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Q.01

Ans:-

Different modes of Transportation:

Transport modes are the means by which passengers and freight achieve access and mobility between origin and destination.

There are one of three basic categories depending over what median is used to travel upon.

1. Land (road, rail and pipelines)
2. Water (shipping)
3. Air (Aircrafts)

> Highways:-

Car, bus, Truck, non-motorized-etc.

> Railways:-

Passenger and goods (Freight trains)

> Airways:-

Aircraft, Helicopters and Hot-air balloon.

> Waterways:- Ships, boats, Submarine...etc.

> Continuous Flow Systems

> Airways:-

- i) Fastest among all other modes
- ii) More comfortable
- iii) Time saving.
- iv) Uneconomical

> Waterways:-

- i) Slowest among all other modes.
- ii) It needs minimum energy to drag unit load through unit distance.
- iii) This can be possible between ports on the sea routes or along the river.
- iv) Economical.

Compare Railways and Highways

Railways
 The transportation along the railways track could be advantageous by railways between the stations both for the

Highways
 . It gives a maximum service one and all.
 . It gives maximum flexibility for travel with reference to route choice, direction, time

passengers and goods particularly for long distance

• It totally depends upon the road transport i.e. road could serve 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.

• Safely (minimum crash rate if handled

carefully else sever crash can occur

and travelling speed.

• It provide door to door service.

• Other modes are depend on it.

• It requires small investment for the government

• Motor vehicles are cheaper than other carriers like rail engines.

• It saves the time for short distance

High degree of

accident due to

flexibility of movement.

Q.2.

Ans:-

I am a transport engineers first we taken.

Phases of Highway Location Process

- > Office Study of existing information.
- > Reconnaissance Survey.
- > Preliminary location Survey.
- > Final location Survey.
- > OFFICE Study of existing information.
- > Data Examination (office study):-

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

> This phase is usually carried out prior to any field or photogrammetric investigation.

> Data Sources:-

we can collect data from national/ provincial departments, agriculture geology

hydrology and mining.

→ From Maps.

→ From charts.

→ Aerial photographs.

Area Characteristics covered in data:-

Engineering including topography, geology, climate and traffic volumes.

→ Social and demographic, including land use and zoning patterns.

→ Economics, including unit costs for construction and the most trend of agricultural, commercial, and industrial activities.

> Preliminary analysis of the data:-

Will indicate any of the specific sites should be excluded from further consideration because of one or more of the above characteristics.

For example:

If it is found that a site of historic and archeological importance

is located with an area being considered for possible route location it may be immediately decided that any route that traverses that site should be excluded from further consideration.

⇒ At the completion of this phase of the study, the engineers will be able to select general areas through which the highway can traverse.

Preliminary Location Survey:

During this phase of the study, the positions of the feasible routes are set as closely as possible by.

- 1) Establishing all the control points.
- 2) Determining preliminary vertical and horizontal alignment for each.

⇒ Preliminary alignments are used to evaluate the economic and environmental feasibility of the alternative routes.

Economic Evaluation:-

7

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

> Factors Considered in economic evaluation

- Road user costs.
- Construction costs.
- Maintenance costs.
- Road user benefits
- Provide information on the economic resources that will be gained or lost if a particular location is selected.

> Environmental Evaluation:

- Highway construction at any location - significant impact on surroundings.
- A highway - an integral part of the local environment.
- Environment includes plant, animal, and

human communities and encompasses social, physical, natural, and man-made variables.

The construction of a highway at a given location may result in significant changes in one or more variables, which in turn may affect the equilibrium and result in significant adverse effects on the environment.

The above all we discuss from this we can also collect data from that. and we can also know about the reference material of the highway if we study the above material like aggregates, earth and other environment etc.

Q.No.3:

Ans: Importance of Vehicle:-

The importance of vehicle performance in highway design.

The acceleration and deceleration of the vehicle or motor bus etc are often critical parameters in determining highway design.

The design factors are following.

- Passing or climbing lanes.
- Freeways ramp.
- Acceleration and deceleration lanes.
- Turnout bays for buses.
- Determine the need for truck climbing lanes.
- Highway alignment (passing and stopping sight distance).

Q. No. 4

Ans.:

Directional distribution:-

The directional distribution may be define as highways must be designed to adequately serve the peak hour traffic volume in the peak direction of flow.

→ The total hourly traffic in both directional is used to design two lane roads.

→ In the construction of highway with more than two lane and on two-lane roads where important interfections are encountered or where additional lanes are to be provided later. Knowledge of the hourly traffic volume for each direction of travel is essentive Directional traffic is used for multilane roads and

Streets.

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

Example:-

Consider a rural road with a design volume of 5000 vehical per hour (VPH) for both directions of travel combined.

Q.05

Ans:- Distress:-

Distress is a condition of the pavement structure that reduces serviceability or leads to a reduction in service life.

Classification:-

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

Fracture:-

This could be in the form of

12
cracking or breaking due to more load and fatigue thermal changes

Distortion:-

This is define as the deformation which can result from such things as excessive loading, densification, consolidation or subgrade issues.

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, traffic abrasion, aggregate degradation or binder aging.

Q.No.6:-

Ans:-

Alligator Cracking:-

Crocodile cracking also called alligator cracking.

→ Alligator cracking may be considered a combination of fatigue and block cracking.

→ Occurs in areas subjected to repeated traffic loadings.

→ Alligator cracking develops into a many sided pattern that resembles chicken wire or alligator skin.

→ It is a series of interconnected cracks of various stages of development.

Block Cracking:-

The block cracking.

may be define as that the pavement divides into approximately rectangular pieces. It sides longer than one foot.

→ Rectangular blocks range in size from approximately 0.1m^2 to 10m^2 .

Transverse Cracking:

This can be defined as cracks perpendicular to the pavement's centerline or laydown direction.

(or)

It is an unconnected crack that runs across a road pavement perpendicular to the direction of the road.

Cause:-

By the shrinkage of the asphalt layer or reflection from an existing crack.

Longitudinal Cracking:

The longitudinal cracking may be defined as the pavement cracking predominantly parallel within the lane (wheel path) versus

non-wheel path) is significant.

Possible causes:-

Expansion and contraction of
pavement materials road bed
settlement poorly constructed
paving Joints.