ASSOCIATION OF PROFESSIONAL ENGINEERS OF ONTARIO

PROFESSIONAL PRACTICE EXAMINATION – April 7, 2018

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.

Any similarity in the questions to actual persons or circumstances is coincidental.

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) PEO's Discipline Committee has the power to revoke or suspend any of the licences issued by PEO if the licence holder commits professional misconduct. Besides revocation and suspension, describe three (3) other penalties or sanctions that the discipline committee may impose.

(5) (b) What are the limits of the "Limited License"? **(In your answer, <u>DO NOT</u> discuss the qualifications/requirements for obtaining this license**)

(10) (c) Sigma is a professional engineer with 20 years of experience, licenced in Manitoba and with his own engineering firm. Sigma's firm has been hired by a company in Ontario to conduct an engineering study for them.
What specific licences or approvals does Sigma or his firm require from PEO? Explain.

(5) (d) What is the principal object of Professional Engineers Ontario?

Question 2

Black is a P.Eng. employed by EngInc, an engineering company. As a senior project engineer, Black is in charge of a project for Big Guy, an important client of EngInc. Big Guy and Black have several disagreements over the design that Black has developed. Big Guy wants a cheaper, more conventional solution. Black is convinced that the design is a "masterpiece" and believes that Big Guy "doesn't have an ounce of imagination". Black simply shrugs off Big Guy and refuses to discuss any other alternative.

Big Guy is furious and phones White, P.Eng., the President of EngInc, to yell and complain about Black. Big Guy threatens to hire another engineering firm to complete the design according to Big Guy's wishes.

You also work for EngInc as a senior design engineer. White calls you into a private office and closes the door. White asks you to review Black's design and instructs you to keep the review a secret from Black. White explains that Black is a senior engineer who has been with EngInc for 28 years and could be "a bit sensitive at times".

Using PEO's Codes of Ethics and Professional Misconduct as your guide.

(15) (a) Should you undertake this work? What are your obligations to EngInc. and Black? What do you tell White?

(10) (b) Please comment on Black's conduct in dealing with Big Guy. How should Black have responded to Big Guy's request?

Question 3

Great Engineering Ltd. ("Great") was engaged by BigPharma to design a new production line at its pharmaceutical plant in Ontario. In addition to preparing the design, Great would provide professional services during the installation of the project.

You are a professional engineer employed by Great. The president of Great (who is also a professional engineer) has been very impressed with your work over the years and has personally requested that you be assigned to BigPharma's project to act as project manager. This is a very important job for Great and the assignment represents an important career opportunity for you by providing potential promotion opportunities.

The completed design of the new production line includes a sophisticated new proprietary quality control system (designed and manufactured by Labeltech Corp. ("Labeltech)). The system employs laser coding and machine vision to accurately identify and label injection bottles containing various drugs that will be produced at the new facility. The technology uses a laser to code the cap of each injection bottle immediately after it is filled. After the bottles are sterilized, filled and transported through the system, a scanner reads the laser codes on the bottle caps and the appropriate labels are automatically printed and applied to the bottles. With the system, wrongly labelled bottles would be eliminated.

The project has progressed well (both on schedule and on budget) and is ready for start up, commissioning and testing. Unfortunately, during testing, the quality control system malfunctions and incorrectly labels 20% of the bottles. Labeltech's technical personnel at the site are able to fix a number of problems contributing to the malfunction, and the error rate is reduced to 3%. Labeltech advises you that it will be unable to eliminate the remaining error without redesigning, manufacturing and testing a scanning component; a process which is expected to take at least two months.

You e-mail the bad news about the delay to BigPharma. The next day, BigPharma's project representative sends you an e-mail instruction that the production line be accepted with the 3% error rate. BigPharma's project representative explains that BigPharma is planning to use the new production line to manufacture a new patented drug which will benefit thousands of people, saving many lives. Given the immediate demand for the drug, a two-month delay is not acceptable. The representative also indicates that BigPharma's and Great's presidents have already discussed the problem and have agreed that BigPharma would assume responsibility by legally indemnifying Great for any liability that could arise from the incorrect labelling.

Using PEO's Codes of Ethics and Professional Misconduct as your guide.

(10) (a) Discuss your duties to the public. How do you evaluate the impact on the public interest? Does the drug's potential benefit to thousands of people affect your duties? Discuss.

(5) (b) Do you have any duties to BigPharma and to your employer? What are they?

(5) (c) Are you able to fulfill all of your duties above? If not, what should you do?

(5) (d) What are the potential consequences to you if you do not fulfill your duties? Does BigPharma's promise to assume responsibility change things?

Question 4

TestCo is a products testing company. Typically, TestCo is hired by various manufacturers to perform tests on their products in order to verify that the products are manufactured according to published standards.

You are a professional engineer and have been employed for several years on a full-time basis as an employee of TestCo. In your job, you are responsible for supervising the application of tests on various products. During your years of employment with TestCo you have acquired a great deal of expertise regarding the design and manufacture of small household appliances and have earned an excellent reputation.

Given your reputation and expertise, manufacturers of such appliances are often interested in hiring you on a private basis (i.e. outside of your employment with TestCo) to provide input on their product designs. You are able to supplement your income by occasionally undertaking such work for them. You perform this work on weekends and during evenings.

One day, while at work at TestCo, you are assigned the job of supervising the tests and issuing a report on a new product that has been submitted to TestCo. You realize that the product was submitted by one of your own manufacturing clients and that you provided design input on the product. This will be an easy review for you to complete.

Using PEO's Codes of Ethics and Professional Misconduct as your guide.

(10) (a) Discuss the appropriateness of how you have set up your general working arrangement, outlining what steps you should take.

(10) (b) How should you deal with the testing of this specific new product?

(5) (c) Is a P.Eng. licence sufficient to permit you to provide such design input to your own manufacturing clients? Explain.

ASSOCIATION OF PROFESSIONAL ENGINEERS OF ONTARIO

PROFESSIONAL PRACTICE EXAMINATION – April 7, 2018

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.

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 "B". Each of the four questions is worth 25 marks.

ASSOCIATION OF PROFESSIONAL ENGINEERS OF ONTARIO

PROFESSIONAL PRACTICE EXAMINATION April 7, 2018

PART "B" - Engineering Law and Professional Liability

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 "B". Each of the four questions is worth 25 marks.

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

(i) Secret commission
(ii) Consideration
(iii) Fraudulent misrepresentation
(iv) Dispute resolution board
(v) Contra proferentem
(vi) The difference between mediation and arbitration
(vii) The New York Convention
(viii) The discoverability concept

25) 2. An Ontario municipality (the "Owner") decided to call for bids on a significant portion of a major tunnel project designed to carry treated wastewater from its waste water treatment plant to Lake Ontario. To do so, the Owner planned to invite competitive tenders from contractors for the construction of the tunnel. The tunnel was designed for installation more than fifty meters below grade, using a specified tunnel boring machine.

The Owner's consultant on the project, a professional engineer, designed the tunnel project and prepared the Tender Documents to be given to contractors interested in bidding on the project. Each of the bidders was required to be prequalified and approved by the Owner for participation in the bidding. The Tender Documents included the Plans and Specifications, the Tendering Instructions which described the tendering procedure and other requirements to be followed by the bidders, the Tender Form to be completed by the bidders, the form of written Contract that the successful contractor would be required to sign after being awarded the contract, and a number of other documents.

According to the Tendering Instructions, each tender bid as submitted was to remain "firm and irrevocable and open for acceptance by the Owner for a period of 60 days following the last day for submitting tenders". The Tendering Instructions also provided that all bids were to be submitted in accordance with the instructions in the Owner's Tender Documents and that the Owner was not obligated to accept the lowest or any tender.

Tenders were submitted by five bidders, three of whom were from countries other than Canada. All bids were submitted in accordance with the Owner's Tender Documents. The lowest bid was well within the Owner's budget.

Within the 60 days specified and before the Owner's consultant had made a recommendation to the Owner as to whom the contract should be awarded, the consultant was called to a meeting with a prominent member of the Municipal Council who noted that

the lowest bidder was not one of the two bidders who were "local contractors" from within the Municipality. The Councillor expressed a very strong view that the contract should in fact be awarded to a local bidder.

.There had been no reference in the Tendering Instructions to any preference being shown to local contractors.

How should the consultant deal with the political pressure being applied by the Council member?

If the contract is awarded to the lowest local bidder what potential liabilities in contract law may arise? If the consultant engineer recommends to the Owner that the contract be awarded as the Councillor suggests what liabilities may arise for the engineer? Please provide your reasons and analysis.

25) 3. 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.

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.

25) 4. An Ontario municipality ("the Municipality") retained an architect to design a new corporate head office building. The Municipality, 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 the Municipality 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 tests.

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

The vice- president stated in a letter to the Municipality, that based on the 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 the Municipality.

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 the Municipality, 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.