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Section = B

Subject = Highway and Traffic
Engineering

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Examination MID TERM

QNO1:- Keeping in view modes of Transportation Compare railway and highways-

ANS:-

"Highway":-

- 1) In Highway the Frequency of accident are more-
- 2) The maintenance Cost is less-
- 3) It is suitable for any distance-
- 4) Door to Door Service are available-
- 5) The Load Carrying Capacity is less-

"Railway":-

- 1) In Railway the Frequency of accident is Less-
- 2) The maintenance Cost is more-
- 3) It is suitable for long distance
- 4) Door to Door Services is not available-
- 5) The Load Carrying Capacity is more

(QNO2) you are a transportation Engineering
 You have been tasked 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:- Being a Transportation engineer
 I will consider the following steps
 for office study of highway-

"Data Examination": It is the first step
 in which we examine all available
 data in which the road is to
 be constructed-

→ There is no use of photogrammetry.
 Investigation is this phase-

"Data Source":

- The data source are majorly
 available with National and
 provincial departments-
- Mostly the data is collected in
 form of-
- Maps.
- Aerial photographs.
- Charts -
- CAD visuals-
- Existing engineering projects e.g
 dams
- The type of data to be collected is
 dependent on the highway type-

"Topography of Data Collection"

- 1) Engineering include geology, climate and Traffic volumes-
- 2) Social and Demographic includes Land use and zoning pattern
- 3) Economic including unit Cost for Constructin and the trend of agricultural, Commercial and Industrial activities-
- 4) Environmental includes Type of Wildlife location of recreational and historical sites effect the air, noise and water pollution-

"Preliminary Analysis of Data:-"

- 1) It will indicate if any specific sites should be excluded from consideration-
- 2) At the completion of this phase the engineer will be able to select generally areas through which highway can traverse-
- 3) In the presence of any historical archeological sites the routes that tranverse it is excluded from further consideration

(11)

QNO3:- what is the importance of vehicles performance in highway design?

ANS:- The vehicle performance in highway design is very important because of following points-

- 1) Adequate sight passing and stopping sight distance-
- 2) Maximum grades-
- 3) Acceleration and deceleration lanes-
- 4) Timing of signalized intersection-
- 5) Braking characteristic also effect vehicle performance-
- 6) Climbing or passing lane-
- 7) Freeway lamps-
- 8) Setting Speed limit-

QNO5:- Explain broad Classification of Surface distances modes-

ANS:- Following are Classification of Surface distance mode-

- 4) "Disintegration" - This is in the form of stripping or removal of paving materials which can result from such things as loss of bonding and chemical activity. Traffic abrasion aggregate degradation or binder aging.

(5)

2) **Distortion**: This is in the form of deformation which can result from such things as excessive loading, densification or subgrade issue.

3) **Fractures**

These could be in the form of cracking or breaking, generally due to excessive loading and thermal changes.

QND 6) Explain Alligator Cracking, block Cracking longitudinal cracking and Transverse Cracking?

1) **Alligator Cracking**: Alligator Cracking is a series of interconnecting cracks caused by fatigue failure of an asphalt surface under repeated traffic loading. The cracks initiate from the bottom of the asphalt surface where tensile stress and strain is highest under a wheel load.

(6)

2) "Block Cracking"

Block Cracks are interconnected cracks that divide the pavement into approximate rectangular pieces. Block range in size 1 by 1 foot to 10 by 10 feet. Its caused by shrinkage of the asphalt concrete and diurnal temperature.

3) "Longitudinal Cracking"

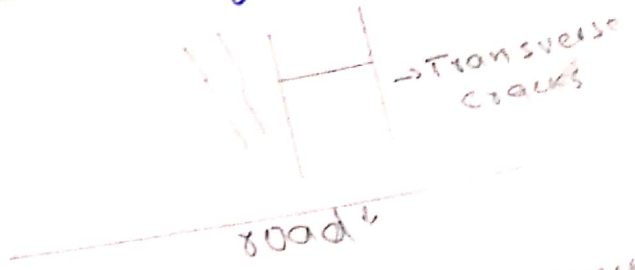
Longitudinal cracks are parallel to the pavement's center line or laydown direction. Caused by poorly constructed paving lane ~~point~~ joint the shrinkage of AC surface due to low temperature of the asphalt.

4) "Transverse Cracking"

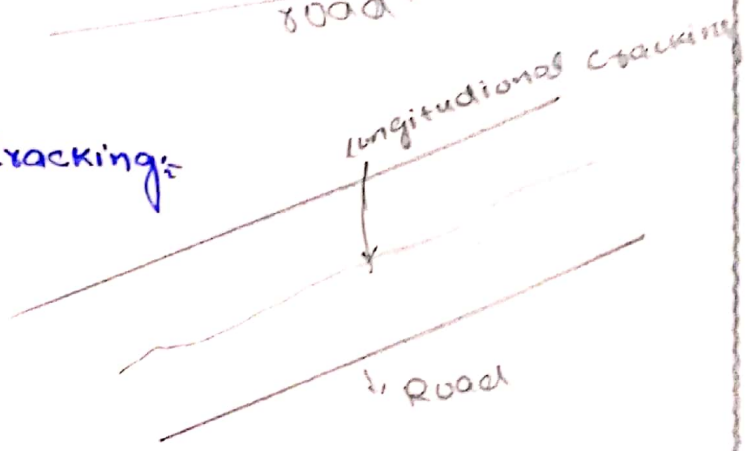
Transverse cracks extend across the pavement at approximate right angles to the pavement center line or direction by lay down. These type of cracks are not usually load associated.

(7)

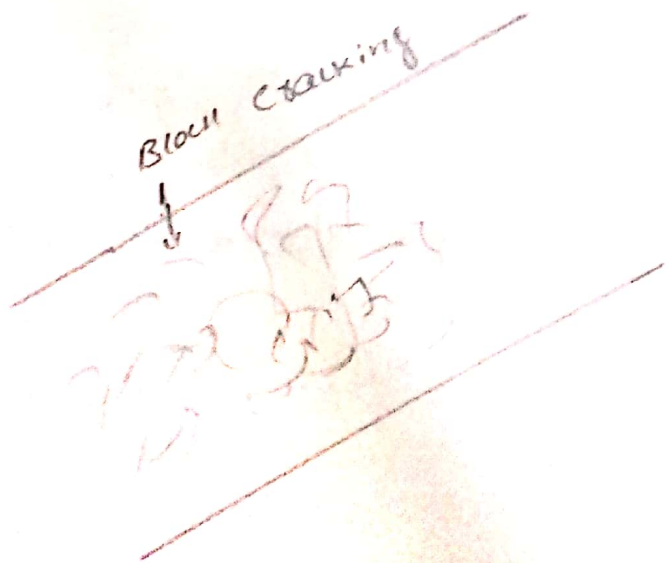
~~Transverse~~ Transverse Cracking



Longitudinal Cracking



"Block Cracking"



⑧

QNO4) Write Short Note on Directional Distribution in design of Highway?

“Directional Distribution”:- Highway must be design to adequate serve the peak-hour traffic volume in the peak direction of flow in Directional Distribution the total traffic hourly in both directions is used to design two lane roads - in the design of highway with more than two lanes and on two lane roads where important intersection are encountered or where additional lanes are to be provided later knowledge of the hourly traffic volume for each direction of travel is essential

“Example”:- If 80% of the DHV is in one direction at least three lanes in each direction would be needed for the 3200VPH