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①: Keeping in view different modes of Transportation compare railways with highways

Ans: Highways

⊙ Frequency of Accident is more

⊙ Maintenance cost is less

⊙ Door to Door Service is available

⊙ Load carrying capacity is less

⊙ Suitable for any distance

Railways

⊙ Frequency of Accident is less

⊙ Maintenance cost is more

⊙ Door to Door Service is not available

⊙ Load carrying capacity is more.

⊙ Suitable for long distance.

②: you are transportation engineer. you have been task to conduct office study as a preliminary step for design of new highway. what reference material you will study and what data you will extract.

Ans: 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.

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Data source :- (National / provincial departments, Transportation, Agriculture, Geology and Hydrology)

- ⊙ Existing Engineering reports
- ⊙ Maps
- ⊙ Aerial photographs
- ⊙ Charts

The type and amount of data collected and examined depend in the type of highway being constructed.

Area characteristic covered in data collection

- ⊙ Engineering including topography, geology, climate and traffic volume.
- ⊙ Environmental including types of wild life, location of recreational and historical and archeological sites and the possible effects of air noise and water pollution

Preliminary analysis of the data :-

- ⊙ will indicate whether any of the specific sites should be excluded from further consideration because of one or more of their above characteristic

For example it is found that a site of historic and archeological importance is located within an area being considered for possible route location

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it may be immediately decided that any route that traverse that side should be excluded from further consideration it is the completion of this phase of the study and the engineer will be able to select the area of through which the highway can traverse.

(3): What is importance of vehicle performance in highway design?

Ans: Importance of vehicle performance in highway design of the following parts.

- ⊙ Highway ramps
- ⊙ Climbing or crossing lanes
- ⊙ Adequate passing and stopping sight distance.
- ⊙ Maximum grades
- ⊙ Setting speed limits
- ⊙ Braking also effects vehicle performance
- ⊙ Acceleration and deceleration lanes

(4): Write short note on directional distribution in design highway.

Ans: Directional distribution :- The directional distribution

is defined as the percentage of heavier volume over the total highway volume.

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- ⊙ Total hourly traffic in both directions is used to design two-lane roads.
- ⊙ In design of highways with more than two lanes.
- ⊙ Two-lane roads where important intersections are encountered or where additional lanes are to be provide later; knowledge of the hourly traffic volume for each each direction of travel is essential.
- ⊙ Directional traffic is used for multilane roads and streets.

Example: ⊙ For example consider a rural road with a design volume of 4000 vehicles per hr for both direction of travel combined.

- ⊙ if during the design hour, the directional distribution is equally split, or 2000 vph in one direction two lanes in each direction may be adequate.

⑤: Explain broad classification of Surface distress mode ?

Ans : classification of surface distress modes have three categories.

- (1) Fracture
- (2) Distortion
- (3) Disintegration

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①: Fracture :- Fracture may be in the form of cracks (can flexible and hard floors) or it may be caused by excessive load, fatigue, thermal change, water loss, shrinkage.

②: Distortion :- This is a form of deformation which may be caused by overload creep, density, swelling / frost action.

③ Disintegration :- This is a form of stripping from such things as spalling which can result from such things as loss of bonding, chemical reactivity, abrasion, poor consolidation.

④: Explain Alligator cracking, block cracking, longitudinal cracking and Transverse cracking.?

Ans:- ① Alligator cracking :- Alligator cracking can be considered a combination of fatigue and block cracking.

② it is a series of interconnected cracks at different stages of development.

③ Alligator cracking develops in a multi-dimensional form, similar

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to the chicken wire or alligator skin.

① occurs in areas with frequent traffic loads.

② Block cracking :- Block cracks are interconnected cracks that divide the pavement into approximate rectangular pieces.

① Rectangular block ~~size~~ range in size from approximately 0.1 m^2 to 1 m^2

② caused by shrinkage of the asphalt concrete and daily temperature.

③ Longitudinal cracking :- Longitudinal cracks

are parallel to the pavement centerline direction caused by poorly constructed paving line joint

shrinkage of Alligator crack surface due to low temperature of the asphalt.

④ Transverse cracking :- Transverse cracks extend across the pavement at approximate right angles to these type of cracks are not usually load associated.

End