

**ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)**  
**ORGANISATION OF ISLAMIC COOPERATION (OIC)**  
**Department of Computer Science and Engineering (CSE)**

**MID EXAMINATION****SUMMER SEMESTER, 2019-2020****DURATION: 1 Hour 30 Minutes****FULL MARKS: 75**

**HUM 4441: Engineering Ethics**

**Programmable calculators are not allowed. Do not write anything on the question paper.**

Figures in the right margin indicate marks.

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1. A scenario is presented below, and you are playing the role of the main character. Please read it thoroughly.

You are working as an engineer in a power distribution company. One of your responsibilities is to check the high-voltage power supply lines in your areas. During such an inspection, you have found some critical problems in power supply lines in one of those areas. The complete electricity supply network will be disrupted in that area and some nearby areas while repairing the high-voltage lines as the electricity supply will be off from the national grid to carry out the repair work.

However, there is going to be a cricket match of Bangladesh on that day. Thousands of people will enjoy the match through the live telecast. If you decide to repair the power supply lines, thousands of people living in that area and the nearby areas will not be able to enjoy the match, which could cause huge public dissatisfaction. On the contrary, the fault in power supply lines may cause severe damage in that area, including losing lives and properties.

You are in a dilemma to make the right call!

Answer the following questions based on the scenario described above. While writing your answer - use appropriate terms, don't stretch the answer unnecessarily, and don't be superficial or vague.

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| a) What is the morally right thing to do in this case? Explain your answer within the context of the ethical theories – Utilitarianism, Kantian Theory, and Virtue Ethics.   | 12 |
| b) Are these theories leading to the same consequence? What is the intuitive option here? Justify your stand.  | 3  |
| c) Based on your answer in Question 1.(a), criticize the outcome of applying each of the ethical theories mentioned above.   | 5  |
| d) How does the 'Rule Utilitarianism' change the outcome of a moral dilemma in a situation described in Question 1. Explain how it differs from the 'Act Utilitarianism,' which is the classical form of utilitarianism. | 5  |
| 2. Answer any four questions, including 2.(e), which means you have to answer any three from 2.(a) – 2.(d).  |    |
| a) Explain the differences between the 'burden of proof' and 'precautionary principle' concerning the scenario mentioned above in Question 1.  | 6  |

- b) Suppose you have not taken any measure to repair the faulty power supply lines described in Question 1. Later on, the same day, if the fire catches due to the defective power supply lines' short circuit, are you blameworthy? Justify your answer using appropriate terms. 6
- c) Suppose you have taken appropriate measures to repair the faulty power supply lines described in Question 1. Thousands of people could not enjoy the live cricket match of Bangladesh because of the disrupted power supply. They put a demonstration in front of your company out of their dissatisfaction and anger. During the rally, people got out of control and shattered windows, door glasses of your company. The next morning, the company's CEO called for you and scolded you because of your apathy towards 'what is good for the company.' How would you respond back to such a situation? Describe and justify your stand using appropriate terms. 6
- d) Compare and contrast the terms 'professional integrity' and 'institutional loyalty' based on the scenario described in Question 1. 6
- e) How could you systematically solve the moral dilemma you faced as per the scenario presented in Question 1? Describe each step of the systematic approach you followed to solve the moral dilemma. 7

3. a) Explain the situations when taking risks are ethical. Suppose you have not taken any measure to repair the faulty power supply lines described in Question 1. You have taken a risk by doing so. Criticize your decision of taking risk according to the situations when risks become ethical. 4+3

- b) The following probability distribution shows the probability of nature (degree) of faults found at a particular point in high-voltage power distribution lines. 8

Degree of Fault	Probability
3 (critical)	0.1
2 (serious)	0.4
1 (regular)	0.5

The following probability distribution shows the probability of different amounts of monetary damages when there is an accident due to a fault in high-voltage power supply lines.

Amount of Damage due to a fault	Probability
BDT 500000	0.2
BDT 150000	0.4
BDT 50000	0.4

Calculate the expected amount of damage in monetary units based on the abovementioned probability distributions.

- c) Comment on the severity of risk (e.g., high, medium, low) as described in Question 3.(b) using a 3X3 risk matrix. 4
- d) Assume that you have checked a high-voltage power supply lines in 50 points. In your opinion, there were 25 faulty points, among which 20 points were actually faulty. The actual total number of faulty points is 30. Find the accuracy of your testing and the percentage of Type I and Type II errors using a confusion matrix. 6