

DEPARTMENT OF CIVIL
ENGINEERING

FINAL TERM
EXAMINATION

SUBJECT::HIGHWAY&
TRANSPORTATION
ENGINEERING

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Q No 01 Define traffic volume and Classification in details.

Traffic volume is defined as the time rate of vehicle flow.

The number of ^{OR} vehicles passing through a given point on a road during a specified period of time

A point on the road is selected and vehicles are counted crossing that point either in one direction or in both directions or in one lane.

The period of time may be one minute, one hour or one day.

It is commonly expressed as vehicles per hour and vehicles per day.

The following objectives of traffic volume study are objects and uses of traffic volume study. Traffic volume study is used in planning traffic operation and control of existing facilities.

Classification of Traffic Volume

Traffic volume may be classified as
Daily Traffic volume. Hourly Traffic volume
Sub-hourly Traffic volume.

Daily TRAFFIC Volume.

The total number of vehicles passing through a point whole day (24 hours) is called Daily traffic volume.

Daily volume is used as basis for highway planning and general observation of trends.

Four Daily volume parameters are often used which are as follow.

- Annual Average Daily Traffic (AADT)
- Annual Average Weekly Day Traffic
- Average Daily Traffic
- Average Weekly Day Traffic

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Hourly Traffic Volume.

The number of vehicles passing through certain point in one hour is known as Hourly Traffic Volume.

There is a lot of variation in traffic volume during the course of 24 hours of the day.

The maximum volume occurs during morning and evening because during this period people go to or coming from offices which are usually called Rush hours of day.

i) Peak Hour volume, ii) Design Hourly volume

Sub-Hourly volume

It is the number of the vehicle counted for a time period less than one hour, say 15 minutes, 30 minutes etc.

Sub-Hourly volume expressed as vehicles per hour is called Rate of flow.

Examples Rate of flow = $1200 / (15/60) = 4800$ vehicles per hour

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Q No 02 write a note different
Cross Sectional Elements of Road.

Ans

Cross Sectional Elements

- ① Pavements Surface Characteristics
- ② width of pavement or carriageway
- ③ Cross Slope or Camber.
- ④ Median or Traffic Separator.
- ⑤ Kerbs, ⑥ Road Margins ⑦ width of Formation.

1) Pavement Surface Characteristics
The important surface characteristics of the pavements are Friction, unevenness, light reflecting characteristics, Drainage of surface water

2) width of pavement:
It is total width of road on which vehicles are allowed to move. The width of pavement depends on width of traffic lane and number of lanes.

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(iii) Cross Slope OR Camber:

Cross Slope or Camber is the slope provided to the Road Surface in the transverse direction to drain off the rain water from the Road Surface.

Drainage and disposal of water from Pavement is considered important because of the following reason:

- (a) To maintain stability, surface condition and increase of life of pavement.
- (b) To prevent stripping of bitumen from aggregates.
- (c) To prevent slipping of vehicles running at high speed.

4) MEDIAN OR TRAFFIC Separator:

Median is provided b/w two sets of traffic lane intended to divided the traffic moving in opposite directions. The main function of the median is to prevent head-on collision b/w vehicles moving in opposite direction on adjacent lanes.

(5)KERBS

Kerbs indicates the boundary b/w the pavement and median or foot path or shoulder. Kerbs may be mainly divided into three groups based on their function.

- (a) Low kerb, (b) Semi-barrier type, (c) Barrier-type kerb.

Road :: The various elements included in the road margins are.

- (a) Shoulder, (b) Guard Rail
- (c) Foot path, (d) Drive way,
- (e) cycle track, (f) parking lane (g) Embankment slope.

7) width of Formation or Roadway.
width of formation or roadway is the sum of widths of pavement or carriage way including separators, if any and the shoulders.

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Q No. 03 (a) What is Sight distance and write its types in details.

Ans

Sight distance types

The actual distance that is observed along the Road Surface which is visible for a driver from a specified height above the carriage way is called as the sight distance at a point. This distance will let the driver see all the stationary and the moving objects in front of the vehicles.

In the geometric design of road construction mainly three sight distance are taken into consideration. They are

SSD: Stopping sight distance.

ISD: Intermediate sight distance.

OSD: overtaking sight distance.

Other than these we have

Head light sight distance.

Safe sight distance.

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⇒ Stopping Sight distance

If the Road possesses an ascending gradient in an amount equal to $+n\%$ to the braking action the Component factor of gravity will be added. This will decrease the braking distance

$$SS = vt + \frac{v^2}{2g(\pm 0.1n)}$$

⇒ Intermediate sight distance.

A distance equivalent to twice the Stopping Sight distance is termed as intermediate sight distance. Here, overtaking could be attempted with reasonable safety.

Intermediate sight distance = $2 \times$ Stopping sight distance.

⇒ Overtaking sight distance.

The minimum distance available for the driver to safely overtake the slow vehicle in front of him by considering the traffic in the opposite direction is called as the overtaking sight distance. It is 1.2m above the road level can easily see the top of the object. 1.2m above the road surface.

Q No 03 (B) write briefly note on different types of intersection?

Ans =

Types of Intersection

There are two main types of intersection of Road:

- ① Grade-Separated intersection or interchanges
- ② At-grade intersection

i) Grade Separated Intersection:

It is a bridge that eliminates crossing conflicts at intersection by vehicle separation of roadways in space.

Route transfer at Grade Separations is accommodated by interchange facilities consisting of ramps

The interchange configurations are designed in such a way to accommodate economically the traffic requirements of flow operation on the crossing facilities, physical requirement of the topography.

AT Grade Intersections:

At grade intersection in which all the exchanges b/w the road takes place on the same plane.

There are of two main types:

Standard at-grade intersections

Round about at-grade intersections

Most intersection have three or four legs but multi-leg intersections (five and even six-leg intersection) are not unusual.

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{ A Studing is nothing without
Teachers }

{ Home is nothing with Sweet mom }