

**Daffodil International University**  
**School of Science and Engineering**  
**Department of Civil Engineering**  
**Term Final Examination, Fall-2019**  
**Course Title: Transport Engineering I**  
**Course Code: CE 351**

Marks: 40

Time: 1.5 Hours

**Section A**

(Answer any *two* out of **four** questions)

1. a) What are the objectives of speed study? Define safe speed, design speed, pace, modal speed. [4]
- b) What are the advantages of rotary intersection? Describe the dynamic characteristics of vehicle. [4]
- c) What are the color combination and pattern combination for road marking as per UK standard? [2]
2. a) What is reaction time? [4]  
 From the following provided information determine the AADT of the rural primary road.

Hourly expansion factors			
Hour	HEF	Hour	HEF
9:00-10:00 AM	13.8	1:00-2:00 PM	14.6
10:00-11:00 AM	14.7	2:00-3:00 PM	19.4
11:00-12:00 PM	14.2	3:00-4:00 PM	24.2

Hourly expansion factors		Monthly expansion factors	
Day of week	DEF	Month	MEF
Monday	7.01	February	1.97
Tuesday	7.72	March	1.48
Wednesday	6.58	April	1.39
Thursday	7.012	May	0.948

The traffic engineer collected data shown below on a Monday during the month of May.

Hour	Volume
9:00 -10:00AM	520
10:00-11:00AM	300
11:00-12:00PM	650
1:00-2:00PM	920

- b) What are time-mean speed and space mean speed? Define: interrupted flow, forced flow, induced flow. [4]
- c) Write short note on drivers' characteristics. [2]
3. a) What are the main purposes of traffic survey? [4]
- b) What are the advantages and disadvantages of manual counting method? [4]

- c) Define VOC and VOT. [2]
4. a) Neat sketch different types of island. [4]  
 Spot data were collected at a section of highway during utility maintenance work. Determine whether there was any significance difference between average speeds at 95% confidence level. Sample size for before survey was 700 and that for after survey was 850. Comment on your result.  
 Given,  $u_1 = 50\text{mph}$ ,  $u_2 = 52\text{mph}$ ,  $S_1 = 4\text{mph}$  and  $S_2 = 12\text{mph}$
- b) Write short note on angular parking. What is traffic internal friction? [4]
- c) Define rate of flow and design hourly volume. [2]

### Section B

(Answer any *two* out of *three* questions)

5. a) What are the geometric factors of bottleneck? Where does safety problem arise? [4]
- b) Design a two phase signal for the isolated cross junction for the following data: [4]

Amber in sec	3
Red-amber in sec	2

	N-S	E-W
Inter-green in sec	9	4
Lost time in sec	2	2

Approaches				
	North	South	East	West
Arrival flow (PCU/hr)	900	420	700	635
Saturation flow (PCU/hr)	1400	1500	1300	1500

- c) What are purposes of delay study? [2]
6. a) Write short note on geometric delay and operational delay. [4]
- b) Name different types of OD survey. Why Traffic engineering is so essential now-a-days? [4]
- c) What are the manual methods of delay study? [2]
7. a) Describe indirect method of counting. Write short note on informatory signs. [4]
- b) Why parking study is needed? Narrate the problems associated with on-street parking. [4]
- c) Describe off street parking with its advantages. [2]