



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF COMMERCE, HUMAN SCIENCES AND EDUCATION

DEPARTMENT OF MARKETING, LOGISTICS AND SPORT MANAGEMENT

QUALIFICATION: BACHELOR OF TRANSPORT MANAGEMENT	
QUALIFICATION CODE: 07BTRA	LEVEL: 6
COURSE: INTELLIGENT TRANSPORT SYSTEMS	COURSE CODE: ITT611S
SESSION: JULY 2024	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS
<ol style="list-style-type: none">1. Answer ALL questions from Sections A and B, and any three (3) questions from Section C2. Number your answers clearly.3. The number of marks per each question or part question is given in square brackets []. These should guide you in the content of your answers.4. This is a Closed Book Examination. No books or notes may be consulted during the exam.

THIS QUESTION PAPER CONSISTS OF 5 PAGES (Including this front page)

SECTION A: ANSWER ALL QUESTIONS

Question 1: State whether the following statements are TRUE OR FALSE

- 1.1 The transportation layer of an ITS architecture is inferior to the information and institutional layer [2 marks]
- 1.2 Good quality pre-trip information enables travellers to achieve, route optimization, cost maximisation and travel time minimisation. [2 marks]
- 1.3 Intelligent Transport Systems standards are consensus-based, voluntary and closed. [2 marks]
- 1.4 Electronic toll collection, congestion pricing, Integrated Vehicle Health Monitoring Systems and variable parking fees are all examples of Advanced Traffic Management Systems, (ATMS) [2 marks]
- 1.5 An Intelligent Transport System architecture encompass protocols, which define how data are to be exchanged among ITS elements, including such matters as addressing, security, and priority of messages. [2 marks]
- 1.6 I.T.S seek to address some problems brought about by the twin forces of urbanization and motorization. [2 marks]
- 1.7 Variable Messaging Signs, (VMS) displays include a downward pointing green arrow indicating that the lane is available or a red "X" indicating the lane is not available. [2 marks]
- 1.8 Intelligent Transport Systems are aimed at improving on safety, minimise on efficiency, environmental preservation and minimize cost. [2 marks]
- 1.9 A dead-reckoning system is used to provide back-up vehicle location information to a GPS system, when the GPS signal is unavailable [2 marks]
- 1.10 Integrated Vehicle Health Monitoring Systems, (IVHMS) facilitates collection and analysis of data concerning operating parameters and damage information of vehicles in static-time. [2 marks]

Sub Total 20 marks

SECTION B: ANSWER ALL QUESTIONS

Question 2: Select the correct answer, each correct answer carries 2 marks

2.1 The following staffing requirements are required for Advanced Traffic Management Systems, **except** [2 marks]

- A. System Technical Support Officer(s)
- B. Traffic Manager
- C. Traffic supervisor
- D. Traffic engineer
- E. All these are required

2.2 Which of these is **NOT** a goal of Advanced Traffic Management Systems, (A.T.M.S)? [2 marks]

- A. Maximise travel time
- B. Increase Productivity for Commercial Vehicles
- C. Increase Traveller Comfort and Convenience
- D. Improve Safety
- E. Increase Capacity and Operational Efficiency

2.3 Which of these is **NOT** a key consideration when selecting communication technologies for I.T.S? [2 marks]

- A. Physical outlook
- B. Response time
- C. Reliability
- D. Area's coverage
- E. Capacity level

2.4 Variable Messaging Signs assist travellers with the following decisions, **except** [2 marks]

- A. Vehicle choice
- B. Lane choice
- C. Route choice
- D. Departure time choice
- E. All these are correct

2.5 Select the **ODD** one out from the following key functionality aspects of an ITS system. [2 marks]

- A. Maintainability
- B. Scalability
- C. None of these is odd
- D. Interoperability
- E. Deductibility

2.6 Advanced Traveller Information Systems provides static and real-time information on the following, **except** [2 marks]

- A. Traffic conditions
- B. Tourist information
- C. Speed of vehicles
- D. Weather conditions
- E. All these are correct

2.7 Which of these **does NOT** form part of activities under the I.T.S institutional layer? [2 marks]

- A. Financing I.T.S
- B. Creating partnerships to guide ITS deployments.
- C. Developing national policy
- D. Developing local policy
- E. All these are correct

2.8 Data generated by automated passenger counters is utilized for the following, **except** [2 marks]

- A. Load planning
- B. Vehicle scheduling
- C. Crew scheduling
- D. Demand forecasting
- E. All these are utilised

2.9 Which of the following **does NOT** represent an advantage of Global Positioning Systems? [2 marks]

- A. Accurate monitoring of service delivery
- B. Provision of real time data
- C. Accurate object position
- D. Theft recovery
- E. All these are correct

2.10 The following are Travel Demand Management measures (TDM), **except** [2 marks]

- A. Signal timing optimization
- B. Tele-working
- C. Land use management
- D. Staggered working hours
- E. All the above are TDM measures

Sub total 20 marks

SECTION C: ANSWER ANY THREE (3) QUESTIONS, EACH QUESTION CARRIES 20 MARKS

Question 3

Explain the Intelligent Transportation System solutions that enable the functionality of the following Travel Demand Management, (TDM) measures in improving traffic flow conditions in a city

- i. Reversible lanes [6 marks]
- ii. High Occupancy Vehicle lane management [7 marks]
- iii. Carpooling [7 marks]

Question 4

Identify challenges affecting the efficiency and effectiveness of Intelligent Transport Systems in Commercial Vehicle Operations in developing countries such as Namibia. [20 marks]

Question 5

- a) Explain the goals of Advanced Traveler Information Systems (ATIS) [5 marks]
- b) Discuss how the following I.T.S platforms work in providing Advanced Traveller Information
 - i. Global Positioning Systems [5 marks]
 - ii. Best Route Analysis [5 marks]
 - iii. Car Display System (CDS) [5 marks]

Question 6

Identify any two (2) types of Advanced Public Transport Systems, (APTS) and explain on their pros and cons. [20 marks]

Question 7

Describe how the following traffic data collection methods work, including their weaknesses and strengths.

- i. Ultrasonic detectors [10 marks]
- ii. Video based technology [10 marks]

Sub total: 60 marks

TOTAL 100 MARKS

END OF QUESTION PAPER