**CE 2710 Quiz 2 Study Guide**

**Fall 2019**

**Transportation Forecasting**

**Overview**

1. What is the 4-step process and what is it used for?
2. What are the steps and the purpose of each of the 4 steps?

**Trip Generation**

1. What is the purpose of trip generation?
2. Know the format of the cross-classification TG model
3. Know in very general terms the procedure used to get a TG model?
4. Know what land use and socio-economic factors are generally considered?
5. Know why is it necessary to consider land use and socio-economic factors?
6. Know how to use the cross-classification TG model to calculate number of trips from a TAZ
7. Understand the potential sources of error in the TG process

**Trip Distribution**

1. What is it?
2. Describe gravity model - the parameters and the meaning of the parameters
3. Know how to use gravity model to get trip interchange
4. Know the limitations of the gravity model

**Modal Split**

1. What is it?
2. What is a utility function?
3. Know the parameters typically used in the utility function
4. Know how factors such as comfort and image are considered in the model
5. Know how to use the utility function and logit model to get modal split

**Trip Assignment**

1. What is it?
2. Know how the network is represented?
3. Know how to interpret network graph and link array
4. Know what a tree diagram is
5. Know how to determine tree diagram from network graph or link array
6. Know how to interpret a tree table
7. Know the meaning of the term ‘all-or-nothing’ assignment
8. Know how to use tree diagram and 'all-or-nothing' assignment to assign trips to links

**Traffic Flow**

1. Know and understand the relationship between i) spacing and concentration, ii) headway and flow
2. Know the definition and equations for determining time-mean-speed and space-mean-speed
3. Know where to use TMS versus SMS
4. Know how to construct and use the time-distance diagram to get spacing, headway, flow, concentration and speed
5. Understand how vehicle spacing changes with speed
6. Know the relationships between flow, speed and concentration
7. Know the general shape of the speed-concentration, speed-flow and flow-concentration diagrams
8. Understand why slower speeds might result in higher flow
9. Understand the concept of a shock wave – how it forms and under what condition
10. Know the procedure and formulas to analyze the propagation or dissipation of shock waves

**Formulae Given on Exam**

* **Gravity Model**
* **Utility Function**
* **Multinomial Logit Model**
* **Time until queue or platoon dissipate**

**T = t usw2 / (usw2 - usw1 )**