



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of  
Civil Engineering

**FINAL EXAMINATION**  
**SEMESTER I, SESSION 2017/2018**

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COURSE CODE : SKAA 4843  
COURSE : TRANSPORT PLANNING  
PROGRAMME : SKAW  
DURATION : 2 HOURS 30 MINUTES  
DATE : JANUARY 2018

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**INSTRUCTION TO CANDIDATES:**

1. ANSWER ANY FOUR (4) QUESTIONS
2. USE SEPARATE ANSWER BOOK FOR SECTION A, B AND C
3. REFERENCES ARE NOT ALLOWED.

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**WARNING!**

*Students caught copying/cheating during the examination will be liable for disciplinary actions and the faculty may recommend the student to be expelled from the study.*

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This examination question consists of (7) printed pages only.



**SECTION A:**

Use separate answer book for this section.

- Q1. (a) There are several studies involved in Transportation Planning Process such as O-D, volume, speed, parking, travel time, etc. Select three (3) studies of your choice, discuss each in detail (not limited to) what the study is all about, its applications, and how the study is conducted.

*(15 marks)*

- (b) Elaborate/discuss this statement: "The interdependence of land-use and transport is the key-note of modern transport planning".

*(10 marks)*

*(25 marks)*

- Q2. (a) "Waze" is one of the mobile applications that can be considered as intelligent transport system (ITS).

What is ITS and why is it important?

Five primary functional areas of ITS are:

- i. Advanced Traffic Management Systems (ATMS);
- ii. Advanced Traveler Information Systems (ATIS);
- iii. Commercial Vehicle Operations (CVO);
- iv. Advanced Public Transportation Systems (APTS); and
- v. Advanced Vehicle Control Systems (AVCS).

Briefly explain those five functional areas and give example/examples of the ITS application for each of them.

*(15 marks)*

- (b) Transportation is responsible for the development of civilizations, changed the way people live and travel. The importance/role of transportation in modern society can be categorised into economics, social, political and environmental. Briefly discuss these four roles of transportation in the society.

*(10 marks)*

*(25 marks)*



**SECTION B:**

Use separate answer book for this section.

- Q3. A market segment consists of 3,000 individuals. A Multinomial Logit Model is calibrated for this market segment, resulting in the following utility function:

$$U_K = a_K - 0.04X_1 - 0.10X_2 - 0.03X_3$$

Where

- $U_K$  = utility of mode  $K$   
 $a_K$  = calibrated mode-specific constant for mode  $K$   
 $X_1$  = travel time, in min  
 $X_2$  = terminal time, in min  
 $X_3$  = travel cost, in RM

The traffic zone has the following characteristics:

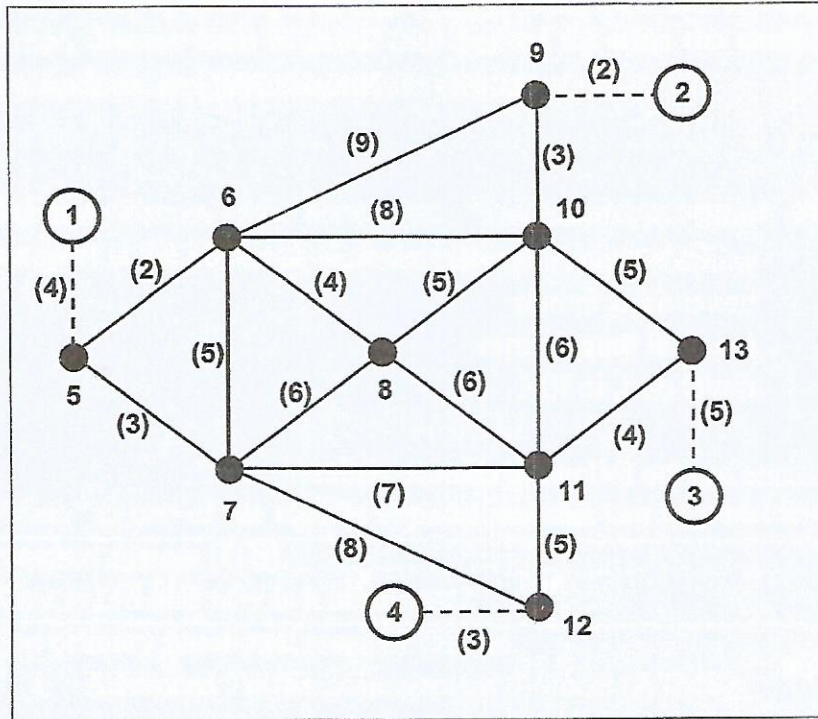
	$a_K$	$X_1$	$X_2$	$X_3$
Automobile	-0.30	25	0	2.70
Bus	-0.35	45	10	1.20
Light Rail	-0.40	30	15	1.90

Based on the given data, calculate:

- (i) The modal split for each mode; and
- (ii) The modal split if a parking fee of RM 2.00 per trip is imposed.

(25 marks)

Q4. The coded network shown in **Figure Q4** consists of a number of zone centroids. Build a minimum path tree and final tree table from zone centroid 1. The values in parenthesis are travel time in minutes.



**FIGURE Q4**

*(25 marks)*



**SECTION C:**

Use separate answer book for this section.

Q5. (a) Why Traffic Impact Assessment study is needed?

(5 marks)

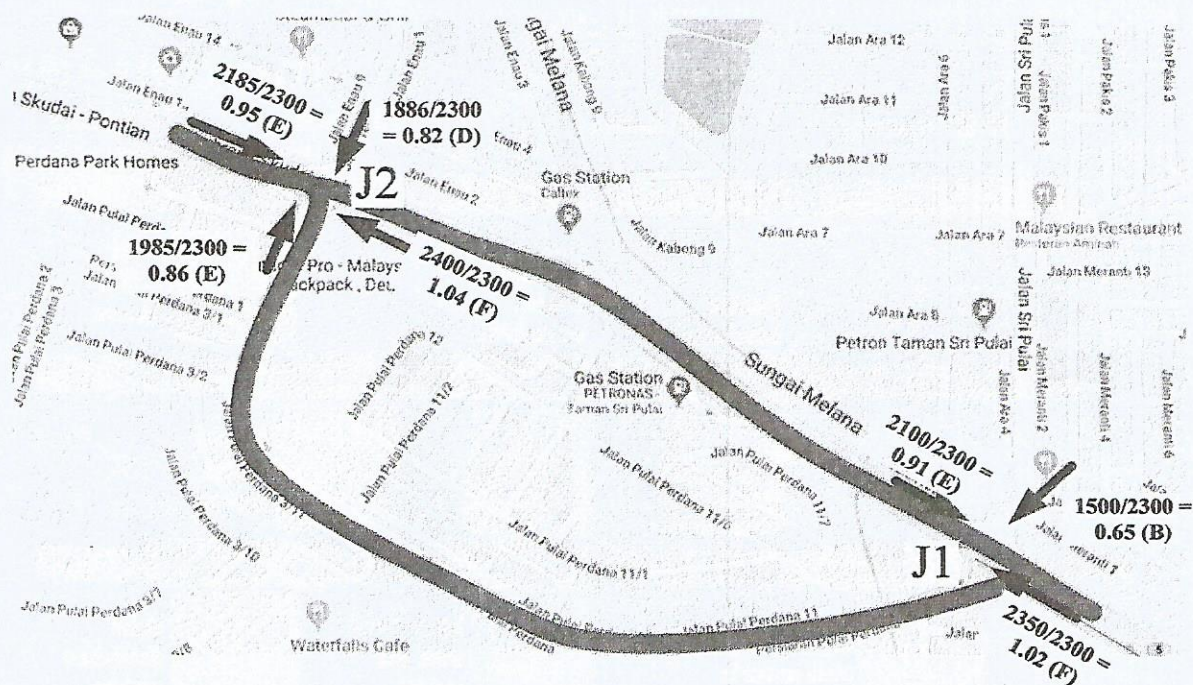
(b) Briefly explain three (3) elements in Traffic Impact Assessment and discuss the Analysis of Future Condition for new development area.

(12 marks)

(c) Figure Q5(c) shows the performance of volume-capacity analysis at existing dual carriageway road at two (2) junctions. These junctions are affected by surrounding residential development. From this scenario discuss the trip generation and trip distribution that affect the junctions?

(8 marks)

(25 marks)



**FIGURE Q5(c) : Volume/Capacity analysis on existing road**



## EQUATIONS

The symbols indicate parameters usually used.

$$p(k) = e^u_k / \sum e^u_x$$

$$P(A) = \frac{\exp(U_A)}{\exp(U_T) + \exp(U_A)}$$

$$P(T) = \frac{\exp(U_T)}{\exp(U_T) + \exp(U_A)}$$

$$P(B|T) = \frac{\exp(U_B)}{\exp(U_B) + \exp(U_R)}$$

$$P(R|T) = \frac{\exp(U_R)}{\exp(U_B) + \exp(U_R)}$$

$$P(B) = P(B|T) \times P(T)$$

$$P(R) = P(R|T) \times P(T)$$