

SULIT



Second Semester Examination
2020/2021 Academic Session

July/August 2021

EAL338 – Transportation and Road Safety

Duration : 2 hours

Please ensure that this examination paper contains **SIX (6)** printed pages before you begin the examination.

Instructions: This paper contains **TWO (2)** questions. Answer **ALL** questions.

All questions **MUST BE** answered on a new page.

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1. (a). The road location study and selection process are one of the most important parts of highway design. Therefore, study of the selected route location and preliminary survey are very critical before the road construction. **Figure 1** presents roads that will be constructed connecting different parts of the island. The first road connects **A** and **B**, while the second road connects **B** and **C**.

i) Based on the selected road alignment (green dotted line), sketch the ground profile and identify the water flow directions along the road.

[10 marks]

ii) Sketch and name **FIVE (5)** necessary traffic signs to be placed on site based on the selected road alignment in a(i).

[5 marks]

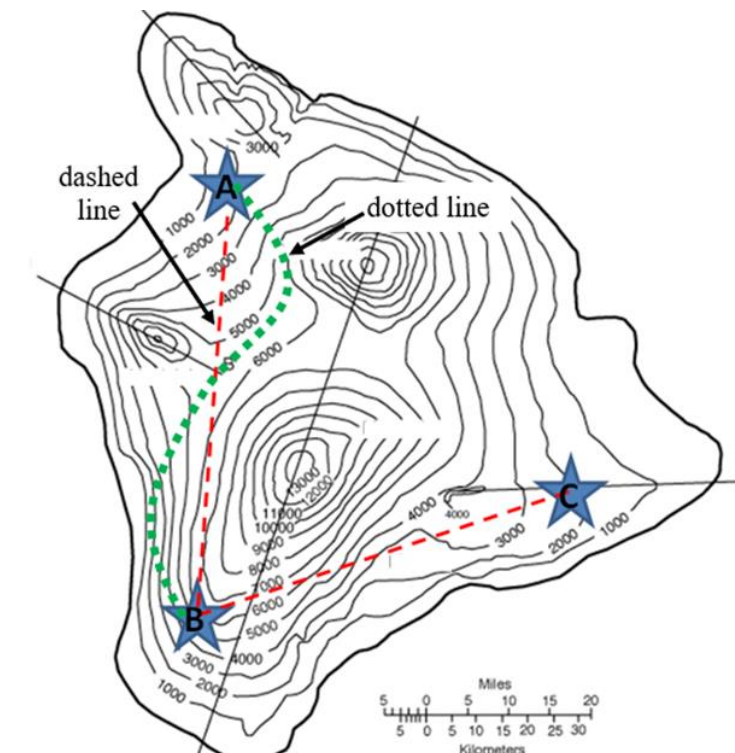


Figure 1

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(b)

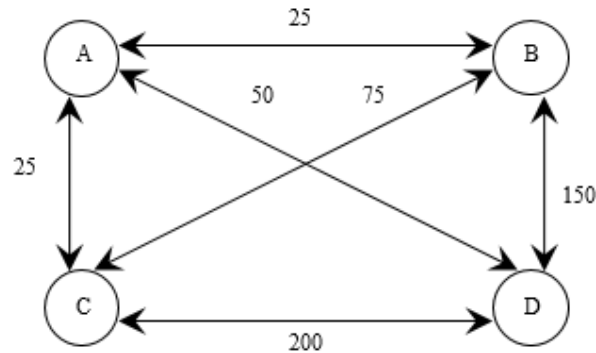


Figure 2 Trip distribution for Zone A, Zone B, Zone C and Zone D in 2021

Table 1 Trip generation and growth factor for four zones in 2021

Variables	Zone			
	A	B	C	D
Total trip production from Zone <i>i</i> in 2021	100	250	400	300
Growth factors	2.0	3.0	2.0	1.0

Figure 2 above shows the current trip distribution for four zones, Zone A, Zone B, Zone C and Zone D. **Table 1** shows the current trip production and growth factors for all zones. From trip generation analysis, it is found that the trip attraction and trip production are similar for each zone. Based on the data given above

- i) Build a matrix to determine the trip distributions for each zone.

[10 marks]

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ii) Estimate the future trip distribution for each zone by using UNIFORM GROWTH FACTOR method.

[20 marks]

iii) Conclude your calculation from the trip distribution analysis by using a suitable diagram.

[10 marks]

(c). The objective of trip generation model is to forecast the number of trips generated in travel-analysis zone based on the target year. The trips predicted by trip generation model are referred to the trip ends associated with the zone. Trip – ends are classified as either origins-destinations (OD) or production-attraction (PA). With the aid of suitable diagrams, explain the definition of trip-ends for origin – destination (OD) and production – attraction (PA).

[10 marks]

2 (a) **Table 2** and **Table 3** show the road fatalities and road accidents statistic respectively for Malaysian states between the year 2007 and 2019.

Table 2 Road fatalities on Malaysian Roads (Source: PDRM)

States	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Perlis	41	69	90	66	79	71	72	61	65	67	62	64	76
Kedah	492	496	550	532	515	548	517	525	530	572	560	509	446
P/Pinang	376	354	395	370	811	400	381	378	360	411	401	390	392
Perak	811	829	829	820	392	753	770	750	726	789	711	693	667
Selangor	1,025	1,083	976	1,061	1070	1,102	1,019	1,068	1,028	1,140	1,087	1046	1054
K/Lumpur	234	237	230	233	236	249	243	238	256	232	236	229	209
N/Sembilan	320	389	377	399	374	352	396	379	355	414	370	362	337
Melaka	227	243	248	235	240	243	258	236	256	247	230	191	217
Johor	1,023	1,065	1,060	1,076	1073	1,073	1,128	1,018	1,040	1,135	1,067	977	1040
Pahang	437	446	512	574	563	540	592	539	532	539	485	485	454
Kelantan	374	380	453	380	392	392	378	354	426	453	442	420	338
Terengganu	290	293	348	314	292	301	320	276	307	342	330	275	277
Sabah	316	325	345	447	398	450	420	420	392	379	351	310	291
Sarawak	316	318	332	365	442	443	421	432	433	432	408	333	369
Total	6,282	6,527	6,745	6,872	6877	6,917	6,915	6,674	6,706	7,152	6,740	6284	6167

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Table 3: Road Accidents on Malaysian Roads (Source: PDRM)

States	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Perlis	1,364	1,417	1,633	1,548	1,791	1,881	1,895	1,888	1,861	2062	1925	2093	2098
Kedah	16,172	16,520	17,701	17,966	19,699	19,935	20,228	20,159	22,016	23200	23262	23239	24867
Pulau Pinang	33,881	34,049	33719	34,306	37,158	37,851	39,408	38,747	39,856	42244	43007	45734	47198
Perak	29,203	30,539	32,327	32,072	33,506	34,714	39,361	35,131	36,736	38531	38587	38278	39720
Selangor	99,157	100,380	107,429	115,565	128,876	129,106	135,024	137,809	140,957	151253	154958	163078	168222
Kuala Lumpur	49,454	48,671	51,942	53,493	58,795	61,872	64,527	63,535	64,664	68866	72940	72284	73771
Negeri Sembilan	16,079	17,362	18,369	19,407	21,157	22,146	23,066	23,748	22,939	24428	24941	25123	25838
Melaka	11,720	12,105	13,275	14,110	14,720	15,195	16,083	16,375	17,069	18601	18771	19120	19593
Johor	46,584	48,667	51,747	55,381	59,501	62,316	64,600	64,473	67,112	73116	76121	78812	82502
Pahang	13,982	15,629	17,068	17,315	19,001	20,554	20,130	19,071	19,635	20465	20813	20641	21196
Kelantan	8,116	8,842	9,549	10,106	10,684	10,861	9,748	10,326	9,960	10793	10713	10983	11295
Terengganu	8,155	8,814	10,118	9,707	9,603	9,968	10,996	9,383	10,381	10544	10786	10607	11355
Sabah	14,256	14,588	15,798	16,192	16,585	17,446	18,700	17,693	17,290	17298	17244	18006	18520
Sarawak	15,196	15,488	16,655	17,253	17,964	18,578	17,438	17,858	19,130	20065	19807	20600	21341
Total	363,319	373,071	397,330	414,421	449,040	462,423	481,204	476,196	489,606	521,466	533,875	548598	567516

Select the state in which you were born (or where you are staying now if you were not born in Malaysia). Please mention clearly the name of the state.

The Decade of Action for Road Safety 2011-2020 had hoped that road safety performance will improve over the decade. There are many ways to indicate if you have actually made progress. You are to use the year 2010 as your base line, and the year 2019 as the year to measure progress.

- i) Describe how your state has performed based on the numbers of fatalities over this period.

[2 marks]

- ii) Describe how your state has performed based on the number of accidents over this period.

[2 marks]

- iii) Calculate an index of "fatality/accident", and describe how your state has performed in 2019 compared to 2010, and show the rank of your state compared to the other states in Malaysia.

[7 marks]

- iv) State **TWO (2)** conclusions that you can make from the three analyses that you have made above.

[4 marks]

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- (b) i) There are several definitions of sustainable transport. Provide one definition, and explain what the definition aspires to achieve.
[3 marks]
- ii) Describe the challenges that will be faced in achieving sustainable transport.
[5 marks]
- iii) Describe how a good public transport system can help to achieve sustainable transport.
[5 marks]
- iv) If you have the capacity to make decision for road safety in Malaysia:
- a) select one issue in road safety that you want to solve first.
[1 mark]
- b) state why you have chosen the particular issue by describing how it will help Malaysia achieve her road safety goals, and the goals of the appropriate Sustainable Development Goals.
[6 marks]

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