

Mid term Paper

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Section

A

Subject

Highway & Traffic Engg

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Submitted To

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Q:- 1/ Different Modes of Transportation.

- ⇒ Highways
- ⇒ Railways
- ⇒ Airways
- ⇒ Waterways
- ⇒ Continuous flow system

* Compare Highways with Railways:

⇒ Highways:

- It gives the maximum service to one and all.
- It is a multi-lanes roadway, specially built for high speed.
- Other modes are dependent on it.
- It provides door to door service.
- Motor engines are cheaper in cost than rail engines.
- It saves the time for short distance.

⇒ Railways:

- The transportation along railways could be advantageous by railways between the station

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both for Goods & Passenger.

-) It depend on the road transport i.e, road could as a feeder system.
-) Energy require to drag a unit load through unit distance by the railway is only $\frac{1}{4}$ to $\frac{1}{5}$ of that required by road.
-) Safety (minimum crash rate is handled carefully else sever crash can occur).
-) Require large amount of government investment.

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Office Study as a preliminary step for design of new highway:-

Ans The first step in any highway location study is the examination of all available data of the area in which road is to be constructed.

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⇒ we will indicate whether any of the specific sites should be excluded from further consideration because of one or more of the above characteristics.

As preliminary analysis, following are data with area characteristics:

- ⇒ Topography of the area.
- ⇒ Location of historic sites.
- ⇒ Climate & traffic volume of the area.
- ⇒ Types of wild life exist.
- ⇒ Construction cost.
- ⇒ Geology of the area.
- ⇒ Land use and zoning patterns.

After preliminary location survey, following elevation are done.

⇒ Economic Elevation:-

Economic Elevation of each alternative route is carried out to determine the future effect of investing the resources necessary to construct the highway.

Factors in Economic Elevation:

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- ⇒ Road user cost
- ⇒ Construction cost
- ⇒ Road user benefits.
- ⇒ Maintenance costs.
- ⇒ Road user dis-benefits.
- ⇒ Environmental Elevations

- ⇒ Highway construction at any location.
- ⇒ An integral part of the local environment
- ⇒ Environmental includes plants, animals, human communities.
- ⇒ Essential to evaluate environmental impact of alignment selected.
- ⇒ These variables are interrelated in a manner that maintains equilibrium and sustains the life style of the different communities.

Q: 4/ Importance of vehicular performance in highway design:

Acceleration and deceleration rates of vehicles are often critical parameters in determining highway design.

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Rates that often govern the dimension of such design factors:

- ⇒ Freeway ramp
- ⇒ Effect of Road grades.
- ⇒ Climbing or passing line.
- ⇒ Effect of Pavement Friction.
- ⇒ Turnout bays for buses.
- ⇒ Acceleration & deceleration lanes.
- ⇒ Highway alignment.
- ⇒ Determine the need for truck climbing lanes.

Q: 4/ Directional Distribution:-

- ⇒ Highway must be designed to adequately serve the peak hour traffic volume in peak direction of flow.
- ⇒ In design of highways with more than two lanes and on-two lanes roads where important intersections are encountered or where additional lanes are to be provided later, knowledge of hourly traffic volume for each direction of

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Travel is essential - Directional traffic is used for multilane roads and streets.

→ Typically, one direction contributes by 55-70% in total traffic, although occasionally 80% is observed.

Q:- 57 Board classification of surface

Distress mode:-

Surface distress modes can broadly be classified into the following three groups.

1) Fracture:-

This could be in the form of ~~do~~ cracking or breaking, generally due to excessive loading, fatigue, thermal changes.

2) Distortion:-

This is in the form of deformation, which can result from such things as excessive loadings, densification, or subgrade issues.

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3) Disintegration:- This is in the form of stripping or raveling or removal of paving materials, which can result from such things as loss of bonding, chemical reactivity or binder aging.

Q: 6/1) Alligator Cracking:-

- ⇒ Alligator cracking may be considered a combination of fatigue and block cracking.
- ⇒ Alligator cracking develops into a many sided pattern that resembles chicken wire or alligator skin.

2) Block Cracking:-

- ⇒ A pattern of cracks that divides the pavement into approximately rectangular pieces, with sides generally longer than one foot - size range $0.1\text{m}^2 - 10\text{m}^2$.
- ⇒ Possible cause - shrinkage of asphalt.

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3) Longitudinal Cracking:

Cracks predominantly parallel to Pavement Centerline. Location within the lane - (wheel path versus non-wheel path) is significant.

⇒ Possible Causes:

Expansion & contraction of pavement material
roadbed settlement, poorly constructed paving joints.

4) Transverse Cracking:

The type of cracking occur perpendicular to the centerline of asphalt pavement.

⇒ Possible Causes:

→ Shrinkage of Asphalt layer or reflection from existing crack.

→ Poorly constructed joint.

→ Poorly road bed settlement.

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