

Name

Farhatullah Khan

ID

7883

Submitted to

Sir Hamza Mustafa

Subject

Transportation Planning & Engineering.

Semister

6th

Section

B

Date

19-9-2020

Q: No: 01

→ Determine yellow interval

$$y = t + \frac{1.47}{2A + (64.4 \times 0.01G)}$$

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

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

$$y = 2.0 + \frac{1.47(40)}{2(10) + (64.4 \times 0.01 \times 0)}$$

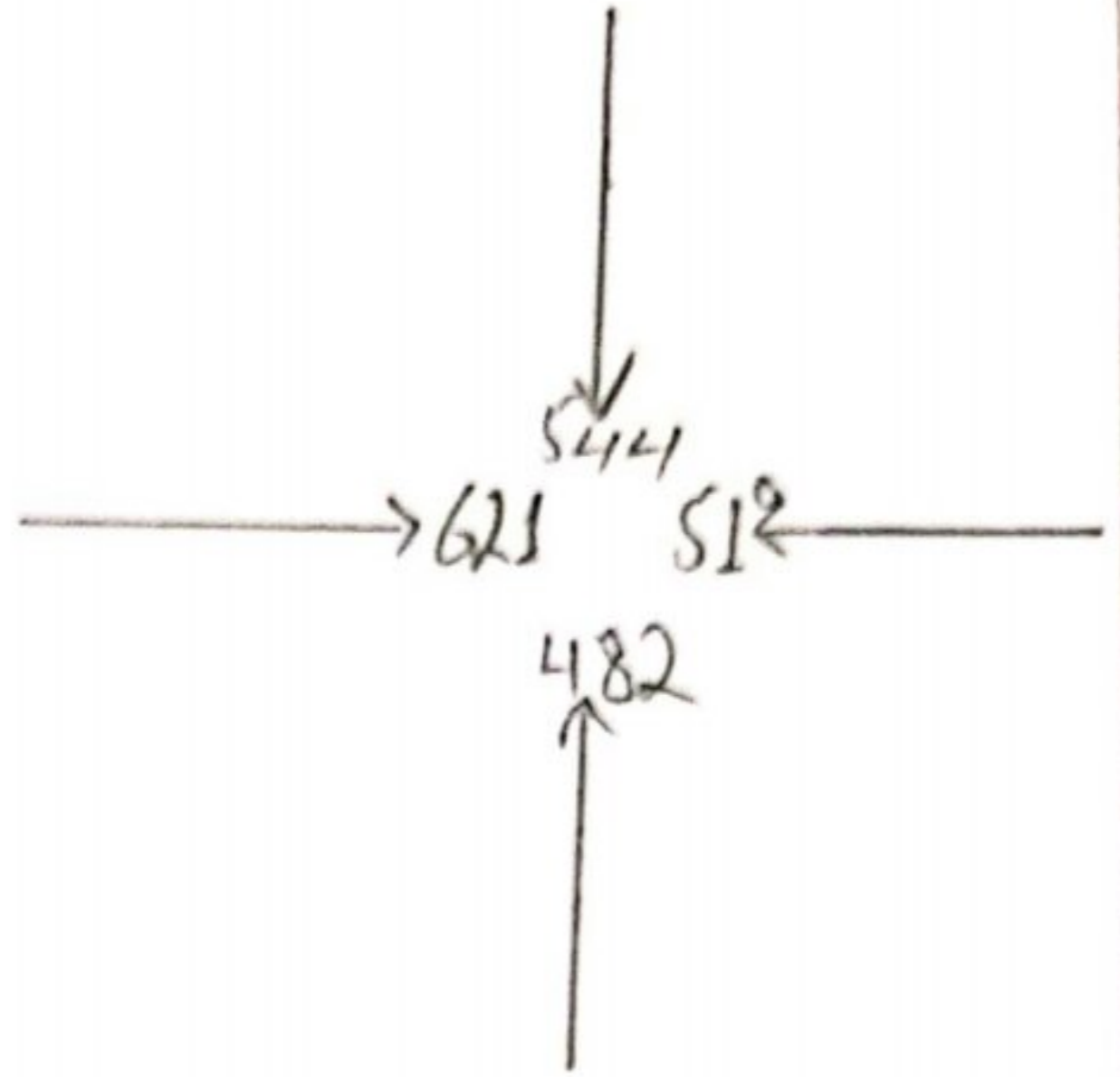
$$y = 4.94 \text{ s}$$

→ Length of all-red clearance interval.

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

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

$$AT = \frac{W + L}{1.47 S_{15}} = \frac{30 + 20}{1.47 \times 30} = 1.134 \text{ sec}$$

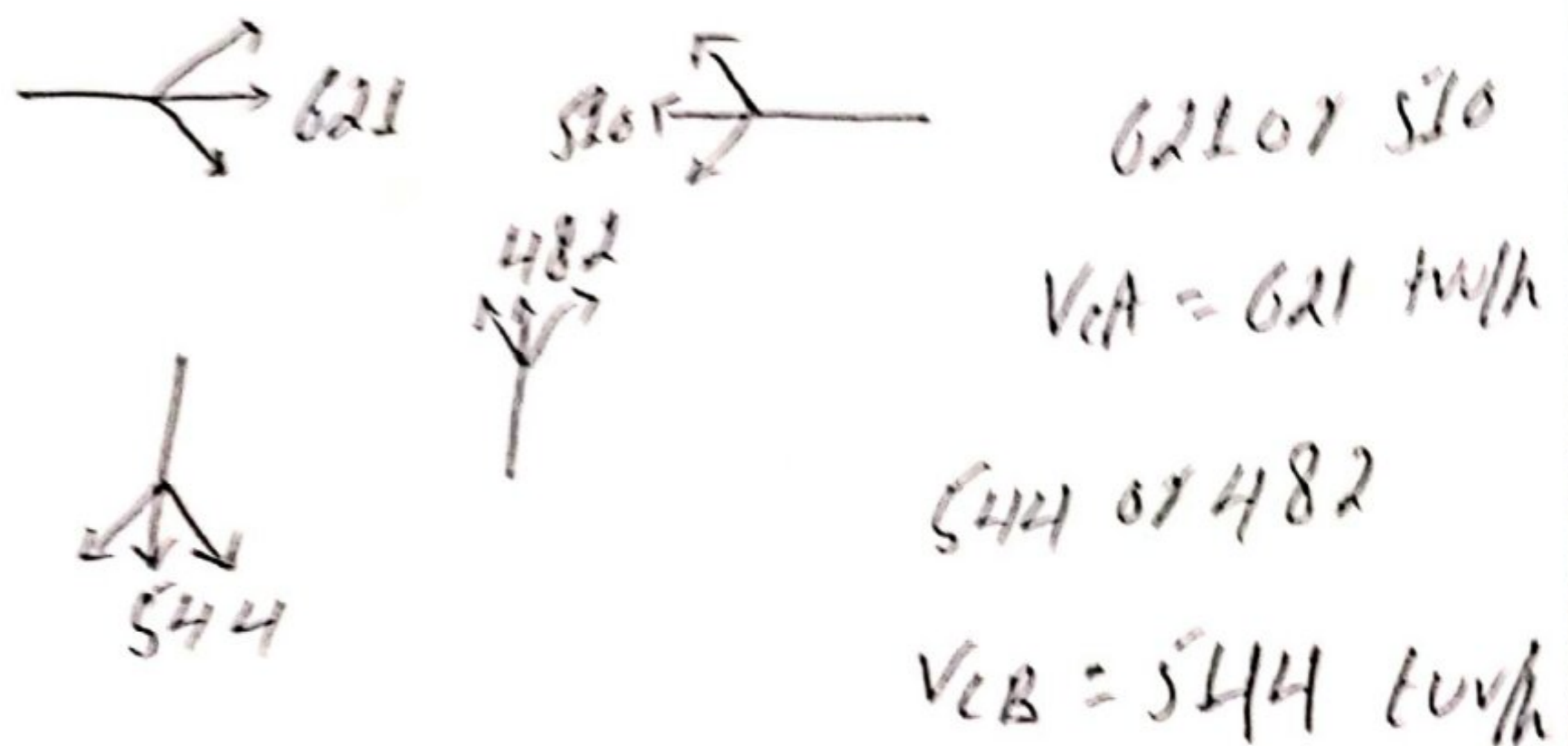


2

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

$$AV = \frac{P}{1.47 S_{15}} = \frac{48}{1.47 \times 30} = 0.91$$

→ Determine critical lane volume:



$$V_c = 621 + 544$$

$$V_c = 1165 + \text{t/h}$$

→ Determination of lost time

$$y = y + d_1 = 4.94 + 1.134 = 6.07 \text{ s}$$

$$l_2 = y - e = 6.07 - 2.0 = 4.07 \text{ s}$$

$$t_L = l_1 + l_2 = 2.0 + 4.07 = 6.07 \text{ s}$$

$$\text{Total lost time per cycle} = \frac{L = 6.07 + 6.07}{L = 12.14 \text{ s}}$$

→ Determination of cycle length:

$$C_{des} = \frac{L}{1 - \left[\frac{V_c}{1615 \times PHF \times v/c} \right]}$$

$$C_{des} = \frac{12.14}{1 - \left[\frac{1165}{1615 \times 0.92 \times 0.90} \right]}$$

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

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

$$g_A = g_{TOT} \times \left[\frac{V_{cA}}{V_c} \right] = 84.86 \times \left[\frac{0.21}{1165} \right]$$

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

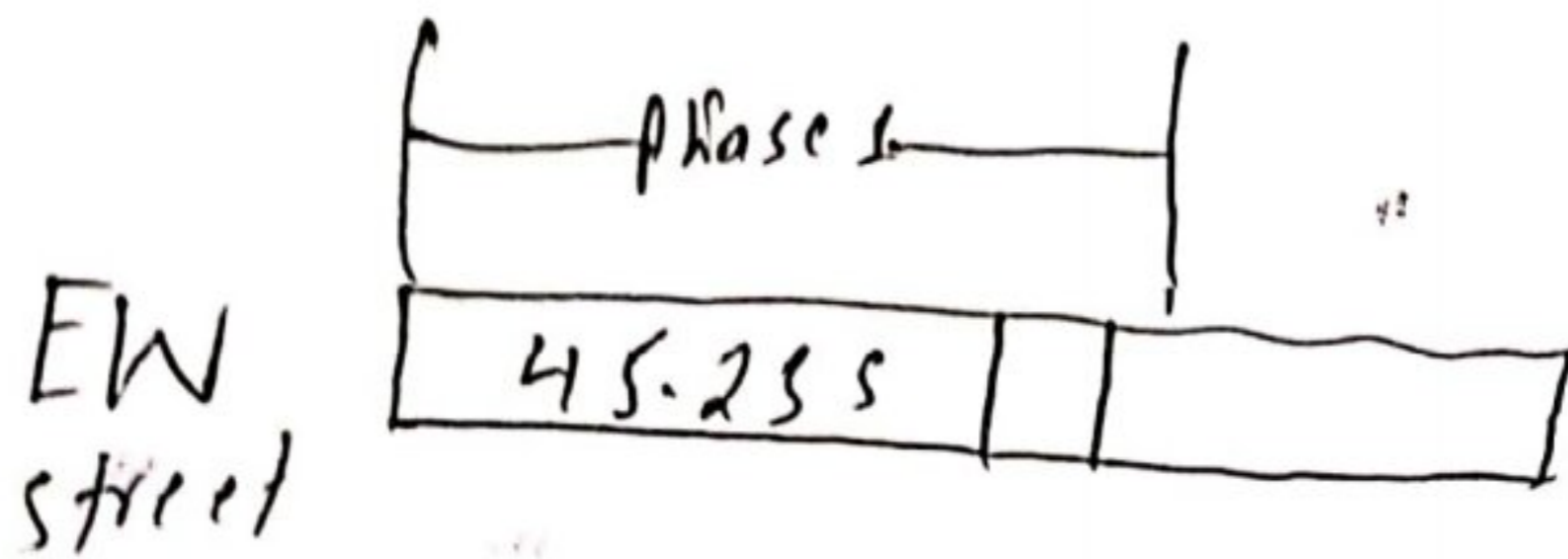
$$g_B = g_{TOT} \times \left[\frac{V_{cB}}{V_c} \right] = 84.86 \times \left[\frac{5.44}{1165} \right]$$

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

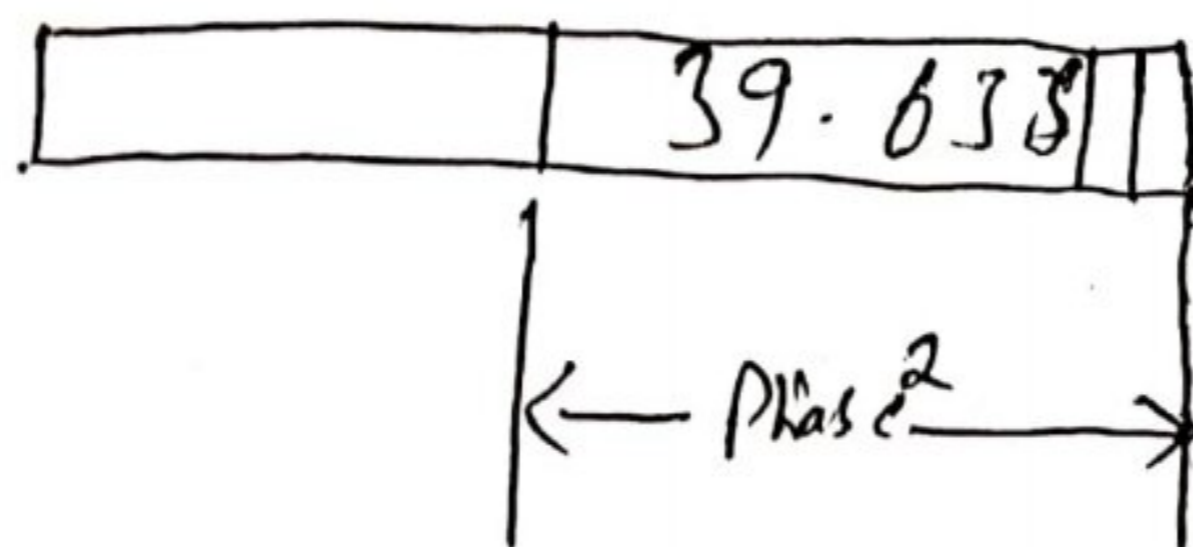
(H)

Check

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



Ns street



Since two lanes are provided

$$g_c = g_{T.T} \times \left[\frac{V_{ce}}{V_c} \right] = 84.86 \times \left[\frac{510}{1165} \right]$$

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

$$g_D = g_{T.T} \times \left[\frac{V_{cD}}{V_c} \right] = 84.86 \times \left[\frac{432}{1165} \right]$$

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

Check

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

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

$$= 16.24 \text{ sec}$$

→ NOW for red interval

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

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

$$a_1 = \frac{W+L}{1.47 S_{15}} = \frac{30 + 20}{1.47 \times 30} = 1.13 \text{ sec}$$

$$a_2 = \frac{P}{1.47 S_{15}} = \frac{40}{1.47 \times 30} = 0.91 \text{ s}$$

→ lane critical volume for second lane

$$V_{CL} = 510 \text{ (uv/h)}$$

$$V_{CD} = 432 \text{ (uv/h)}$$

$$V_c = 510 + 432 = 942 \text{ (uv/h)}$$

Determination of loss time is same

$$\text{So } L = 12.14 \text{ s}$$

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

Q:- No: 02

Discuss and Draw different types of traffic signs.

Ans: Traffic signs:

→ The MUTCD provides specifications and guidelines for the use of literally hundreds of different purpose. In general traffic signs fall into one of three major categories.

→ Regulatory signs:

Regulatory signs convey information concerning specific traffic regulation. 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 services that drivers may be seeking.

Regulatory signs.

→ Regulatory signs Affecting Right of way

- Speed Limit signs
- Turn Prohibition signs
- Lane-use signs
- Parking control signs.



Right turn



Left turn



Straight through or left turn



Straight through or right turn

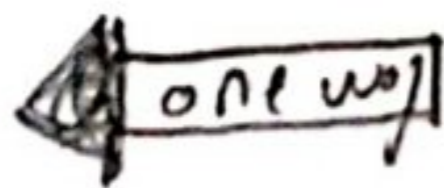
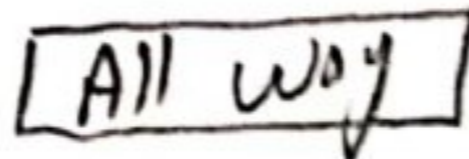
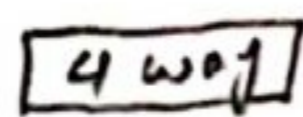


Straight through only



Left turn Lane control

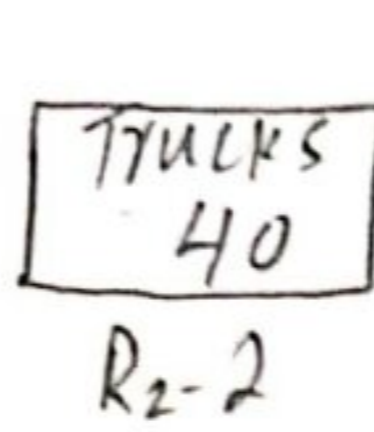
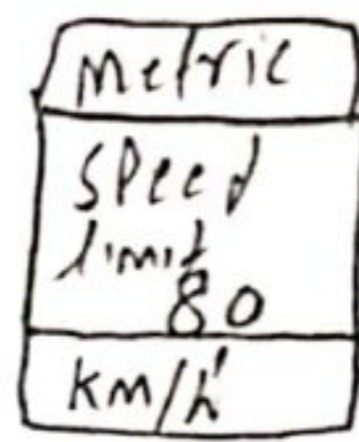
Regulatory signs Affecting Right-of-way



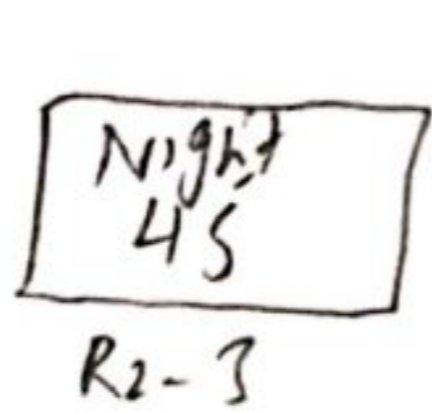
Regulatory signs (Speed Limit signs)



or



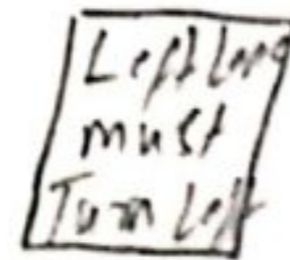
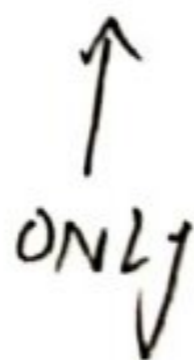
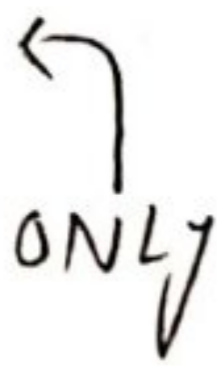
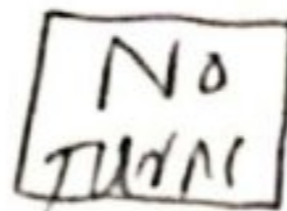
or



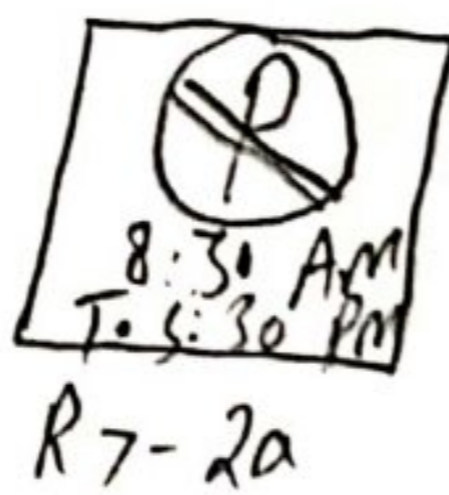
or



Regulatory signs (Turn Prohibition signs)



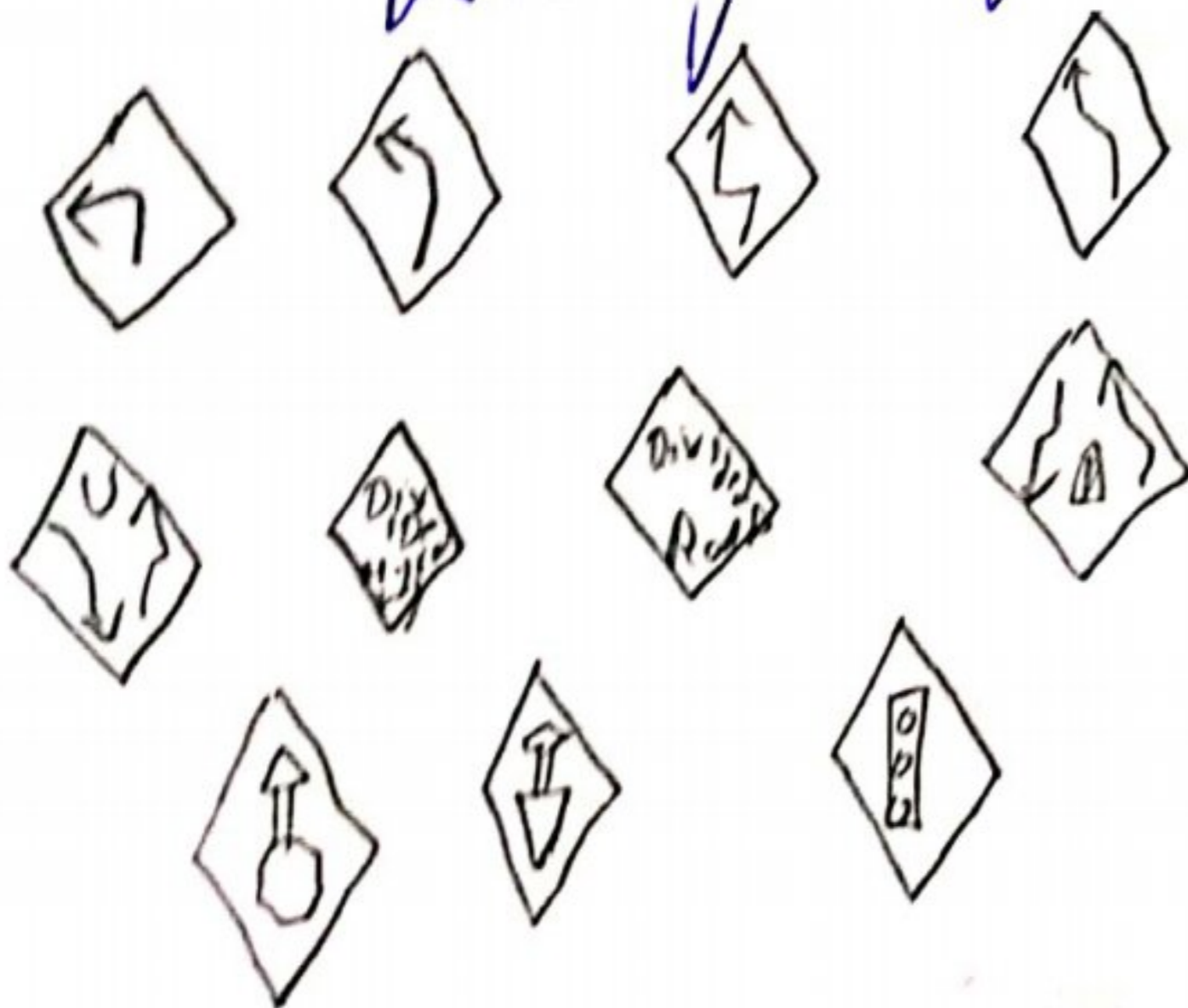
Regulatory signs (Parking control signs)



Warning signs:

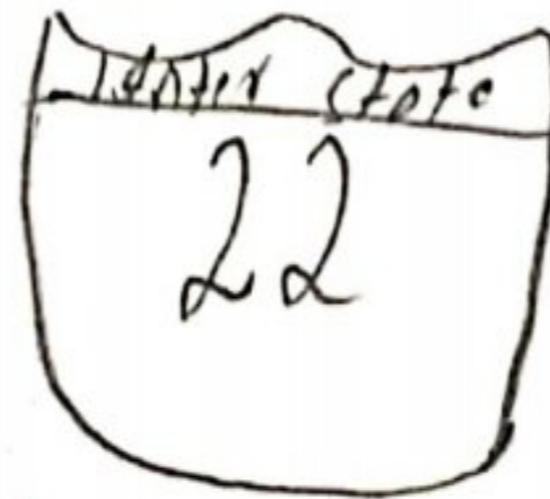
- changes in horizontal alignment.
- Inter sections
- Advance warning of control devices
- converging traffic lanes
- Narrow roadways
- change in highway design
- Grade
- Roadway surface conditions.

Warning signs

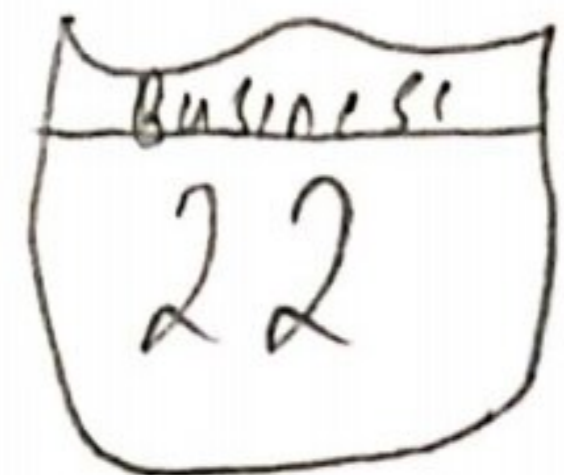


Guide signs:

- Route markers AND mileposts
- Destination signs
- Recreational and cultural-interest guide signs
- Service guide signs.



interstate
Route
sign
M1-1



off interstate
Route sign
M1-2 (Loop)
M1-3 (Sovr)

Q: No: 03

Discuss Road Margins

Ans: Road Margins:

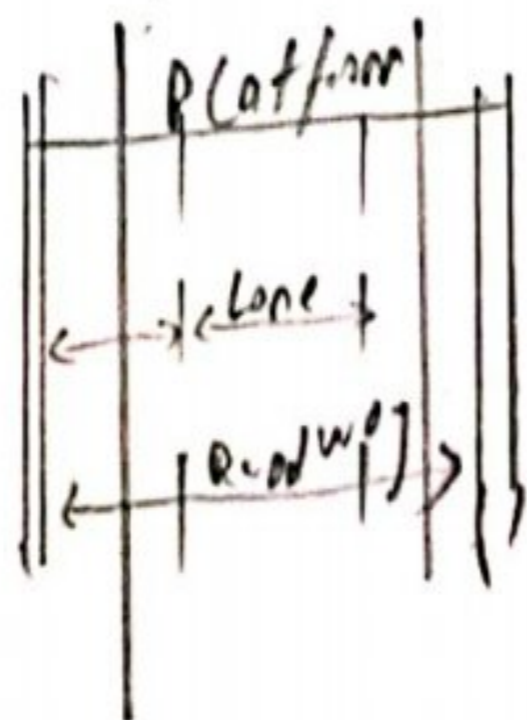
→ The portion of the road beyond the carriageway and on the roadway can be generally called road margin. Various elements that form the road margins are given below.

- 1 - Shoulders
- 2 - Parking lanes
- 3 - Bus-bays
- 4 - Service roads
- 5 - Cycle track
- 6 - Foot path
- 7 - Guard rails.

1) Shoulders:

Shoulders are provided along the road edge and is intended for accommodation of stopped vehicles, serve as an emergency lane for vehicles and provide lateral support for base and surface course. The shoulder should be strong enough to bear the weight of a fully loaded truck in wet conditions.

The shoulder width should be adequate for giving working space around a stopped vehicle it is desirable to have a width of 4.6m for the shoulder. A minimum width of 2.5m is recommended for 2-lane rural highways.



2) Parking lanes:

Parking lanes are provided in urban lanes for side parking. Parallel parking is preferred because it is safe for the vehicles moving on the road. The parking lane should have a minimum of 30m width in the case of parallel parking.

3) 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 75 meters away from the intersection so that the traffic near the intersection.

4) Service roads:

Service roads or frontage roads give access to controlled highway like freeways and Express ways. They run parallel to

the highway and will be usually isolated by a separator and access to the highway will be provided only at selected points.

- These roads are provided to avoid congestion in the expressways and also the speed of the traffic in those lanes is not reduced.

5) Cycle track:

Cycle tracks are provided in urban areas when the volume of cycle traffic is high. Minimum width of 2 meters is required which may be increased by 1 meter for every additional track.

6) Foot path:

Foot paths are exclusive right of way to pedestrians, especially in urban areas. They are provided for the safety of the pedestrians when both the pedestrian traffic and vehicle traffic is high. Minimum width is 1.5 meters and may be increased based on the traffic.

~~Guard rails~~

7) Guard rails:

They are provided at the edge of the shoulder usually when the road is on an embankment. They serve to prevent the vehicles from running out of the embankment, especially when the height of the embankment exceeds 3m. Various designs of guard rails are there. Guard stones painted in alternate black and white are usually used. They also give better visibility of curves at night under headlights of vehicles.