



# UNIVERSITY OF JOHANNESBURG

9 June 2016

COURSE: Engineering Ethics

TIME: 90 minutes

QUESTION PAPER: 1

MARKS: 100

SUBJECT CODE: CPS3A01

EXAMINERS:

1. Mr A.D. Erasmus

EXTERNAL MODERATOR:

1. Mrs Y.M. Coetser (UNISA)

**(THIS QUESTION PAPER CONSISTS OF TWO (2) PAGES)**

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1. ANSWER **ALL** THE QUESTIONS IN SECTION A
  2. ANSWER **ONE** QUESTION FROM SECTION B
  3. ANSWER **BOTH** SECTIONS
  4. CLEARLY INDICATE WHICH QUESTION YOU ARE ANSWERING
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## SECTION A

1. Describe two models of professionalism. (6)
  2. In law, what four conditions must be met in order to successfully be charged with negligence? (4)
  3. Briefly explain the problem of fractured responsibility/many hands. (2)
  4. Identify five symptoms of *groupthink*. (5)
  5. Identify and explain four forms of dishonesty in the engineering profession. (8)
  6. Define *sustainable development*. (10)
  7. Identify five criteria for a "clean" environment. (5)
- Total (40)**

## SECTION B

Answer one of the following two questions:

1. Read “*Oil Spill?*” and answer the following questions:
  - a. What are the ethical issues in this case?
  - b. What factual and conceptual questions need to be addressed?
  - c. How do you think Peter should deal with this situation?

(60)

OR

2. Provide a summary of your understanding of the relationship between engineers and the environment. Why is it important for engineers to have environmental obligations?
  - a. Discuss the relationship between engineers and the environment.
  - b. Discuss your views on the importance of environmental obligations of engineers.
  - c. Provide good reasons for your views on the environmental obligations of engineers.

(60)

TOTAL (60)

GRAND TOTAL (100)

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### *Oil Spill?*

Peter has been working with the Bigness Oil Company’s local affiliate for several years, and he has established a strong, trusting relationship with Jesse, manager of the local facility. The facility, on Peter’s recommendations, has followed all of the environmental regulations to the letter, and it has a solid reputation with the state regulatory agency. The local facility receives various petrochemical products via pipelines and tank trucks, and it blends them for resale to the private sector.

Jesse has been so pleased with Peter’s work that he has recommended that Peter be retained as the corporate consulting engineer. This would be a significant advancement for Peter and his consulting firm, cementing Peter’s steady and impressive rise in the firm. There is talk of a vice presidency in a few years.

One day, over coffee, Jesse tells Peter a story about a mysterious loss in one of the raw petrochemicals he receives by pipeline. Sometime during the 1950s, when operations were more lax, a loss of one of the process chemicals was discovered when the books were audited. There were apparently 10,000 gallons of the chemical missing. After running pressure tests on the pipelines, the plant manager found that one of the pipes had corroded and had been leaking the chemical into the ground. After stopping the leak, the company sank observation and sampling wells and found that the product was sitting in a vertical plume, slowly diffusing into a deep aquifer. Because there was no surface or groundwater pollution off the plant property, the plant manager decided to do nothing. Jesse thought that somewhere under the

plant there still sits this plume, although the last tests from the sampling wells showed that the concentration of the chemical in the groundwater within 400 feet of the surface was essentially zero. The wells were capped, and the story never appeared in the press.

Peter is taken aback by this apparently innocent revelation. He recognizes that state law requires him to report all spills, but what about spills that occurred years ago, where the effects of the spill seem to have dissipated? He frowns and says to Jesse, “We have to report this spill to the state, you know.”

Jesse is incredulous. “But there *is* no spill. If the state made us look for it, we probably could not find it; and even if we did, it makes no sense whatever to pump it out or contain it in any way.”

“But the law says that we have to report . . .,” replies Peter.

“Hey, look. I told you this in confidence. Your own engineering code of ethics requires client confidentiality. And what would be the good of going to the state? There is nothing to be done. The only thing that would happen is that the company would get into trouble and have to spend useless dollars to correct a situation that cannot be corrected and does not need remediation.”

“But . . .”

“Peter, let me be frank. If you go to the state with this, you will not be doing anyone any good—not the company, not the environment, and certainly not your own career. I cannot have a consulting engineer who does not value client loyalty.”