

Professional Practice Examination

Reprint – August 2016

ASSOCIATION OF PROFESSIONAL ENGINEERS OF ONTARIO

PROFESSIONAL PRACTICE EXAMINATION – August 6, 2016

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) A P.Eng. has been sending sexually insensitive jokes around the office by e-mail even though he has been asked to stop. What are the consequences, if any, under the Professional Engineers Act?
- (5) (b) Can limited licence holders call themselves professional engineers? Explain.
- (5) (c) Where a licence, certificate of authorization, temporary licence, provisional licence or limited licence is revoked or cancelled what should the holder do with the certificate and seal (stamp)?
- (5) (d) You are a P.Eng. who volunteers for a community group. You are asked to conduct an engineering review of a land use proposal and propose some changes to the proposal at no cost to the organization. Do you need a Certificate of Authorization to do this work? Explain.
- (5) (e) The members of PEO Council are both elected and appointed. Who elects the members and who appoints the members?

Question 2

You are a professional engineer. At the beginning of the year you became employed by a municipality in Ontario as head of the municipality's procurement department. Your new responsibilities include participating in the bid selection and contract granting process for various municipal construction projects. Your staff review the bids and submit them to you with a recommendation for your approval.

Before joining the municipality, you were a partner at a very successful consulting engineering firm. At the end of last year, you sold your interest in the consulting engineering firm to your partner.

Shortly after your appointment to your new position with the municipality, you learned that your former partner sold the consulting engineering firm to Corporation "X". Your partner is now an officer of Corporation X.

You have now been in your new job for 9 months. In your new capacity, you have been presented with documents recommending the award of a major engineering contract to Corporation "X". You have been asked to approve the award.

- (10) (a) Discuss the situation in which you find yourself.
- (10) (b) What steps should you take? Explain your reasoning.
- (5) (c) Will you suffer any consequences from PEO? Discuss.

Question 3

FarmFab is a designer and manufacturer of farming equipment.

Recently, Farmer was seriously injured while operating a tractor designed and manufactured by FarmFab. In a letter to FarmFab, Farmer's lawyer claimed that the injury was due to a malfunction caused by a design error made by FarmFab's engineering department. The letter threatened that FarmFab would be sued on account of Farmer's injuries.

You are a P.Eng. and the senior design engineer in FarmFab's Engineering Department. You were not involved in the original design of the tractor. At the request of your manager, a P.Eng. you investigate the design and you conclude that the tractor was not designed properly and that Farmer was injured when certain safety features of the tractor failed to function under some very unique circumstances. You also conclude that, although it is highly unlikely that other farmers would find themselves in the same situation, if they did they could also suffer similar injuries. You report your conclusions to your manager.

Your manager takes your report to a corporate management meeting about the problem. Based on your report senior management decides to settle the claim out of court. In exchange for the payment, Farmer agreed to give up the lawsuit and agreed to keep the payment a secret. The secrecy agreement was very important to FarmFab because FarmFab did not want future tractor sales to suffer from bad publicity.

Management authorizes you to change the design to prevent issues with future tractors but does not allow a recall of the existing tractors. They reason that the chance of an accident is very remote and that a recall would cost them an extraordinary amount of money that would badly impact their financial health. Your manager asks you to follow the management direction and to not discuss this with anyone else.

- (18) (a) Discuss this situation and identify the specific steps should you take, giving any consequences you might face.
- (7) (b) Discuss your manager's conduct and any consequences he might face.

Use the Codes of Ethics and Professional Misconduct as your guides

Question 4

Furtive P.Eng , with a Certificate of Authorization (C of A), was hired to review the construction of foundations for a new high-rise condominium building for compliance with the design. The design had been prepared by you, a licensed P.Eng. at Total Engineering Inc. who also hold a C of A. Furtive sent the city a signed certificate stating that the building foundation was built as designed. The certificate included design drawings with Furtive's seal and signature showing the original design performed by you. When the owner sent some pictures of the foundation to you, you noticed that an element of your design was missing.

You were concerned that other elements might not have been constructed as designed and performed some testing. The results showed that the foundation was not constructed as designed and in your opinion was unsafe. You notified both the owner and the city.

Faced with the conflicting opinion of two professional engineers the city requested that the owner obtain another opinion from an expert P.Eng. who verified that the foundation was not built as designed by you. Furtive, in response to the reports, submitted a revised design that he claimed was as effective as the original design. Furtive also submitted a letter to the owner and the city stating that the foundations would withstand any design loads.

You ordered additional testing and determined that the revised design suggested by Furtive had not been installed. Having concerns for the construction, you attempted to contact Furtive to discuss the situation. Furtive did not return your calls. You then obtained a copy of the certificate signed by Furtive from the city. You noted that the final certificate was signed two weeks before the foundation was completed.

Using the code of ethics and code of professional misconduct as your guide:

- (20) (a) Discuss the actions of Furtive P.Eng and any consequences he might face.
- (5) (b) Discuss your actions and consequences you might face.

ASSOCIATION OF PROFESSIONAL ENGINEERS OF ONTARIO

PROFESSIONAL PRACTICE EXAMINATION – August 6, 2016

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**.

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PROFESSIONAL PRACTICE EXAMINATION – August 6, 2016

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(25)

1. Briefly define and explain any five of the following:

- (i) The difference between arbitration and mediation
- (ii) The parol evidence rule
- (iii) The discoverability concept
- (iv) Five examples of equal employment rights to which individuals are entitled under Ontario's Human Rights Code
- (v) Contra proferentem
- (vi) Secret commission
- (vii) The New York Convention
- (viii) Contract A in tendering

(25)

2. Provincial Life of Ontario Inc. ("Provincial"), an insurance company, retained an architect to design a new corporate head office in North York, Ontario. Provincial, as client, and the architect entered into a written client/architect agreement in connection with the project. According to the agreement, the architect was to prepare the complete architectural and engineering design for the project.

In order to carry out the structural engineering aspects of the design, the architect engaged the services of a structural engineering firm. The architect and the structural engineering firm entered into a separate agreement to which Provincial was not a party.

To determine the nature of the soil on which the project would be constructed, two shallow test pits, each about 1.25 meters deep, were dug on the site at locations selected by the architect. The architect telephoned the structural engineering firm's vice-president and requested that the firm send out a professional engineer to examine the soils exposed in the test pits.

Based on information received from the professional engineer sent to examine the soil, the vice-president of the structural engineering firm reported to the architect that the test pits had revealed a silty clay. The vice-president also recommended to the architect that a soils engineer be engaged to carry out more thorough and proper soils tests. The architect rejected the recommendation stating that there was not "enough room in the budget" for more soils test.

The architect succeeded in persuading the vice-president to send a letter to Provincial giving a "soils report" based on the examination of the shallow test pits.

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The vice- president stated in a letter to Provincial, that based on its examination of the test pits, the soil was a fairly uniform mixture of clay and silt which would be able to

support loads up to a maximum of 100 kPa.

The structural engineering firm then completed its structural engineering design on the basis of the maximum soil load reported to Provincial.

The project was constructed in accordance with the plans and specifications. Subsequently, the building suffered extensive structural change, including severely cracked and uneven floors and walls.

On the basis of an independent engineering investigation by an engineer retained by Provincial, it was determined that the extensive structural change in the building had resulted from the substantial and uneven settlement of the building. The investigation also determined that the subsoil in the area of the building consisted of 30 to 40 meters of compressible marine clay covered by a surface layer of dryer and firmer clay two meters in depth. The investigation also revealed that the test pits that were dug had not penetrated the surface layer into the lower layer of compressible material.

What potential liabilities in tort law, arise from the preceding set of facts? Please state the essential principles applicable to a tort action and apply these principles to the facts above. Indicate a likely outcome of the matter.

(25)

3. A telecommunications development company leased an outdated and unused underground pipe system from an Ontario municipality. The developer's purpose in leasing the pipe was to utilize it as an existing conduit system in which to install a fibre optic cable system to be designed, constructed and operated in the municipality by the telecommunications developer during the term of the lease. All necessary approvals from regulatory authorities were obtained with respect to the proposed telecommunications network.

The telecommunications development company then entered into an installation contract with a contractor. For the contract price of \$4,000,000, the contractor undertook to complete the installation of the cable by a specified completion date. The contract specified that time was of the essence and that the contract was to be completed by the specified completion date, failing which the contractor would be responsible for liquidated damages in the amount of \$50,000 per day for each day that elapsed between the specified completion date and the subsequent actual completion date. The contract

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also contained a provision limiting the contractor's maximum liability for liquidated damages and for any other claim for damages under the contract to the maximum amount of \$1,000,000.

Due to its failure to properly staff and organize its workforce, the contractor

failed to meet the specified completion date. In addition, during the installation, the contractor's inexperienced workers damaged significant amounts of the fibre optic cable, with the result that the telecommunications development company, on subsequently discovering the damage, incurred substantial additional expense in engaging another contractor to replace the damaged cable. Ultimately, the cost of supplying and installing the replacement cable plus the amount of liquidated damages for which the original contractor was responsible because of its failure to meet the specified completion date, totalled \$1,800,000.

Explain and discuss what claim the telecommunications development company could make against the contractor in the circumstances. 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. A mining contractor signed an option contract with a land owner which provided that if the mining contractor (the "optionee") performed a specified minimum amount of exploration services on the property of the owner (the "optionor") within a nine month period, then the optionee would be entitled to exercise its option to acquire certain mining claims from the optionor.

Before the expiry of this nine month "option period", the optionee realized that it couldn't fulfil its obligation to expend the required minimum amount by the expiry date. The optionee notified the optionor of its problem prior to expiry of the option period and the optionor indicated that the option period would be extended. However, no written record of this extension was made, nor did the optionor receive anything from the optionee in return for the extension.

The optionee then proceeded to perform the services and to finally expend the specified minimum amount during the extension period. However, when the optionee attempted to exercise its option to acquire the mining claims the optionor took the position that, on the basis of the strict wording of the signed contract, the optionee had not met its contractual obligations. The optionor refused to grant the mining claims to the optionee.

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Was the optionor entitled to deny the optionee's exercise of the option? Identify the contract law principles that apply, and explain the basis of such principles and how they apply to the positions taken by the optionor and by the optionee.

