UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018

COURSE NAME	:	ROAD SAFETY ENGINEERING
COURSE CODE	:	BFT40603
PROGRAMME CODE	:	BFF
EXAMINATION DATE	:	JUNE 2018 / JULY 2018
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

TERBUKA

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1   (a)   Discuss the possible error generally made by drivers that might lead to road accident.

                   (6 marks)

    (b)   Road Safety Plan of Malaysia 2014-2020 has been formulated in collaboration with Road Transport Department (RTD), Royal Malaysia Police (RMP), Ministry of Health (MOH), Public Works Department (PWD) and other road safety related government agencies as well as private sector entities and Non-Governmental Organizations (NGO). The approach in the formulation of Road Safety Plan of Malaysia 2014-2020 and its implementation is guided by the Global Decade of Action which emphasised the need for road safety programmes to be outcome based. Road Safety Plan of Malaysia 2014-2020 will emphasise on outcomes and interventions. Please state all **FOUR (4)** formulations of Road Safety Plan of Malaysia 2014-2020.

                   (4 marks)

    (c)   List and briefly explain all **FIVE (5)** strategic pillars in Road Safety Plan Malaysia 2014-2020.

                   (15 marks)

Q2   (a)   Briefly explain **THREE (3)** main factors that contribute to road accident.

                   (3 marks)

    (b)   Based on the **TABLE Q2(b)** data, compute all relevant population-based accident and fatality rate for this 5 years back data. Compare them with national norms for the current year based on Severity Index.

                   (15 marks)

    (c)   Describe blackspot area according to Highway Planning Unit.

                   (4 marks)

    (d)   Highway Planning Unit defines the blackspot areas by rating them, please explain.

                   (3 marks)

Q3 Road Safety Audit (RSA) is described in Road Safety Plan Malaysia 2014-2020 under the 2nd Strategy Pillar. It is a relatively new road engineering technique aimed at identifying potential safety problems during the planning and designing of projects. If applied to existing roads, RSA can identify potential safety hazards along roads before they become accident prone locations. RSA would cover all roads in the country.

(i) Please list the **STAGES** in Road Safety Audit that have been practised in Malaysia.

(5 marks)

(ii) As a developing country, Malaysia is still upgrading the level of transportation especially road network. To achieve that Malaysia will keep on upgrading and constructing a new road as needed. As a traffic engineer what you should do if the alignment roads that you will construct are mixed with new and upgrading existing roads? Describe the RSA stages required in your construction and briefly explain each of stages stated.

(20 marks)

Q4 (a) As a Traffic engineer dealing with Road Safety Engineering, you need to have various Evaluation Techniques. Please indicate **WHY** you need these Evaluation Techniques for Road Safety Engineering.

(3 marks)

(b) List **THREE (3)** types of economic assessment in Evaluation Technique for Road Safety Engineering.

(3 marks)

(c) The site visit is a very important element of any accident investigation. Explain the main purpose of preliminary visit.

(2 marks)

(d) Environmental factor is one of the main contributing factors of road accident occurrence and typically being catered by a Civil Engineer. Explain **THREE (3)** elements in environment factor.

(6 marks)

(e) Illustrate the step by step process in the production of accident database system in Malaysia.

(9 marks)

(f) Briefly explain the meanings and functions of **TIA** and **TMP**.

(2 marks)

– END OF QUESTIONS –

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TABLE Q2(b)

Year	Registered Vehicles	Population	Road Crashes	Road Deaths	Serious Injury	Slight Injury
1997	8550469	21665600	215632	6302	14105	36167
1998	9141357	22179500	211037	5740	12068	37896
1999	9929951	22711900	223166	5794	10366	36777
2000	10598804	23263600	250429	6035	9790	34375
2001	11302545	23795300	265175	5849	8680	35944
2002	12068144	24526500	279711	5891	8425	35236
2003	12819248	25048300	298653	6286	9040	37415
2004	13828889	25580000	326815	6228	9218	38645
2005	15026660	26130000	328264	6200	9395	31417
2006	15790732	26640000	341252	6287	9253	19885
2007	16813943	27170000	363319	6282	9273	18444
2008	17971907	27730000	373071	6527	8868	16879
2009	19016782	28310000	397330	6745	8849	15823
2010	20188565	28910000	414421	6872	7781	13616
2011	21401269	29000000	449040	6877	6328	12365
2012	22702221	29300000	462423	6917	5868	11654
2013	23819256	29947600	477204	6915	4597	8388
2014	25101192	30300000	476196	6674	4432	8598
2015	26301952	31190000	489606	6706	4120	7432
2016	27613120	31,660,000[e]	521466[a]	7152[a]	NA	NA

e = estimated value from Department of Statistics Malaysia
a = media statement
NA = Not available (The official figures are not available yet)
VKT=Vehicle Kilometre TRAVELLED

Population – based rates:

Fatalities,accidents,or involvements per 100,000 area population
Fatalities,accidents,or involvements per 10,000 registered vehicles
Fatalities,accidents,or involvements per 10,000 licensed drivers
Fatalities,accidents,or involvements per 1,000 miles of highway

Exposure – based rates are stated accordingly to:
Fatalities,accidents,or involvements per 100,000,000 vehicle-miles traveled
Fatalities,accidents,or involvements per 10,000,00 vehicle-hour traveled
Fatalities,accidents,or involvements per 1,000,00 entering vehicle (for intersection only)

Severity Index, SI = Fatalities / total no.accidents (deaths per accident)

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Formulas:

First Year Rate Return (FYRR):

$$FYRR(\%) = \frac{Benefit\,(1\,year)}{Capital\,Cost} \times 100\%$$

Net Present Value (NPV)

$$NPV = PVB - PVC$$

- PVB is Present Value of Benefit
- PVC is Present Value of cost

$$NPV = \sum_{t=1}^{t=n} \frac{\left(Benefit - Cost\right)}{\left(1+r\right)^n}$$

Benefit – Cost Ratio (BCR)

$$BCR = \frac{\sum_{t=1}^{t=n} \frac{\left(Benefit\right)}{\left(1+r\right)^n}}{\sum_{t=1}^{t=n} \frac{\left(Cost\right)}{\left(1+r\right)^n}}$$

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