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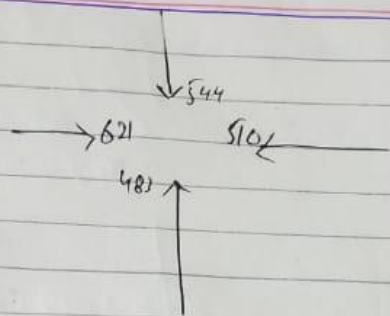
Section " "A"

Subject " Transportation Engng

Submitted to " Sir Hamza - Mustafa

(1)

Q No # 01



→ Determine yellow interval

$$y = t + \frac{1.47 S_{85}}{2a + (64.4 \times 0.019)}$$

$$S_{85} = 35 + 5 = 40 \text{ mph}$$

$$S_{15} = 35 - 5 = 30 \text{ mph}$$

$$y = 2.0 + \frac{1.47(40)}{2(10) + 64.4 \times 0.019}$$

$$y = 4.948$$

→ length of All-red clearance interval

$$S_{85} = 35 + 5 = 40 \text{ mph}$$

$$S_{15} = 35 - 5 = 30 \text{ mph}$$

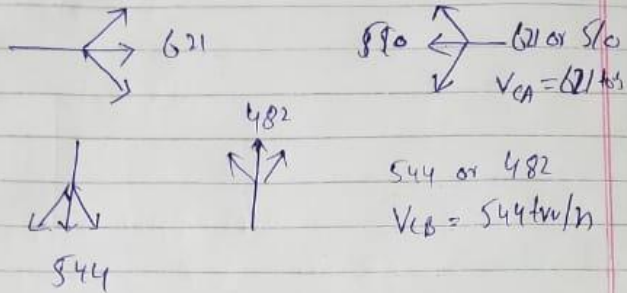
$$a_r = \frac{W + L}{1.47 S_{15}} = \frac{30 + 20}{1.47 \times 30} = 1.39 S_{15}$$

L - length of standard vehicle  
usually taken 18-20 ft

$$a_r = \frac{P}{1.47 S_{15}} = \frac{40}{1.47 \times 30} = 0.91$$

2)

→ Determine critical lane volume.



$$V_c = 621 + 544$$

$$V_c = 1165 \text{ v.u/h}$$

→ Determine of lost time.

$$Y = y + qv = 4.94 + 1.134 = 6.075$$

$$l = Y - e = 6.07 - 2.0 = 4.075$$

$$t_c = l_1 + l_2 = 2.0 + 4.07 = 6.075$$

Total cycle lost time per cycle =  $L =$

$$L = 2.0 + 6.07 = 8.07$$

→ Determine of cycle length

$$C_{des} = \frac{L}{1 - \left[ \frac{V_c}{1165 \times PIF \times V/c} \right]}$$

$$C_{des} = \frac{12.14}{1 - \left[ \frac{1165}{1165 \times 0.92 \times 0.92} \right]}$$

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$$C_{des} = 94.26 \approx 97 \text{ sec}$$

$$\rightarrow \text{Effective green time available} = 97 - 12.14 = 84.86 \text{ s}$$

$$g_V = g_{TOT} \times \left[ \frac{V_{CA}}{V_C} \right] = 84.86 \times \left[ \frac{621}{1165} \right]$$

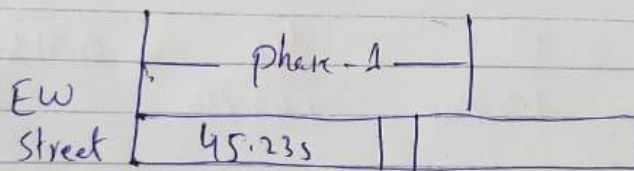
$$g_V = 45.23 \text{ s}$$

$$g_B = g_{TOT} \times \left[ \frac{V_{CB}}{V_C} \right] = 84.86 \times \left[ \frac{544}{1165} \right]$$

$$g_B = 39.63 \text{ s}$$

Check

$$45.23 + 39.63 + 12.14 = 97 \text{ sec}$$



Since two lanes are provided

$$g_C = g_{TOT} \times \left[ \frac{V_{CC}}{V_C} \right] = 84.86 \times \left[ \frac{510}{1165} \right]$$

$$g_C = 37.15 \text{ s}$$

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$$g_D = g_{TOT} \times \left| \frac{V_{CD}}{V_C} \right| = 24.86 \times \left| \frac{432}{1165} \right|$$

$$g_D = 31.47 \text{ sec}$$

Check

$$37.15 + 31.47 + 12.14 = 80.76 \text{ sec}$$

$$\text{Error} = 97 - 80.76 \\ = 16.24 \text{ sec}$$

→ Now for red interval.

$$S_{os} = 35 + 5 = 40 \text{ mph} \\ = 35 - 5 = 30 \text{ mph}$$

$$q_r = \frac{W+L}{1.47 S_{os}} = \frac{30+20}{1.47 \times 30} = 1.13 \text{ sec}$$

$$q_r = \frac{P}{1.47 S_{os}} = \frac{40}{1.47 \times 30} = 0.915$$

→ Lane Critical Volume for second lane

$$V_{cc} = 510 \text{ twu/hr}$$

$$V_{CD} = 432 \text{ twu/hr}$$

$$V_C = 510 + 432 = 942 \text{ twu/hr}$$

\* Determination of loss time is same  
So  $L = 120.145$

$$\rightarrow \text{Cales} \approx 97 \text{ sec}$$

(5)

Q No# 02

Discuss and draw different types of signs.

Ans Traffic Signs:-

The MUTCD provides specification and guideline for the use of literally hundreds of different sign for different purpose. In general traffic signs fall into one of three major categories.

### Regulatory Sign

Regulatory sign convey information concerning specific traffic regulatory. Regulation may relate to right-of-way, speed limits, lane usage, parking, or a variety of other functions.

→ Warning Signs:-

Warning signs are used to inform drivers about upcoming hazards that they might not see or otherwise discern in time to safely react.

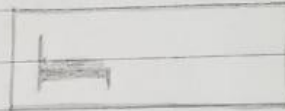
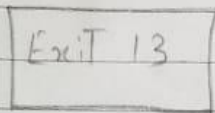
→ Guide Signs:-

Guide signs provide information on routes, destinations and service that drivers may be seeking.

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## Guid Signs:

- Route Markers and mileposts
- Destination Signs
- Recreational and cultural interest Guid Signs.
- Service Guide Signs.



(9)

→ Parking lanes:-

The parking lanes are provided in urban lanes for side parking. Parallel parking is preferred for side parking safe for vehicle moving on road. The width recommended is 2.0m.

→ Bus - Bays:-

Bus-bays are provided by recessing the kerbs for bus stops. They are provided so that they do not obstruct the movement of vehicles in the carriage way. They should be at least 90 mtrs away from the intersection.

→ Service roads:-

Service road or frontage road give access to controlled highways like freeway and expressway. The run parallel to highway and will be usually related by the separator and access to highway will be provided only at selected points.

→ Guard rails:-

A guardrail is a longitudinal barrier used to protect motorists from roadside hazards. The purpose of a guardrail is to reduce the severity of collisions by preventing a vehicle from veering off roadway into an embankment or fixed object.



## Discuss Road margins :-

- The portion of the road beyond the carriageway are generally called road margin. Various elements that form the road margins are given below.
- 1) Shoulders
  - 2) Parking lanes
  - 3) Bus bays
  - 4) Service roads
  - 5) cycle track
  - 6) Footpath
  - 7) Guard rails.

## → Shoulders :-

The portion of the roadway between the outer edges of the carriage way and Edge of the top surface of the embankment or inner edges of the side Drains in cuttings the road are called shoulders.

The shoulders are generally in level with Road surface having a slope toward Drain side.

The shoulder width recommended by IRC is 2.5 m

## → Footpath :-

A path for people to walk along especially a right of way in the country side.

⑥

## Regulatory Signs :-

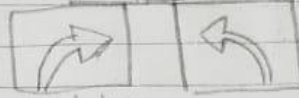
→ Regulatory sign Affecting Right-of-way

→ Speed limit signs

→ Turn prohibition signs

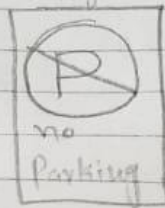
→ Lane-use signs

→ Parking control signs.



Right turn

Left turn



## → Warning Signs

→ change in horizontal alignment

→ Intersection

→ Converging traffic lanes

→ Narrow roadways

→ changes in highway design

→ Crossovers

→ Roadway surface condition

