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Section B

Subject Transportation II

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Mid Term Examination

Question no 1:

(1)

Keeping in view different modes of transportation compare railway with highway.

Answer:-

RAILWAY

- (i) Passenger and Goods (Freight train).
- (ii) It depend on road service.
- (iii) Energy required to drag unit load is $\frac{1}{5}$ of that required by road
- (iv) Maximum safety i.e. minimum crash rate.
- (v) It require high investment
- (vi) Rail is depend on road services.

HIGHWAY

- Car, Bus, Truck etc
- It provide door to door service.
- Fuel consumption for unit load is high.
- High degree of accident due to flexibility of movement
- It require small investment.
- Other modes depends on it.

Question 2 :- (2)

You are a transportation engineer. You have been tasked to conduct office study as a preliminary step for design of new highway what reference material will you study and what will you extract from it?

Answer:-

Office study of Existing Information:-

Data Examination:-

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

Reference material to be studied:-

- Existing engineering reports.
- Maps
- Aerial photographs
- charts

③

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

Characters of Area:

- Engineering including, topography, geology, climate and traffic volumes.
- Social and demographic, including land uses and patterns.
- Economic, including unit cost for construction and the trend of agricultural, commercial, and industrial activities.

Extraction of Data:-

I will extract following data from it.

- Any specific site should be excluded from further consideration.

For example:

If it is found that a site of historic and archeological importance within an area.

⑤

Question 3:-

what is the importance of vehicle performance in highway design?

Answer:-

Vehicle performance is important in highway design because.

Acceleration and deceleration.

Climbing or passing lane.

Maximum grades

Freeway ramps

Setting speed limit

Adequate passing and stopping sight distance.

being considered ⁽⁴⁾ for possible route
Location.

Deforestation should be avoided.
Those route will be selected for
which cost is minimum.

Routes which give facility to
more people will be adopted.

(6)

Question 4:-

Write short note on Directional distribution in a design of highways.

Answer:-

Directional Distribution:-

- Total hourly traffic in both direction is used to design two lane road.
- Highways must be design to adequately serve the peak hour traffic volume in the peak direction of flow.
- Directional traffic is used for multilane roads and streets.
- Typically, one directional contributes by 55-70% is total traffic although occasionally 80% is observed.

Example:-

Consider a rural road with design volume of 4000 vehicles per hour for both direction of travelling.

⑦

- If during the design hour, the directional distribution is equally split or 0000 vph in one direction, two lanes in each direction may be adequate.
- If 80% percent of DHV is in one direction at least three lanes in each direction would be needed for the vehicles.

$$DDHV = AADT \times k(\text{Peak hour}) \times D$$

(Peak dir-flow).

⑧

Question 5 :-

Explain broad classification of surface distress modes?

Answer :-

Surface distress is "Any indication of poor or unfavorable pavement performance or sign of impending failure, any unsatisfactory performance of a pavement short failure.

Surface distress can be broadly classified into following three groups.

- (i) Fracture
- (ii) Distortion
- (iii) Disintegration

Question no 6:- ⁽⁹⁾

Explain the following

Answer:-

Alligator Cracking:-

Chicken wire cracking, spider web cracking, map cracking etc.

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

Occurs in area subjected to repeated traffic loading.

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

Block Cracking:-

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

⑩ Longitudinal Cracking:-

. Possible causes:-

Expansion and contraction of pavement material.

road bed settlement poorly constructed joints.

Transverse Cracking:

Causes:-

Slab longer than required Excessive thermal stresses.

Cures:-

Crack sealing

Dowel bar retrofit

Full depth rigid repair.