UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2011/2012

COURSE NAME	:	ADVANCED TRAFFIC ENGINEERING
COURSE CODE	:	BFT 4053 / BFT 40503
PROGRAMME	:	4BFF
EXAMINATION DATE	:	JUNE 2012
DURATION	:	2 HOUR 30 MINUTES
INSTRUCTION	:	ANSWER **FOUR (4)** QUESTIONS

THIS QUESTION PAPER CONSIST OF **EIGHT (8)** PAGES

Q1 (a) Differentiate the use of fixed time signal and actuated signal to control traffic flow at intersection

(6 marks)

(b) Explain **FIVE (5)** reasons why intersection channelisation is important.

(10 marks)

(c) With appropriate example, explain types of intersection control as listed below

(i) Passive control

(ii) Semi control

(iii) Active control

(9 marks)

Q2 (a) Differentiate between interrupted and interrupted flow and give example where those situation can be found

(7 marks)

(b) The data shown in **Table 1** were obtained by time-lapse photography on a highway. Use regression analysis to fit these data to the Greenshield models

Table 1 : Speed and density from time-lapse photography

Speed (km/h)	Density (veh/m)
28.4	85
48.2	70
60.6	55
80.2	41
101.2	20
110	15

(10 marks)

(c) Based on question Q2 **(b)** analyse:

(i) Mean free speed

(ii) Jam density

(iii) Capacity

(iv) Speed at maximum flow

(8 marks)

Q3 (a) List and explain **FOUR (4)** types of shock wave

(8 marks)

(b) The Southbound approach of a signalized intersection carriers a flow of 1000 veh/h/ln at a velocity of 50 km/h. The duration of the red signal indication for this approach is 15 sec. If the saturation flow is 2000 veh/h/ln with a density of 75 veh/ln, the jam density is 150 veh/km, calculate the following:

(i) The length of the queue at the end of the red phase

(ii) The maximum queue length

(iii) The time it takes for the queue to dissipate after the end of the red indication

(17 marks)

Q4 (a) Based on Figure **Q4** in Appendix, label A, B, C, D, E, F and G

(7 marks)

(b) Identify **FOUR (4)** criteria to be considered before proposing a roundabout

(4 marks)

(c) Differentiate **FOUR (4)** types of roundabouts

(14 marks)

Q5 (a) Differentiate between Freeway, Arterial, Collector and Local road

(8 marks)

(b) Explain **FOUR (4)** methods of traffic calming at junction

(8 marks)

(c) Consider your house close to heavy traffic road. A past year record shown that most of accident occurred in your areas is related to speeding. In your opinion can traffic calming reduce the problem? Give **THREE (3)** reasons.

(9 marks)

S1 (a) Bezakan diantara penggunaan isyarat masa tetap dan isyarat berubah bagi mengawal aliran lalulintas di persimpangan

(6 markah)

(b) Terangkan **LIMA (5)** sebab mengapa penyaluran *(channelisation)* persimpangan adalah penting.

(10 markah)

(c) Dengan contoh yang bersesuaian, terangkan jenis pengawalan persimpangan berikut

(i) Kawalan pasif

(ii) Kawalam separa

(iii) Kawalan aktif

(9 markah)

S2 (a) Bezakan diantara aliran terganggu dan aliran tak terganggu dan berikan contoh dimanakah situasi tersebut berlaku

(7 markah)

(b) Data yang ditunjukkan dibawah diperolehi melalui foto *'time-lapse'* diatas lebuhraya. Dengan menggunakan analisis *'regression'* sesuaikan data tersebut kepada model *'Grienshields'*.

Jadual S2 : Laju dan ketumpatan dari gambar selang masa

Laju (km/h)	Ketumpatan (kend/m)
28.4	85
48.2	70
60.6	55
80.2	41
101.2	20
110	15

(10 markah)

(c) Berdasarkan soalan S2 **(b)** analisis

(i) Purata laju bebas

(ii) Ketumpatan sesak

(iii) Kapasiti

(iv) Laju ketika aliran maksimum

(8 markah)

S3 (a) Senaraikan dan terangkan **EMPAT (4)** jenis *'shockwave'*

(8 markah)

(b) Pergerakan lalulintas kearah persimpangan berlampu isyarat dari arah selatan membawa aliran lalulintas sebanyak 1000kend/j/lorong pada kelajuan 50km/j. Masa isyarat merah pada arah pergerakan lalulintas tersebut adalah 15 saat. Sekiranya aliran tepu adalah 2000 kend/j/lorong, densiti 75 kend/lorong dan densiti sesak ialah 150 kend/km, kirakan:

(i) Panjang 'queue' ketika penghujung masa isyarat merah.

(ii) Panjang maksima '*queue*'

(iii) Masa yang diambil untuk membubarkan '*queue*' selepas masa isyarat merah tamat

(17 markah)

S4 (a) Berdasarkan Rajah **Q4** di dalam lampiran, labelkan A, B, C, D, E, F and G.

(7 markah)

(b) Kenal pasti **EMPAT (4)** kriteria yang perlu diberi diambil kira sebelum membuat cadangan pembinaan bulatan

(4 markah)

(c) Bezakan **EMPAT (4)** jenis bulatan

(14 markah)

S5 (a) Bezakan diantara jalan '*Freeway*', jalan *'Arterial'*, jalan pengumpul and jalan tempatan

(8 markah)

(b) Terangkan **EMPAT (4)** kaedah *'traffic calming'* untuk persimpangan

(8 markah)

(c) Andaikan kediaman anda berhampiran dengan jalan sesak. Rekod beberapa tahun yang lepas menunjukkan kemalangan yang berlaku dikawasan anda adalah berkaitan dengan kelajuan. Pada pendapat anda bolehkah *'traffic calming'* mengurangkan masalah tersebut?. Berikan **TIGA (3)** alasan.

(9 markah)

FINAL EXAMINATION

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COURSE *KURSUS*	: ADVANCED TRAFFIC ENGINEERING	COURSE CODE *KOD KURSUS*	: BFT 4053/40504

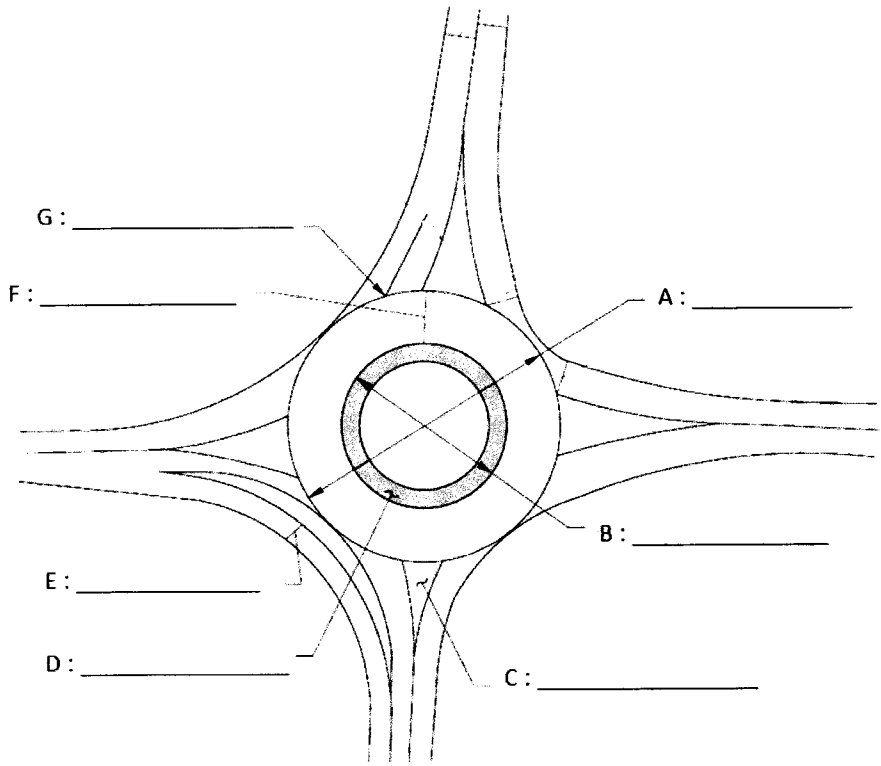

FIGURE Q4