UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2020/2021

COURSE NAME	:	ADVANCED TRAFFIC ENGINEERING AND SAFETY
COURSE CODE	:	MFH10103
PROGRAMME CODE	:	MFA
EXAMINATION DATE	:	JULY 2021
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS **CLOSE BOOK EXAMINATION**

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 (a) In your home country, under which traffic condition will you be able to use Greenshield models but not the Greenberg model? Provide the reason for your answer.

(6 marks)

(b) On a race track, two cars are moving for two hours. Their distance travelled relation is as follows:

$$d = 60t \text{ and } d = 60t^2$$

Estimate the maximum space headway

(4 marks)

(b) A CCTV captured a photograph of four vehicles travelling on two lane highway segment (between section A and B) with constant speed. The position and the speed of each vehicle is illustrated in the **Figure Q1(b)**. Calculate the flow, density, time mean speed and space mean speed of the traffic.

(15 marks)

Q2 (a) Write an operational anaysis of procedure report to determine the Level of Service at Signalised Intersection

(15 marks)

(b) As an engineer, you are responsible to design a new urban freeway. Due to safety factor, the freeway must be designed with rolling terrain and to be able to accommodate at least 75000 veh/day of AADT. Consider LOS D as the lowest performance during peak hour, determine the minimum number of lanes need to be included in the design. Compute the speed and density of traffic for the proposed number of lanes.

Additional information of the freeway are given as follow:

Proportion of daily traffic occurring during the peak hour = 0.090
Proportion of peak hour traffic travelling in the peak direction of flow = 0.55
Free flow speed = 110 km/h
PHF = 0.90
0 percent RVs
Assume traffic commuter

(10 marks)

Q3 (a) Consider Universiti Tun Hussein Onn Malaysia (UTHM) intersection as one of the highest accident risk locations in Parit Raja. Suggest **THREE (3)** reasons wether or no, road channelisation can improve the accident risk at this location

(6 marks)

(b) In your opinion, is diamond interchange suitable to replace UTHM intersection? Suggest the factors should be considered in diamond interchange selection.

(5 marks)

(c) Write a a simple proposal to the Batu Pahat local goverment, the new potential road geometric design to improve traffic flow and safety at UTHM intersection.

(14 marks)

Q4 (a) Define 'road accident' in your own words.

(3 marks)

(b) By the year 2030, Malaysia is benchmarking against the world's best to reduce the fatality rate to 2.0 deaths per 10,000 vehicles instead of 3.0 deaths per 10,000 vehicles that was initially targeted. Determine, **FIVE (5)** potential strategies to bring down the road fatality rate to 2.0 deaths per 10,000 vehicles by the year 2030?

(10 marks)

(c) The pedestrian and motorcyclist are the groups of road users which can be categorized as the Vulnerable Road User, which possess high risk of fatalities in road accident. Determine **FOUR (4)** safety programs that can be conducted to reduce the risk of fatal accident that involve them.

(12 marks)

– END OF QUESTIONS –

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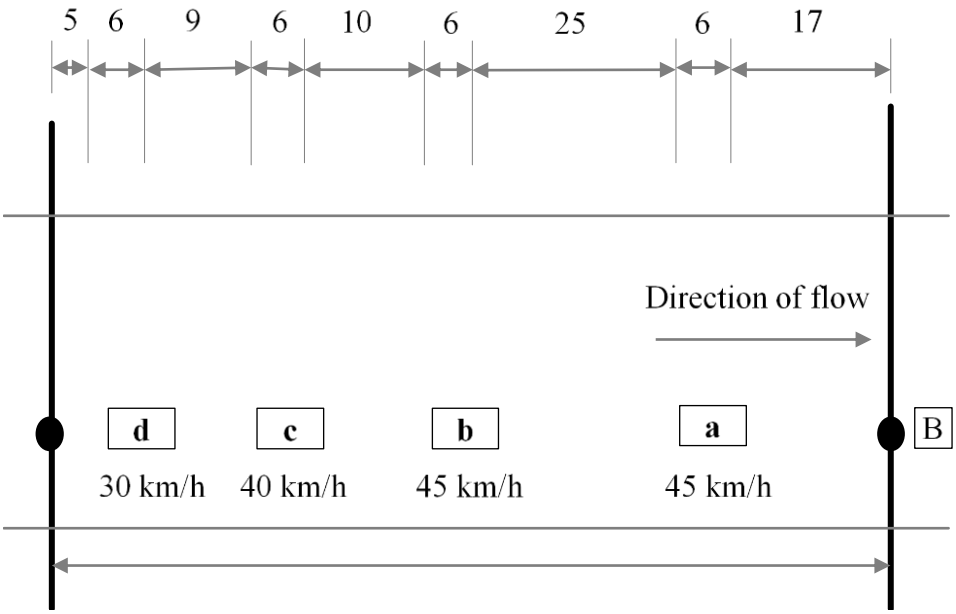

Figure Q1(b): Position and speed of vehicle