, Holdup, P.Eng the possibility of being assigned more challenging projects. Holdup agreed to provide Grey with the challenge he is seeking, however the opportunity does not appear to be forthcoming and Grey has become frustrated. Grey reviews and evaluates bids submitted by suppliers for Enterprise.

Grey 's engineering potential is well recognized both inside and outside Enterprise. Consequently, while Grey is still waiting to receive the promised challenging assignments at Enterprise, he learns of an opportunity to do some work in the evenings and on weekends for SupplyCo, a regular supplier to Enterprise. Grey agrees to work part-time for SupplyCo as an independent contractor.

A few months after starting the part-time job, Grey is asked by his primary employer, Enterprise, to review a bid from SupplyCo. He had helped SupplyCo prepare that particular bid.

Using the Code of Ethics and Professional Misconduct as your guide:

- (10) (a) Discuss the appropriateness of Grey`s employment arrangements.
- (10) (b) How should Grey respond to Enterprise`s request to review the bid from Supply?
- (5) (c) Would Grey need a Certificate of Authorization to provide services to SupplyCo? Explain.

### Question 3

Quick Start Transportation (Quick Start) is a design-build firm and has been hired by a municipality in Ontario to engineer, procure and construct an automated light rail transit system (the “LRT”).

You are employed as a professional engineer by Quick Start and are on the team that is designing the LRT. The LRT’s design includes a new, sophisticated computer control system for the operation of its trains. You are not involved in the design of the computer control system.

One night after work, you get together for dinner with a female P.Eng. colleague you met while at university. Your colleague also works at Quick Start as a software engineer but is not working on the LRT design. During the dinner, your colleague commented that Quick Start was rushing ahead too fast with the LRT project under the pressure of a tight completion schedule. She also stated that she believes Quick Start is not conducting sufficient testing on the computer control system and she is concerned that flaws may go undetected until the LRT goes into operation.

The next day, together with your colleague, you approach your direct supervisor, Overt, P.Eng., to discuss these concerns. Your supervisor comments to your friend that although she is competent there are times to be a man and take some chances. Overt adds that with too much testing the project could be delayed unnecessarily causing it to be cancelled. He reasons that its cancellation would not only result in the loss of many jobs, it would also deprive the public of the benefits of a much needed transit system. Overt also comments that all technological advancement entails some degree of uncertainty and risk and that insistence upon absolute safety would impede engineering progress. He dismisses your female colleague’s concerns with a derogatory joke about women.

Using the Codes of Ethics and Professional Misconduct as your guide:

- (15) (a) In view of the above stated facts, what do you see as your ethical obligations as a professional engineer as it relates to your employer and the public?
- (10) (b) Discuss on Overt’s conduct.

#### Question 4

You are a professional engineer employed by FirstChoice Ltd., a consulting engineering company with a valid Certificate of Authorization.

One of the firm's clients, Big Box Developments Ltd. ("Big Box"), has hired your firm to provide the engineering design for a new elevated walkway for one of Big Box's major shopping malls. You have been assigned the responsibility of preparing the design for Big Box.

You develop the design and meet with Bravo, a representative of Big Box, to discuss your design. Bravo is not a professional engineer, but disagrees with your design. He gives you some suggestions on how to simplify your design. You listen politely, but believe that the design might be compromised if the suggestions were incorporated. You cannot identify any specific safety concerns with the suggested changes but refuse to make them.

Because of the disagreement, Bravo fires FirstChoice and hires SecondChoice Ltd., another engineering firm. Bravo demands that you turn the design drawings over to Ternate, a professional engineer employed by SecondChoice Ltd.

Bravo had worked with Ternate on a previous project, and the two of them got along quite well. Ternate has agreed to complete the design of the new elevated walkway incorporating the changes Bravo has requested.

You refuse to turn over the design drawings, even when Bravo offers to pay for all of FirstChoice's services to date.

Using the Codes of Ethics and Professional Misconduct as your guide:

- (10) (a) Do you have any obligation to turn over the drawings? If so how?
- (5) (b) Do you have any other responsibilities? Discuss.
- (10) (c) Comment on Ternate's conduct and agreement with Bravo.

# ASSOCIATION OF PROFESSIONAL ENGINEERS OF ONTARIO

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### PART “B” - Engineering Law and Professional Liability

This examination comes in two parts (**Part “A” and Part “B”**). Both parts must be completed in this sitting. You will be given a total of **180 minutes** to complete the examination.

Use the correct colour-coded Answer Book for each part, place in the correct envelope and **seal after completed**.

*White Answer Book for Part A white question paper.*

*Coloured Answer Book for Part B coloured question paper.*

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All **four** questions constitute a complete paper for Part “B”. Each of the four questions is worth 25 marks.

- (25) 1. Briefly define and explain any five of the following:
- (i) The difference between mediation and arbitration
  - (ii) Statutory holdback
  - (iii) The discoverability concept
  - (iv) Common law
  - (v) Contra proferentem
  - (vi) Secret commission
  - (vii) The essential elements of an enforceable contract (list only)
  - (viii) Five examples of equal treatment employment rights to which individuals are entitled under the Ontario Human Rights Code (list only).

- (25) 2. An information technology firm submitted a bid to design and install software and hardware for an electronic technology process to control the operation of large scale sorting equipment for a major international courier company.

The firm's fixed guaranteed maximum price was the lowest bid and the contract was awarded to it. The contract conditions entitled the information technology firm to terminate the contract if the courier company did not pay monthly progress payments within 15 days following certification that a progress payment was due. Pursuant to the contract, the certification was carried out by an independent engineering firm engaged as contract administrator.

The work under the contract was to be performed over a 5 month period. After commencing work on the project the information technology firm determined that it had made significant judgment errors in arriving at its bid price and that it would face a major loss on the project. Its concern about the anticipated loss was increased further when it also learned that, in comparison with the other bidders, its bid price was extremely low and that, in winning the bid, it had left more than one million dollars "on the table".

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Two monthly progress payments were certified as due by the independent engineering firm and paid by the courier company in accordance with the terms of the contract. However, after the third monthly progress payment was certified as due by the independent engineering firm, the courier company's finance department asked the information technology firm's representative on the project for additional information relating to an invoice from a subcontractor to the information technology firm. The subcontractor's invoice comprised a portion of the third progress payment amount. The courier company's finance department requested that the additional information be provided prior to payment of the third progress payment.

There was nothing in the signed contract between the information technology firm and the courier company that obligated the information technology firm to provide the additional information on the invoice from its subcontractor. However, the information technology firm's representative did verbally clearly indicate to the courier company's finance department that the additional information would be provided.

The additional information relating to the subcontractor's invoice was never provided by the information technology firm.

Sixteen days after the third progress payment had been certified for payment, the information technology firm notified the courier company in writing that it was terminating the contract because the courier company was in default of its obligations to make payments within fifteen days pursuant to the express wording of the contract.

Was the information technology firm entitled to terminate the contract in these circumstances? In giving reasons for your answer, identify and explain the relevant legal principle and how it would apply.

- (25)           3.     Clearwater Limited, a process-design and manufacturing company, entered into an equipment-supply contract with Pulverized Pulp Limited. Clearwater agreed to design, supply, and install a cleaning system at Pulverized Pulp's Ontario mill for a contract price of \$800,000. The specifications for the cleaning system stated that the equipment was to remove ninety-eight percent of certain prescribed chemicals from the mill's liquid effluent in order to comply with the requirements of the environmental control authorities. However, the contract clearly provided that Clearwater accepted no responsibility whatsoever for any indirect or consequential damages, arising as a result of its performance of the contract. The cleaning system installed by Clearwater did not meet the specifications, but this was not determined until after Clearwater had been paid \$980,000 by Pulverized Pulp. In fact, only thirty percent of the prescribed



chemicals were removed from the effluent.

As a result, Pulverized Pulp Limited was fined \$100,000 and was shut down by the environmental control authorities. Clearwater made several attempts to remedy the situation by altering the process and cleaning equipment, but without success.

Pulverized Pulp eventually contracted with another equipment supplier. For an additional cost of \$1,300,000, the second supplier successfully redesigned and installed remedial process equipment that cleaned the effluent to the satisfaction of the environmental authorities, in accordance with the original contract specifications between Clearwater and Pulverized Pulp.

Explain and discuss what claim Pulverized Pulp Limited can make against Clearwater Limited in the circumstances. In answering, explain the approach taken by Canadian courts with respect to contracts that limit liability and include a brief summary of the development of relevant case precedents.

(25)

4. The owner of a grocery store chain in Ontario, contracted with an architect to design and prepare the construction documentation for a new store in a town in northern Ontario.

The architect produced some general construction specifications that included a requirement that an automatic sprinkler system, conforming to the National Fire Protection Association ("NFPA") standards, be installed.

The architect retained an engineering firm pursuant to a separate agreement to which the owner was not a party. Under the contract the engineering firm was to prepare the detailed engineering design for the project, including the sprinkler system. The engineering design was to conform to the architect's general specifications.

A recent engineering graduate employed by the engineering firm prepared the design of the sprinkler system. Not being familiar with the NFPA requirements, the employee read certain sections of the standards but did not have enough time, given other project responsibilities, to pay close attention to all the details. A

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professional engineer reviewed the employee's completed sprinkler system design. Although the professional engineer did not perform a detailed check, the professional engineer considered the design satisfactory. Six months after the store opened for business, a fire occurred early one morning. The fire caused substantial damage to the store and to its inventory and the Owner had to close the store for repair.

The owner retained a consulting engineer to conduct an independent investigation. The consulting engineer determined that the sprinkler system was inadequately designed. Specifically, the design did not conform to the NFPA standards, which required, among other things, that the coverage per sprinkler head was not to exceed 10 square metres. The consulting engineer determined that 10 percent of the sprinkler heads were designed to cover an area as high as 25 square metres. The report indicated that, in the consulting engineer's expert opinion, had the sprinkler head spacing conformed to the NFPA standards, the fire should have been quickly extinguished and would not have spread to any great extent.

What liabilities in *tort law* may arise in this case? In your answer, explain the purpose of tort law and identify what essential principles of tort law are relevant. Apply each principle to the facts. Indicate a likely outcome of the matter.