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Section : "B"

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Question No 1

Keeping in view different modes of transportation compare railways with highways:

Answer:-

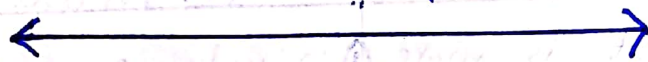
Railways	Highways
① Maintenance cost is more.	① Maintenance cost is less
② The required strength of rail way tracks are more.	② The required strength of roadway are less.
③ Frequency of accidents is less.	③ Frequency of accidents is more
④ Door to door service provision is not available.	④ Door to door service provision is available
⑤ The railway routes are meant only for the movement of train.	⑤ The highways routes require more width of right of way
⑥ The rail way routes require less width of right of way.	⑥ Highway routes are meant for the movement of busses, trucks and pedestrians etc.

⑦ load handling capacity of rail ways is more and that too at high speeds.

⑦ load handling capacity of road vehicles is less and that too at low speeds.

⑧ Suitable for long distance traveling, and movement of goods.

⑧ suitable for any distance travelling, mainly short distance.



"Question No: 07"

You are a transportation engineer. you have been asked to conduct office study as a preliminary setup / step for design of a study new highway. what reference material you will study and what data will you extract.

Answer:-

Data Examination:-

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

⇒ 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.

### Data sources :-

The Departments of transportation, agriculture, geology, hydrology and mining may be a source of data. The data may be ~~in the form of~~

- (i) Maps
- (ii) Aerial photographs
- (iii) Engineering reports
- (iv) Charts.

### Area characteristics covered in data collection.

⇒ Engineering characteristics such as topography, geology, climate, and traffic volumes.

⇒ Social and demographics, including land use and zoning patterns.

⇒ Economic aspects, including unit cost for construction and the trend of agricultural

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, commercial and industrial activities.

### Preliminary analysis of Data:

At the completion of this phase study the engineer will be able to select main general areas through which the highway can be passed.



### "Question No : 3"

Q: what is the importance of vehicle performance in highway design?

Answer:-

=> vehicle performance is important in highway design because no single unit of geometric design standards can be used for all highways.

=> Acceleration and deceleration rates of vehicles are often critical parameter in determining highway design.

=> vehicle performance in highway

design is important for:-

- Acceleration / Deceleration lanes
- Maximum grades
- setting speed limit
- Adequate passing and stopping distance (sight).
- Highway Turnout bays for buses.
- setting speed limit
- Freeway ramps.
- Climbing or Passing Lane.



### "Question No : 4"

Q: write a short note Directional distribution in design of highways.

### Directional Distribution:-

In the design of highways with more than two lanes and where additional lanes are expected to be provided later, knowledge of hourly traffic volume for early direction of travel is essential.

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

⇒ Highways must be designed to adequately serve the peak-hr traffic in both directions is used to design two-lane road.

For example.

A rural road with design volume of 4000 vehicles per hour for both directions of travel. If 80% of DHV is in one direction, at least three lanes in each direction would be needed for the 3200 vph.



"Question :05"

Q: Explain broad classification of surface distress modes.

Answer: surface modes can be broadly classification into the three groups.

### Distortion:-

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

### Fractures:-

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

### Disintegration:-

This is in the form of stripping or removal of paving material, which can result from such things as loss of bonding, chemical reactivity, traffic abrasion aggregate degradation or binder aging.





"Question no : 06"

Explain alligator cracking, block cracking, longitudinal cracking and transverse cracking?

Alligator cracking:-

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

=> It is a series of interconnected cracks of various stages of development.

=> Alligator cracking develops into a many-sided pattern that resemble chicken wire or alligator skin.

Block cracking:-

A pattern of cracks that divides the pavement into approximately rectangular pieces, with sides generally longer than one foot.

Possible cause:-

Shrinkage of asphalt.

### Longitudinal Cracking :-

These are the cracks which are predominantly parallel to Pavement center line. Location within the lane.

#### Possible causes:-

Expansion and contraction of Pavement material, roadbed settlement, Poorly constructed Pavement joints.

### Transverse Cracking:

These are an unconnected crack that runs across a road pavement, perpendicular to the direction of the road.

#### Possible causes:-

Expansion and contraction of Pavement material, roadbed settlement, Poorly constructed Paving joints.