編號： 279

國立成功大學 106 學年度碩士班招生考試試題

系　　所：交通管理科學系

考試科目：運輸學

考試日期：0214，節次：3

※ 考生請注意：本試題不可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. (20 %)名詞解釋

(a) Demand Responsive Transit Systems (DRTS)

(b) Dedicated short-range communications (DSRC)

(c) Seamless Transportation

(d) Vehicle Infrastructure Integration (VII)

(e) Transit Oriented Development

2. (10%) 請說明何謂永續運輸 (sustainable transportation)，並請說明永續運輸政策的意義。

3. (10%) 請說明飛航管制與其目的，並依飛航管制之範圍說明飛航管制之類型？

4. (10%) 何謂航運之異業垂直整合(certical integration)與同業水平合作(horizontal cooporation)之策略聯盟? 試分析兩者的差異與優缺點。

5. (10%) 運輸業之定價方法有那幾種？ 請舉例說明並比較其優缺點。

6. (10%) 國內目前智慧型運輸系統的發展，係以 2004 年版 ITS 綱要計畫所提出的智慧型運輸服務（Intelligent Transportation Services）為主，請說明智慧型運輸系統 ITS 的目的為何? 請說明國內智慧型運輸系統 ITS 的九大服務（或系統）的內容。

7. (15%) 假設一大眾捷運路線最多可允許 6 節車廂營運，每一車廂有 60 個座位，其中最小班距為 240 秒。假若在某一時段，路線上以 4 節車廂 360 秒班距在營運，其在最大運載區間 (Maximum Load Section, MLS)的總運載人數為 3600 人/小時，(a) 請計算路線最大容量 (C_{max})與排定路線容量; (b) 考慮大型活動的辦理，最大運載區間 (Maximum Load Section, MLS)的總運載人數達 7200 人/小時，請問如何調整班次來增加輸運能力，如果容量不足，應如何加以改善。

8. **(15%)** The U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) defined five levels of vehicle automation (2013), and these levels of automation include:

- No-Automation (Level 0): The driver is in complete and sole control of the primary vehicle controls – brake, steering, throttle, and motive power – at all times.
- Function-specific Automation (Level 1): Automation at this level involves one or more specific control functions. Examples include electronic stability control or pre-charged brakes, where the vehicle automatically assists with braking to enable the driver to regain control of the vehicle or stop faster than

possible by acting alone.

- Combined Function Automation (Level 2): This level involves automation of at least two primary control functions designed to work in unison to relieve the driver of control of those functions. An example of combined functions enabling a Level 2 system is adaptive cruise control in combination with lane centering.
- Limited Self-Driving Automation (Level 3): Vehicles at this level of automation enable the driver to cede full control of all safety-critical functions under certain traffic or environmental conditions and in those conditions to rely heavily on the vehicle to monitor for changes in those conditions requiring transition back to driver control. The driver is expected to be available for occasional control, but with sufficiently comfortable transition time. The Google car is an example of limited self-driving automation.
- Full Self-Driving Automation (Level 4): The vehicle is designed to perform all safety-critical driving functions and monitor roadway conditions for an entire trip. Such a design anticipates that the driver will provide destination or navigation input, but is not expected to be available for control at any time during the trip. This includes both occupied and unoccupied vehicles.

One important application might be shared autonomous vehicles (SAV). Self-driving/ Autonomous vehicles are promising safer, more comfortable, lower insurance cost and better fuel-efficiency car transport and are expected to solve the congestion issue in urban area. New technologies open possibility to enable new ride-sharing and car-sharing models and dramatically cut travel costs, being a crossover between car-sharing programs. Please outline a possible procedure to design a SAV system in Taiwan.