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| **Name:**<br>**Enrolment No:** | |

**UPES**

**End Semester Examination, May 2025**

**Course: Advanced Safety and Risk Engineering** **Semester: VI**

**Program: B.Tech. Fire and Safety Engineering** **Time : 03 hrs.**

**Course Code: HSFS3036P** **Max. Marks: 100**

**Instructions: Read the question paper properly and provide the most relevant answer**

**SECTION A**
**(5Qx4M=20Marks)**

| S. No. | | Marks | CO |
|---|---|---|---|
| Q 1 | Differentiate safety risk and security risk | **4** | **CO4** |
| Q 2 | List out the safety measures that cannot be considered as Layers of Protection. | **4** | **CO1** |
| Q 3 | Discuss the applications of MCDM techniques in context of safety | **4** | **CO1** |
| Q 4 | Write one application of fuzzy in the context of safety. | **4** | **CO4** |
| Q 5 | Discuss the advantages of Probabilistic risk assessment over Deterministic risk assessment with an example. | **4** | **CO2** |
| | **SECTION B**<br>**(4Qx10M= 40 Marks)** | | |
| Q 6 | Explain the step-by-step procedure to carryout ANP with an example of your choice | **10** | **CO2** |
| Q 7 | Discuss the concept of LOPA in detail | **10** | **CO1** |
| Q 8 | Compare the types of uncertainty and explain them in detail with an example of your choice | **10** | **CO4** |
| Q 9 | Discuss the Bayesian Network analysis in detail.<br>(OR)<br>Differentiate and critically analyze AHP and ANP. | **10** | **CO2** |
| | **SECTION-C**<br>**(2Qx20M=40 Marks)** | | |
| Q 10 | Explain in detail the step-by-step procedure to carry out fuzzy analysis with an example of your choice. | **20** | **CO2** |
| Q11 | As a fire safety engineer, systematically apply Bayesian Network to find the risk of fire risk in a building considering various parameters that could influence the occurrence of fire. Can you an example case study of your choice. | **20** | **CO3** |

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| | (OR)<br>As you are a safety expert, apply LOPA technique to find the chances of fire in a building. Consider a case study of your choice and provide a step by step procedure. | | |