Assignment:

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Subject: Highway and Transportation

Question NO: 1

In terms of movement of people, which mode of transportation is most common in Pakistan? What can be done to improve the standard of transportation in Pakistan?

Transportation:

Public conveyance of passenger or goods especially as a commercial enterprise.

Types of Transportation:

1. Road Transportation
2. Rail Transportation

3. Maritime Transportation
4. Air Transportation

Transportation in Pakistan:

In Pakistan, the transport system broadly consists of **Roads**, railways, air transport and ports & shipping services. **Roads** are the most common and important segment of infrastructure in Pakistan. The rapid development and economic wellbeing is dependent on the **road** networks. The **Road** network in **Pakistan** carries over 96% of inland freight and 92% of passenger traffic are undoubtedly the backbone of the economy.

Improvement of the standard transportation in Pakistan:

- Create incentive for companies to give employees the option to work from home. The incentive can be in the form of tax breaks to those companies. Less people on the road means less traffic.
- Update all traffic signals in Pakistan to include 21st century traffic signal architecture.
- Design streets for each mode of transportation.
- We need to repair the roads in our cities and need to construct the road in village for trade and other purposes.
- We need to provide online taxi system this will reduce our traffic problem.
- Banned all the old and unregistered local vehicle.

Question No:2

Find the steepest gradient on 2 curve for meter gauge line with a ruling gradient of 1 in 200.Also briefly describe the step by step process of building of railway track in your own words?

Solution:

Ruling gradient =1 in 200 =0.5%

Compensation of a 2 degree curve = 0.03✖2 = 0.06%

C0mpensated gradient =0.5- 0.06 =0.04

How To Build A Railway Track:

There few steps to construct the railway track:

- **The subgrade drainage:** This is the system which is used to prevent the railway from water logging. The subgrade, road bed and slope of railway track are very easy to be washed by water.

- The preparation of construction materials is another work before track laying. Ordinary materials include railway sleepers, steel rail, rail fasteners and some construction equipment.

- Now laying the bottom ballast.

- Fix railroad spike to railway sleeper.

- Laying the steel rail, when steel rails are placed, connector them and railway sleepers by the rail fastening system and rail components like rail joint.

- Now spread the top ballast on the track.

- Now we provide the rail anchor which is used to prevent track from crawling.

Question No: 3

For a runway to be constructed at Bacha khan international airport, the following data was given?

- Airport elevation... R.L =100
- Airport reference temperature… 30 degree
- Basic length of the runway… =506
- Highest point along the length… R.L =98.2
- Lowest point along length… R.L =95.2

Calculate the actual length of runway?

Solution:

Correction of elevation:

The basic length is to be increased at rate of 7% per 300m elevation above mean sea-level.

Correction for elevation} $506 \times \frac{7}{100} \times \frac{100}{300} = 11\text{m}$

Length of runway after correction for elevation} = (506+11)

= 517m

<u>Correction for temperature:</u>

Standard atmospheric temperature at mean sea level} = 15˚c.

Taking the temperature gradient as equal to 6.5˚c per 1000m rise in elevation, the standard temperature at the airport site will be;

Temperature at R.L 100 $= 15 - [6.5 \times \frac{100}{1000}] = 14.35$˚c.

Difference between airport reference temperature and standard atmospheric temperature} = (30 – 14.35) = 15.65˚C.

<u>Applying correction at rate of 1% for every 1˚C,</u>

Correction for temperature $= [\frac{1}{100} \times 517] \times 15.65$

$= 80.91$ say 80m.

Corrected runway length = (517+80) = 597m

Effective gradient $= \frac{R.L\ 98.2 - R.L\ 95.2}{506}$

$= \frac{3}{506}$ OR 0.59%

Applying correction for the effective gradient at the rate of 20% for each 1% effective gradient.

$$\text{Correction for gradient} = [\frac{20}{100} \times 597] \times \frac{0.59}{1}$$

70.46, say 70m.

Actual length of runway = (597+70) = 667m…..Answer