ASSIGNMENT

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Q: 01:

Safety management defines a hazard as a source of danger that may cause harm to an asset.

Hazard:

A hazard is identified by;

- A dangerous situation or object that poses a danger
- That have occurred at least once in the safety mishap lifecycle
- That could lead to direct risk occurrence
- That arise from a hazardous mechanism

Threat:

It is a potential cause of an incident. It is anything that could lead to exploitation of a vulnerability.

A threat may be a general threat or a specific threat.

a. General threat: Danger of any sort in each circumstance.
b. Specific threat: Something specific (a specific object or behavior) with potential to harm.

Hazard and threat might sometimes be used interchangeably. For instance, a flock of birds flying close to an aircraft is both, a hazard and a threat.

Explanation with example:

Inflammable material at a work site close to an ignition source (fire, spark etc.) or in hot weather without proper protection is a hazard because it is going to cause danger when it explodes, which inflammable material does in such a situation.

On the other hand, a flock of birds flying near a plane might be a source of danger, but not necessarily. A threat is not always a hazard.

Q:02:

Risk:

Definition: Risk is any possibility of suffering a loss.

The above definition has two aspects.

i. Some loss must be possible
ii. There must be uncertainty associated with that loss

There are four elements of risk.

i. Context: The background or environment in which risk is being viewed.
ii. Action: The occurrence that triggers the risk
iii. Condition: The set of circumstances that can lead to risk
iv. Consequences: The potential results of an action in combination with a specific condition.

Classification of risk based on its sources:

Threat category (Source)	**Threat elements**		**Examples**
	Trigger	**Vulnerability**	
Mission Threat	Process execution	A fundamental flaw in purpose and scope	Mission objectives are risky & vague and does not meet customer requirements & needs Insufficient funding, time, & resources. d
Design Threat	Process execution	An intrinsic flaw in the layout	Process not defined and documented, complex, inefficient, against policy and procedure. Vague roles. Lack of facilities
Activity Threat	Process execution	A flaw originated from management and performance activities	Lack of knowledge, skills, abilities, insufficient staff, lack of training, execution, defects in input activity, inputs not in time etc.
Environmental Threat	Process execution	A flaw in work environment	Lack of incentives & cooperation, staff morale, vague

			authority, harsh weathers, communication barriers, staff politics etc.
Event Threat	Event	Specific vulnerabilities in combination with trigger events that could cause risk	Surges in workload, loss of key staff, Cyber security breaches, physical security breaches, changes in mission, funding, technology, and customer needs etc.

Q:03:

Performance assessment of a transportation system of a city:

Performance evaluation is essential in understanding of plans and its effectiveness. All the metropolitan cities of the world are currently in rapid growth in industry, infrastructure, economic activities and population. These activities make them attractive for job seekers. As a result, there is increase in traffic congestion resulting in huge delays and environmental pollution. To tackle all this, better public transportation is needed, an attractive, safe and highly sophisticated public transport system.

The following evaluation techniques are best suited techniques according to researchers to evaluate the performance of a transportation system of a city.

1. SERVQUAL Model
2. Impact Score Technique (IST)
3. Important Performance Analysis (IPA)
4. Customer Satisfaction Index (CSI)
5. Ordered Logit Model (OLM)
6. Structural Equation Modeling (SEM)
7. Soft Computing Techniques

SERVQUAL model is the simplest model to assess service quality but it isn’t widely used because it fails to specify a proper model and its attributes are not consistent. The IPA and CSI based models provide good results but do not provide the reasons of each attribute on service quality. Upon analysis, it is evident that the SEM model is the most appropriate model for service quality measurement. It enables understanding of the impact of each variable on service quality and customer satisfaction.

Q:04:

Security Vulnerabilities of a University Campus:

Large networks security has always been an issue to IT managers and security analysts. Securing a large network and university network have similarities but their issues and challenges are different. Contemporary education gives high thoughts to IT technology for the improvement of students learning experience. Creation of a convenient and secure network system in an educational environment is a challenging task. University tends to have a weak centralize policies. This means that they have tendency toward decentralization. This is how universities have long been operated. Different departments have different IT departments, staff, and budget, the central IT group only provide bandwidth and high-level services. Decentralized IT group raises a challenge when it comes to policy making and policy enforcement.

Small IT groups do not usually focus on policy making and enforcement. Most of the universities have lenient IT policies and procedures. It lacks policy document (DO’s and DON’T’s) for student and staff. Students at university are considered to pose a high security risk to the university system.