


<b>Name:</b> <b>Enrolment No:</b>			
<p style="text-align: center;"><b>UPES</b> <b>End Semester Examination, May 2025</b></p> <p><b>Course: Environmental Risk Assessment</b> <b>Program: BTech (FSE)</b> <b>Course Code: HSFS 4025</b></p> <p><b>Semester : VIII</b> <b>Time : 03 hrs.</b> <b>Max. Marks: 100</b></p> <p><b>Instructions:</b></p>			
<p style="text-align: center;"><b>SECTION A</b> <b>(5Qx4M=20Marks)</b></p>			
S. No.		Marks	CO
Q 1	What is the conceptual framework of risk assessment?	4	CO1
Q2	Explain in detail the main objectives of conducting an EIA?	4	CO2
Q3	State the following in terms of criticality and purpose: 1. Incident investigation 2. Emergency response and planning.	4	CO1
Q4	<p>In Visakhapatnam, an industrial port city in Andhra Pradesh state on India’s east coast, a gas leak happened in a chemical plant from two 5,000-tonne tanks of liquid chemicals. According to a local police officer, it occurred as the plant was being restarted as coronavirus restrictions imposed in late March were eased. 10 people died and many were admitted to hospitals across the city with symptoms of vomiting etc.</p> <p>The Factories Inspector has been tasked to find out the root cause for the incident and recommend corrective measures as well as penalties. If he were to undertake a risk analysis of the gas leak then which analysis method he will select from below.</p> <p>1. Event Tree analysis 2. Fault Tree analysis</p> <p>When answering the question, support it with proper reasoning as to why a particular tree analysis is suitable for the Factories Inspector depending on his objectives.</p>	4	CO2
Q5	Write down the approach to conducting EIA studies?	4	CO1

<p align="center"><b>SECTION B</b> <b>(4Qx10M= 40 Marks)</b></p>			
Q 6	<p>Explain what should be included in a pre-feasibility report for EIA studies, and what guidelines should be followed when filling out Form 1 of EIA? OR</p> <p>Write an audit program for the following areas to be audited in the yearly safety risk assessment.</p> <ol style="list-style-type: none"> <li>1. Hazard Identification and Assessment</li> <li>2. Hazard Prevention and Control</li> </ol>	<b>10</b>	<b>CO2</b>
Q7	<p>Risk assessment is a process by which results of a risk analysis are used to make decisions either through comparison with risk targets or through relative ranking of risk reduction strategies. Discuss the objectives of Quantitative Risk Assessment.</p>	<b>10</b>	<b>CO3</b>
Q8	<p>What are the different types and objectives of HSE Audit? Write brief methodology which you will follow for conducting HSE audit .</p>	<b>10</b>	<b>CO2</b>
Q9	<p>Analyze the criteria and standards used for assessing significant environmental impacts in EIA? OR</p> <p>Describe the Prior Environmental Clearance Process for activities falling under category A and Category B Projects, as per the revised Notification issued on 14th September , 2006 for thermal power plant with schematic diagram. Explain various methodologies of EIA.</p>	<b>10</b>	<b>CO3</b>
<p align="center"><b>SECTION-C</b> <b>(2Qx20M=40 Marks)</b></p>			
Q 10	<p>Construct a <b>fault tree for a top event</b>: “Landslide in a under construction tunnel” and calculate its probability for the below scenario.</p> <p>In a developing country situated in the Himalayan region, significant investments are being made in highway development. Given the seismic activity along the Himalayas and the geopolitical context of bordering an adversary, the risk of non-state actors orchestrating sabotage, such as explosions in the mountains, is notably high. The ongoing construction of a road in the mountainous terrain includes the development of a tunnel.</p> <p>A team of safety specialists conducted an investigation into the potential risks, focusing on the possibility of explosions leading to landslides in the tunnel. Earthquakes pose a threat to the tunnel's integrity at a</p>	<b>20</b>	<b>CO4</b>

	<p>frequency of 0.2 per year, and landslide risk is contingent upon external factors such as bomb explosions or intense rainfall events, for example, sudden cloud bursts occurring approximately 0.6 times per year.</p> <p>The secret service estimated a terrorist bomb attack frequency of 1 per year, with a remarkably high security success rate of 99.9%.</p> <p>Additionally, there is a less likely scenario of a cyclone causing heavy rainfall at a frequency of <math>2.5 \times 10^{-4}</math> per year. Such heavy rainfall events have the potential to trigger landslides across all sections of the highway, including the tunnel</p>		
Q11	<p>Evaluate the outline of a Corporate Environmental Responsibility (CER) report? OR</p> <p>Write an <b>audit checklist</b> for the examination of specific areas mentioned below within a textile plant. Include <b>a minimum of three checklist items</b> for each area, which will be scrutinized during the audit fieldwork.</p> <ol style="list-style-type: none"> <li>1. Chemical safety and storage.</li> <li>2. Compressed air and compressed gases.</li> <li>3. Hazardous Waste &amp; Materials Disposal and Recycling.</li> </ol> <p>Safety Equipment and Emergency Preparedness</p>	20	CO4