Ph.D Entrance Test Syllabus

Thrust Area-Smart Mobility:

Project 1: Developing an implementable and sustainable MaaS Framework

Introduction to transportation modes – classification of roads - Traffic characteristics - Road user and vehicular characteristics - traffic studies and surveys – speed studies, volume studies, parking studies, accident studies – traffic signs and markings

Urban Transportation Planning – Travel Demand Modelling: Four stages – Trip generation, distribution, modal split, and trip assignment

MaaS architecture and ecosystem – Multimodal Transport integration – User preference surveys – Sustainable mobility frameworks – Digital mobility platforms & APIs – Transportation Data Analysis

Probability & statistics - Hypothesis testing - Regression, classification, clustering - Neural networks & deep learning basics - Generative models - Feature engineering & model evaluation metrics

Python programming - Databases & data handling - Cloud and edge computing - IoT communication protocols (MQTT, CoAP, HTTP) - Network fundamentals for intelligent mobility

Question paper pattern:

Short answer questions: 5 (5 X 3 = 15)

Long answer questions: 3 (3 X 15 = 45)

Total Marks: 60 Marks