Questions for the written exam

1. Describe the main developments that took place over the centuries in the transport sector. What is the relationship between industrial and economic development and transport?
2. Describe the main approaches to modelling traffic. What do traffic engineers and transport economists focus on? Explain the fundamental diagram of traffic (Greenshields). Explain the difference between the user’s optimum and the system’s optimum equilibria? What is a congestion charge? Why is it needed and what does it achieve?
3. Which policies could be implemented to reduce congestion and pollution? Describe the main applications worldwide. Describe the Ecopass, Area C and Area B policies enacted in Milan (technology, boundaries, tariffs, exemptions, ..)? What were the components of the policy packages? What are the main results?
4. The car and the environment. How did the car develop as a mass product? Describe the current automotive sector. What are the main energy and environmental implications of the success of the car. What are the characteristics of the electric cars? What are their pros and cons? What new business models have been developed? What are the main ingredients for the penetration of the electric cars?
5. Illustrate road freight transport sector: technological features, pros and cons relative to other models, and the main agents (drivers, transport firms, forwarders, couriers, 3PTL). How satisfactory is the road transport service? What are the main INCOTERMS? What are the main issues according to the main actors? What policies are implemented?
6. Illustrate rail transport sector. Which are the main characteristics and its historical development? What are the strong and weak points of the rail transport? In which countries is it mostly used and what are the main business models? What are the main features and business strategies of the largest Italian railway company (Ferrovia dello Stato)? What the policies and the obstacles for an open European rail market?
7. Maritime transportation. Discuss the recent trends in transport volume and ship size. What are the main market segments? Illustrate the major routes and type of services offered. What is a hub&spoke system? What are the pros\cons of containerization? Why is maritime transport so successful? What are the main issues connected with the business cycles?
8. Ports. Describe the three stages of development of a port (emporium, industrial, gateway) and their main characteristics. What are the ingredients for the success of a port? Discuss them in detail. What are the main port administration models? Please describe them and underline their pros and cons.
9. Air transport. How did air transport develop from a technological and economic viewpoint? What are the main differences between a legacy and a low cost carrier in terms of business models and from the point of view of the customer?
10. What is revenue management? Explain the Littlewood’s rule. How are the protection levels determined? What are the bid prices? What is the overbooking?