Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER 1
SESSION 2021/2022

COURSE NAME	:	ADVANCED TRAFFIC ENGINEERING AND SAFETY
COURSE CODE	:	MFH 10103
PROGRAMME	:	MFA
EXAMINATION DATE	:	JANUARY / FEBRUARY 2022
DURATION	:	3 HOURS
INSTRUCTIONS	:	1. ANSWER **ALL QUESTIONS** 2. THIS FINAL EXAMINATION IS AN **ONLINE** ASSESSMENT AND CONDUCTED VIA **CLOSE BOOK**

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

Q1 Draw the traffic conflict diagram at the following junctions and differentiate between the major and minor conflicts.

(a) T-junction

(9 marks)

(b) Cross junction

(12 marks)

(c) Based on the conflict diagram analysis in Q1(a) and Q1(b), justify why a cross junction is always best to signalised from viewpoint of road safety at traffic junction regardless of the traffic volume (briefly explain **TWO (2)** reasons).

(4 marks)

Q2 A east-west single carriageway 1-lane highway (1X1) with 2000 vph of traffic on it merged with another north-south single carriageway 1- lane highway with 1800 vph of traffic.

(a) Sketch an at-grade junction merging condition with aid of a diagram such that the output of the merging road is a north-south dual carriageway 2-lane highway with 50:50 traffic splits, i.e. LT to north and RT to south from east, LT to east and Thru to north from south, and RT to east and Thru to south from north. Distribute the traffic volume at the new junction with new generated traffic of 1000 vph.

(12 marks)

(b) Draw a grade separated junction merging condition with aid of a diagram such that the output of the merging road is a north-south dual carriageway 2- lane highway.

(13 marks)

Q3 A traffic consultant had conducted a morning peak hour classified traffic counting survey for a collector road on Wednesday of a week in 2019 and the result was presented in the following **Table Q3**.

(a) Calculate the total 15 minutes peak hour traffic and plot a bar chart for the whole peak hour duration (7:00 to 10:00).

(7 marks)

(b) Determine the DHV and Peak hour factor, i.e. K-factor of the traffic volume.

(8 marks)

(c) Evaluate the traffic composition of the DHV and determine its pcu/h using the following pcu equivalent factor in **Table Q3 (a).**

(10 marks)

Q4 A residential street is becoming a traffic accident prone area with the occurrence of traffic accidents involving not only vehicles but also pedestrians and cyclist. Since the community is against installation of speed hump, propose **FIVE (5)** possible traffic accident counter measures which will reduce and eventually erase traffic accidents for the street. Briefly describe each proposal.

(25 marks)

-END OF QUESTIONS-

Table Q3: The AM peak hour traffic survey data

	Vehicle Class					
Duration	Car	M. Lorry	H. Lorry	Bus	Motorcycle	Total
7:00 -7:15	100	10	5	2	70	
7:15 - 7:30	111	11	6	3	81	
7:30- 7:45	151	12	7	3	91	
7:45 - 8:00	161	13	8	3	101	
8:00 - 8:15	171	14	9	3	111	
8:15 - 8:30	160	14	9	3	110	
8:30 - 8:45	150	13	8	3	100	
8:45 - 9:00	140	12	7	2	90	
9:00 - 9:15	130	11	6	2	80	
9:15- 9:30	120	10	5	2	75	
9:30 - 9:45	110	9	4	2	70	
9:45 - 10:00	100	8	4	1	65	

Table Q3 (a): pcu equivalent factor as per JKR standard

Car	M lorry	H Lorry	Bus	Motorcycle
1.00	1.19	2.27	2.08	0.22