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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **Ph.D. Course Work End Term Examinations – JAN-FEB 2025** |
| **Date:** 03 – 02- 2025 **Time:** 09:30 am – 12:30 pm |

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| **School:** SOE | **Program:** Ph. D. | |
| **Course Code**: CIV825 | **Course Name:** Railway Safety and Management | |
| **Semester**: | **Max Marks**:100 | **Weightage**:50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **20** | **40** | **40** | **-** | **-** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

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| **Answer ALL the Questions. Each question carries 10 marks. 6Q x 10M=60Marks** | | | | |
| **1** | How can predictability and preparedness measures be applied to railway-related disasters? Discuss specific risk reduction techniques used in the industry. | **10 Marks** | **L1** | **CO1** |
| **2** | What are the advantages of periodic track maintenance over daily maintenance? Provide examples to illustrate these benefits. | **10 Marks** | **L1** | **CO1** |
| **3** | Outline the organizational structure of track maintenance teams and analyze the impact of signaling and speed restrictions on maintenance operations. | **10 Marks** | **L2** | **CO2** |
| **4** | In the event of a derailment that blocks a section of railway track and halts 20 trains, each carrying 1,200 passengers, calculate the total passenger-hours lost assuming an average delay of 6 hours per train. Discuss the implications of this for disaster management planning. | **10 Marks** | **L2** | **CO2** |
| **5** | Provide an overview of Japan’s Automatic Train Control (ATC) system, focusing on its implementation and effectiveness in preventing accidents. | **10 Marks** | **L2** | **CO2** |
| **6** | What measures have been adopted by Indian Railways to prevent collisions and derailments? Highlight specific technologies and strategies in use. | **10 Marks** | **L2** | **CO2** |

**Part B**

**Answer all the Questions. Each question carries 20 marks. 2Q x 20M=40Marks**

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| **7.** | Compare the recommendations of Indian railway safety committees with global safety practices. How applicable are these recommendations in the Indian context?  A train equipped with KAVACH safety technology operates at a speed of 160 km/h and maintains a safe braking distance of 1.5 km. Calculate the reaction time required to avoid a collision and evaluate the effectiveness of KAVACH in enhancing rail safety in India. | **20 Marks** | **L3** | **CO3** |
| **8.** | Provide a detailed case study of the Odisha train collision, analyzing its causes, rescue efforts, and key lessons learned.  A high-speed railway track requires 20 inspections annually, with each inspection costing ₹2,50,000. Calculate the total annual maintenance cost for a 200 km track and discuss cost-effective strategies to optimize maintenance while ensuring safety. | **20 Marks** | **L3** | **CO3** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***