

**IQRA NATIONAL UNIVERSITY**

Phase-1 Phase 2 Hayatabad, Peshawar, Khyber PakhtunKhwa

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| **ASSIGNMENT NO 1** | **FINAL TERM** |
| **COURSE TITLE** | **RISK & DISASTER MANAGEMENT IN CONSTRUCTION** |
| **SUBMITTED TO** | **SIR ENGR.YASEEN MEHMOOD** |
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| **REGISTRATION NO** | **14043** |
| **DEPARTMENT** | **CIVIL ENGINEERING** |
| **MODULE** | **MS(CEM)** |
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**QUESTION 1**

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| **What is the difference between hazards and threats? Provide examples** |

1. **What Is a Hazard….?**



A [hazard in safety management](http://aviationsafetyblog.asms-pro.com/blog/what-is-a-hazard-in-safety-management-systems) is a condition that poses danger to your organization, and can lead to an accident, incident, or other mishap if not mitigates.

1. **A hazard satisfies all of the following conditions**:
* Is a dangerous condition, such as an object, situation, circumstance, that poses an [unacceptable level of danger](http://aviationsafetyblog.asms-pro.com/blog/how-to-define-acceptable-level-of-safety-alos-in-aviation-safety);
* Occurs oncein the safety mishap lifecycle;
* Canlead directly to risk occurrence (i.e., safety mishap, accident, etc.) if not mitigated; and
* Arise from hazard mechanisms, such as initiating actions and hazardous sources.
1. **Though it is sometimes confused as other things, such as below, a hazard is NOT**:
* Benign objects (birds, mountains, people), which are hazardous sources;
* Safety mishaps, which are another way of saying risk occurrences;
* Damages, which are a product of risk occurrence; and
* Dangerous actions, which are associated with initiating mechanisms.

The only disagreement may be on what constitutes a “dangerous” situation. We advise you seek guidance from your compliance authority on this point.

**Two Types of Threats**

There are two types of threats that are used differently in different contexts. They are:

* General threats: the amount danger in a given circumstance; and
* Specific threats: a specific object, situation, behavior, etc., that corresponds to a rising level of danger within a given context.

**What Is a General Threat…?**

One type of threat is a general threat,which refers to the amount of danger in a given circumstance. It is used in the context of “threat level,” such as:

* “There is no inherent threat in operations right now”; or
* “Given our current ERP, how much threat does a fire emergency pose?”; or
* “Terrorism is a [specific] threat that poses great [general] threat to aviation.”

**What Is a Specific Threat….?**

A threat can also be a generic term for a specific danger, such as an object, situation, behavior, etc. A specific danger can be identified as:

* Contributing to rising danger – such as a hazardous source or contributing factor; or
* Representing actualized danger – such as a hazard occurrence.

**Some examples are:**

* “In spring time, migrating birds are a threat we have to mitigate”;
* “That moose is no threat because he cannot get over the perimeter fence”; or
* “We have no plan for a bomb threat in our ERP.”

**Difference between Hazard and Threat**

Sometimes, hazard and threat might be used interchangeably. Consider the example of a flock of birds flying close to an aircraft. This flock is both a hazard and a threat.

However, because the concept of a threat is vaguer than the concept of a hazard, a threat is not always a hazard. Consider the example of:

* migrating birds, which are a hazardous source but not an actual hazard, or
* Fatigue, which is a contributing factor.

The takeaway here is that a hazard occurs (is “actualized”) when your operations interact with hazard sources. A threat is simply a generic way to describe danger, whether the danger has actualized or not.

**QUESTION 2**

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| **Define risk and provide classification of risk based on its sources. Provide an example for each risk source.** |

**RISK**: - Risk is the possibility of something bad happening. Risk involves uncertainty about the effects/implications of an activity with respect to something that humans value (such as health, well-being, wealth, property or the environment), often focusing on negative, undesirable consequences.

Possibility of loss or injury: peril.

 Someone or something that creates or suggests a hazard.

The chance of loss or the perils to the subject matter of an insurance contract also: the degree of probability of such loss.

Identifying risk sources provides a basis for systematically examining changing situations over time to uncover circumstances that affect the ability of the project to meet its objectives. Risk sources are both internal and external to the project. As the project progresses, additional sources of risk can be identified. Establishing categories for risks provides a mechanism for collecting and organizing risks as well as ensuring appropriate scrutiny and management attention to risks that can have serious consequences on meeting project objectives.

* **Example Work Products**
1. Risk source lists (external and internal)
2. Risk categories list
* **Sub Practices**
1. **Determine Risk Resources**

Risk sources are fundamental drivers that cause risks in a project or organization. There are many sources of risks, both internal and external to a project. Risk sources identify where risks can originate.

**Typical internal and external risk sources include the following:**

* Uncertain requirements
* Unprecedented efforts (i.e., estimates unavailable)
* Infeasible design
* Competing quality attribute requirements that affect solution selection and design
* Unavailable technology
* Unrealistic schedule estimates or allocation
* Inadequate staffing and skills
* Cost or funding issues
* Uncertain or inadequate subcontractor capability
* Uncertain or inadequate supplier capability
* Inadequate communication with actual or potential customers or with their representatives
* Disruptions to the continuity of operations
* Regulatory constraints (e.g. security, safety, environment)

Many of these sources of risk are accepted without adequately planning for them. Early identification of both internal and external sources of risk can lead to early identification of risks. Risk mitigation plans can then be implemented early in the project to preclude occurrence of risks or reduce consequences of their occurrence.

1. **Determine risk categories**

Risk categories are “bins” used for collecting and organizing risks. Identifying risk categories aids the future consolidation of activities in risk mitigation plans.

The following factors can be considered when determining risk categories:

* Phases of the project’s lifecycle model (e.g., requirements, design, manufacturing, test and evaluation, delivery, disposal)
* Types of processes used
* Types of products used
* Project management risks (e.g., contract risks, budget risks, schedule risks, resource risks)
* Technical performance risks (e.g., quality attribute related risks, supportability risks)

A risk taxonomy can be used to provide a framework for determining risk sources and categories

QUESTION 3

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| **How would you assess the performance of a transportation system of a city?** |

**What is Transportation System?**

[**Transportation system**](https://www.lawinsider.com/dictionary/transportation-system) means the state transportation infrastructure and related systems, including highways and toll roads open to the public and associated rights-of-way, bridges, vehicles, equipment, park and ride lots, transit stations, transportation management systems, intelligent vehicle highway systems, and other ground transportation systems.

**Role of Transportation System:**

* Transportation system plays an important role as transport hubs. Dealing with transport issues in urban areas is complex due to various operating modes, diverse travel patterns and the magnitude of traffic volumes.
* Efforts to address urban traffic issues have traditionally focused on providing more facilities and services to vehicle users. Given that cities are transport points for the movement of both human and freight, urban transport systems and services are intricately linked to urban forms and spatial structures. Traditional approaches to traffic management could be revisited with a new urban mobility paradigm resulting from evolving urban transport modes and smart technologies, including intelligent transport systems.
* The New Urban Agenda2 emphasized the urgent need to tackle urban transport challenges. In the annex to the Ministerial Declaration on Sustainable Transport Connectivity in Asia and the Pacific, 3 endorsed by the Economic and Social Commission for Asia and the Pacific (ESCAP) in its resolution 73/4, it was acknowledged that the major urban transport challenges member States and cities in the region faced included extending coverage, managing congestion, reducing emissions and air pollution, enhancing safety and ensuring affordability. Also recognized was the role of new technologies in increasing the efficiency, safety and effectiveness of transport systems.
* The present document contains information on the status of urban transport systems and services in the region and on the sustainable urban transport index for cities in Asia and the Pacific, as well as the results of and progress towards its application. Challenges and issues related to intelligent transport systems applications are also reviewed, as are cases of their use to improve the operational efficiency of urban transport systems in region.
* Road fatalities among vulnerable road users, namely motorcyclists, cyclists and pedestrians, and urban road safety are a cause of concern in the region. Road traffic deaths among vulnerable road users account for 55 per cent of total road traffic fatalities.

**Assessment of urban transport systems and services**

* The provision of sustainable urban transport is becoming a major issue due to rapid urbanization worldwide, including in the Asia-Pacific region. The adoption of the 2030 Agenda for Sustainable Development, 18 with its 17 Sustainable Development Goals, adds new impetus to efforts to address global development challenges, including urban transport. Sustainable Development Goal target 11.2 focuses on improving accessibility for all, with an emphasis on public transport.
* Measuring the state of urban transport and evaluating urban transport policies and their implementation can support assessments of urban transport contributions to sustainable development. Increasingly, selected urban transport indicators and indices are useful for the assessment of urban transport systems and services and also reflect the state of urban transport performance among cities. There is, however, no established system of indicators and indices to measure, monitor and report on sustainable transport for cites in the Asia-Pacific region.
* Within the urban transport theme included in the Regional Action Programme for Sustainable Transport Connectivity in Asia and the Pacific, phase I (2017–2021), a study on the assessment of urban transport systems was envisaged. A collaborative research study was embarked on in 2016 to identify key urban transport indicators that could constitute an index to measure the sustainability of urban transport systems and policies in the Asia-Pacific context.
* The concept of a sustainable urban transport index was presented at the Expert Group Meeting on Planning and Assessment of Urban Transportation Systems, held in Kathmandu in September 2016. The Meeting supported the concept and provided feedback on identifying indicators and developing an index. The Regional Meeting on Sustainable Urban Transport Index, held in Jakarta in March 2017, finalized the index and recommended that the Committee of Transport, at its fifth session, in 2018, consider endorsing the sustainable urban transport index for its regional application in Asian cities.

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| **No** | **Indicator** | **Measurement Units** | **Weight** | **Range** |
| **1** | The extent to which transport plans coverpublic transport, intermodal facilities andinfrastructure for active modes | 0–16 scale | 0.1 | **Min** | **Max** |
| 0 | 16 |
| **2** | Modal share of active and publictransport in commuting  | Trips/mode share | 0.1 | 10 | 90 |
| **3** | Convenient access to public transport service | Percentage of population | 0.1 | 20 | 100 |
| **4** | Public transport quality and reliability | Percentage satisfied | 0.1 | 30 | 95 |
| **5** | Traffic fatalities per 100,000 inhabitants | Number of fatalities | 0.1 | 0 | 35 |
| **6** | Affordability – travel costs as part of income | Percentage of income | 0.1 | 35 | 3.5 |
| **7** | Operational costs of the public transport system | Cost recovery ratio | 0.1 | 22 | 175 |
| **8** | Investment in public transport systems | Percentage of total investment  | 0.1 | 0 | 50 |
| **9** | Air quality (particulate matter of 10 micrometers) | microgram/m3 | 0.1 | 150 | 10 |
| **10** | Greenhouse gas emissions from transport | Carbon dioxide equivalent tons/capita/year | 0.1 | 2.75 | 0 |

* With these indicators, the index is a comprehensive assessment tool that incorporates urban transport systems and the social, economic and environmental dimensions of sustainable urban transport systems and services.
* The indicators on urban transport plans and modal shares of active and public transport represent the urban transport system dimension. It will enable cities to evaluate how comprehensive their urban transport master plan is and whether the plan includes facilities for intermodal transfer, pedestrians and cyclists as well policies to increase public transport modal share.
* 28. The indicators on accessibility, road safety, quality and reliability of public transport, and affordability represent the social dimension of urban transport systems and services. Their assessment will enable cities to initiate policies to improve on those indicators.
* The indicators on operational costs and investment in public transport systems represent the economic dimension. Their assessment will enable cities to evaluate the state of investment made in public transport and how the public transport service is generating revenue. Their assessment result will enable city authorities to initiate policies to increase investment in public transport and possibly to review fares.
* Finally, the indicators on air quality and greenhouse gas emissions represent the environmental dimension. Their assessment will enable cities to evaluate the environmental impact of public transport systems. Policies on fuel quality, the use of alternate energy, emissions standards and vehicle maintenance will help to improve air quality and greenhouse gas emissions.
* Indicators on different scales need to be normalized before comparison and aggregation are possible. The linear rescaling method that is applied for the index is a common approach in composite index design. This allows for a simple transformation to a linear scale of 1–100 for each indicator. The minimum and maximum ranges are defined as the lowest and highest value found or expected for each indicator based on real performance and information in the literature, with consideration given to the context of Asia and the Pacific. The index is derived by geometric aggregation of the 10 indicators and equal weightage is applied for all 10 indicators.
* The most important factor in the application of the index is the availability of suitable, consistent and reliable urban transport data. Without data, even the most sophisticated index is useless. Data need to be collected using similar methods and need to be regularly updated. Therefore, additional efforts by city authorities are needed to collect and compile data for the 10 indicators.
* One of the important user-friendly outputs of the analysis is the display of results in a spider diagram. The visual display of the state of each indicator in a city easily allows policymakers to comprehend the system and focus on the indicators which have low values (which will appear near the centre of the circle).
* The figure below shows an example of a spider diagram wherein the state of each indicator can be observed. A high value (near the outer circle of the diagram) indicates good results, whereas the opposite is the case for a low value. Based on this result, the city could consider if there were areas where it would like to focus more, or areas where additional data should be required and examined more closely. Repeating the exercise at regular intervals would allow a city to track performance and results over time.



**Key findings from the pilot application**:

**1**. The pilot application of the index was conducted and completed in four cities in 2017: Colombo; greater Jakarta; Hanoi; and Kathmandu.

**2**. The secretariat supported each pilot city on data collection, provided advisory services and organized a consultation meeting in each city to discuss the data collection approach for the 10 indicators and the analysis and preparation of the report. The visits to the four pilot countries and cities took place from July to September 2017.

**3**. The pilot countries and cities designated a focal point to coordinate data collection and to prepare an analysis report. In order to support a standardized approach in data collection and analysis, a monograph series on the assessment of urban transport systems, a sustainable urban transport index data collection guideline and a Microsoft Excel calculation sheet were developed and provided to the focal points. Despite the short project time frame, all four pilot cities were able to collect data for the indicators and produced analysis reports.

**4**. The index number was 52.5 for greater Jakarta, 47.8 for Kathmandu, 32.7 for Colombo and 32.2 for Hanoi. A higher index number suggests a higher overall performance of assessment. Pilot city authorities have already started interpreting the results of the assessment and drawing implications for their urban transport planning policies.

**5**. The city authorities of greater Jakarta have been investing in two mass transit systems and have developed an integrated urban transport plan. The road safety indicator showed a good road safety situation. Based on the analysis, the greater Jakarta city authorities have identified that additional efforts are required in the following areas:

**(a)** To extend public transport accessibility, which is currently at 49 percent.

**(b)** To increase the mode share of public transport, which is currently at 27 percent.

**(c)** To improve air quality, including through strategies to reduce pollutant particles particulate matter of 10 micrometers or less, which was measured at 82 micrograms/m3 , annual mean value, and exceeded World Health Organization guidelines (20 micrograms/m3 ) and was ranked one of the highest in the region.

QUESTION 4

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| **Define security vulnerabilities of university campus?** |

**Definition of Security vulnerabilities:**

An unintended flaw in software code or a system that leaves it open to the potential for exploitation.

In computer security, a vulnerability is a weakness which can be exploited by a threat actor, such as an attacker, to perform unauthorized actions within a computer system. To exploit a vulnerability, an attacker must have at least one applicable tool or technique that can connect to a system weakness.

Security Vulnerability of University:

Sometimes it seems like the security challenges facing American colleges and universities are never-ending.

Students and others share user information. Campus visitors pop USB sticks into networked machines. Hackers find their way into an internal network through carelessly discarded information from an open screen or from an infected workstation.

Here are six of the things that keep campus security people up at night, and big challenges that schools should address to make themselves more resistant to cyber threats.

1. **Phishing and Social Engineering Attacks:**

One of the biggest challenges with university cyber security is the sheer amount of hacking that goes on in these environments. Schools have to deal with a unique mix of user levels, including students who are often young, and relatively trusting, and are not employees of the organization — so they’re less controlled.

For example, research shows a full [90% of malware attacks](https://www.infosecurity-magazine.com/news/90-of-unknown-malware-is-delivered-via-the-web/) originate through e-mail. Various types of spoofing and spear-phishing campaigns entice students and others to click on illegitimate links that can usher in a Trojan Horse to do damage to a network system, or compromise the security of information. Many of these kinds of phishing are cost, high — which leads to an inundation of hacker activity that schools have to keep in top of, by somehow segmenting network systems, by shutting down compromise parts of the system, or by some other high-tech means.

With this in mind, better security often starts with identifying separate pools of users — for example, administrative staff versus faculty and students, and then customizing controls and access for each of these groups individually

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1. **The IT Crunch: Limited Resources:**

The challenge of limited resources and funding for university cyber security generally speaks for itself. The above kinds of network monitoring and cyber security engineering have significant costs attached to them, and many universities simply find it difficult allocate the manpower or the funding to address cyber security issues.

1. **Regulatory Burdens and Secure Data Efforts:**

Another part of this challenging cyber security environment is that schools and universities have big compliance burdens under many different types of applicable regulation.

Some campus leaders tend to focus on items like NIST 800-171 and the use of controlled unclassified information, just because there is a deadline on for this particular type of compliance right now. However, [regulations like FERPA](https://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html) are also critical. Even HIPAA puts pressure on schools to tighten up cyber security, since as healthcare providers, schools may hold student health data. Third-party cloud providers often offer FEDRAMP certification and other qualifications for cyber security on their side of the fence — but that doesn’t fully bring a university into compliance unless it can bring its own internal systems up to standards.

1. **System Malware — Zero Day Vulnerabilities and More:**

Universities and colleges also have to anticipate situations where hackers may exploit existing system vulnerabilities. They have to look at continuing support for operating systems and other technologies.

There is a reasonable expectation that manufacturers will make adequate security available, but this doesn’t absolve the university of having to look for security loopholes and close them. This means evaluating architectures — for example, can hackers get host names, IP addresses and other information from devices like printers?

It also means using multi-factor authentication to control user activity. It means understanding how malware will enter a system, and anticipating attacks. The good news is that modern security tools go well beyond the perimeter of a network to seek out harmful activity if they are set up right and controlled and observed well, they can dramatically decrease risk.

1. **Protecting Personally Identifiable Information:**

At the heart of many of these cyber security efforts is the daunting struggle to protect all sorts of personally identifiable information, from simple student identifiers to financial data and medical data, from grades to Social Security numbers and items that identity thieves might use. The above-mentioned regulations are part of the drive to secure this type of data, along with more general standards and best practices for enterprise. Simply put, data breaches cost money, both in damage control, and in the reputation of the school itself.

Another strategy is to use internal monitoring tools to inspect network traffic for suspicious activity.

For example, peaking at the header and footer of data packets can show the origin of data transfers, unless there is spoofing or some sophisticated type of deception involved. Some schools will go further and fully decrypt data packets to see what’s inside them. However, this practice can involve getting into the philosophy of privacy, where schools are wary of digging into network traffic because they see their monitoring as too intrusive to students or other users. In addition, emerging European privacy standards may put some pressure on schools in the U.S. to limit decryption and observation activities.

1. **End-User Awareness and Training:**

Another way for schools to increase safety is for them to conduct vibrant types of end-user awareness campaigns.

This starts with educating end-users on how malware gets into a system — asking them not to click on suspicious e-mails or use inbound links, but instead to always do online banking and perform other transactions through a secure website.

Schools can also educate on the kinds of data that are most likely the targets of hacking activity — research data, student grades, health information or other sensitive data sets that hackers really want to get their hands on.

On the other side of the equation, schools should also work on improving their internal security postures — figuring out how they will respond to attacks, and how they will preemptively safeguard systems against everything from phishing to ransom ware.