

Summer-20 Final Paper

Name

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ID

7807

Section

A

Subject

Transportation-I

Submitted To

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Q11

Given data

vehicles monthly 60000.

Peak flow rate of 150 vehicles @ 15 min

Required:

No. of vehicles moving ^{lane per} per hour
in each direction?

Peak hour ~~factor~~ (PHF) = ?

Solution:

60000 vehicles moves in 30 days

So vehical per day - $\frac{60000}{30} = 2000/\text{day}$

Now

Per hour = $\frac{2000}{24} = 83.3 \approx 84 \text{ veh/hr}$

Consider three lanes in each direction

So total six lanes for both direction.

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$$\text{So } \frac{84}{6} = 14 \text{ vehicles.}$$

Hence 14 vehicles are moving per lane per hour in each direction.

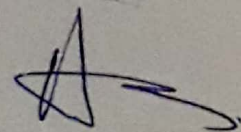
Find Peak hour factor (PHF):-

$$\text{PHF} = \frac{\text{Hourly vehicles}}{4 \times \text{minimum 15 min volume within hour}}$$

$$= \frac{14}{4 \times 550}$$

So

$$\boxed{\text{PHF} = 0.00636}$$



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Q:- 21 Calculate PMS & SMS
from the given data:-

Ans:- Solution:-

Conversion of units

| Vehicle number | Distance to (km) | Time to (hour) | Speed km/hr. |
|----------------|------------------|----------------|--------------|
| 1 | 1.400 | 0.02183 | 64.122 |
| 2 | 1.400 | 0.025167 | 55.629 |
| 3 | 1.200 | 0.01850 | 64.865 |
| 4 | 1.500 | 0.0150 | 100.00 |
| 5 | 1.600 | 0.01866 | 85.714 |
| 6 | 1.800 | 0.0253 | 71.053 |
| 7 | 1.200 | 0.02416 | 49.655 |
| 8 | 0.950 | 0.01500 | 63.333 |
| 9 | 1.175 | 0.002216 | 53.008 |
| 10 | 1.200 | 0.01883 | 63.717 |
| 11 | 1.300 | 0.02168 | 60.000 |
| 12 | 1.400 | 0.02000 | 70.00 |
| 13 | 1.800 | 0.02066 | 87.097 |
| 14 | 1.700 | 0.0185 | 91.892 |
| 15 | 1.800 | 0.016667 | 108.000 |

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| | | | |
|---------|--------|----------|----------|
| 16 | 2.100 | 0.018667 | 112.500 |
| 17 | 1.200 | 0.01450 | 82.759 |
| 18 | 1.700 | 0.02333 | 72.857 |
| 19 | 1.600 | 0.020166 | 79.339 |
| 20 | 1.700 | 0.009166 | 185.455 |
| Total | 29.525 | 0.572168 | 1620.995 |
| Average | 1.4762 | 0.028608 | 81.0497 |

For Time mean Speed (TMS)

$$TMS = \sum_i \left(\frac{x_i}{t_i} \right)$$

$$= \frac{1620.995}{0.572168}$$

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$$TMS = 141.6498 \text{ km/hr}$$

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For Space mean Speed (SMS)

$$SMS = \frac{n}{\sum_i (t_i/n)} = \frac{n \cdot n}{\sum_i t_i}$$

$$= \frac{20 \times 1.47625}{0.572168}$$

$$SMS = 51.6019 \text{ km/hr}$$

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Q: 31 Railway Engineering:-

The Branch of Civil Engineering which deal with the designing, planning, construction, operation and maintenance of the railway tracks for safe and efficient movement of train is called railway Engineering.

Railway Engineering is a specialist field in Transportation & Civil Engineering.

Railways are incredibly complex and expensive systems which are exclusively designed for the efficient passage of trains to transport people.

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Railway Engineer posses mechanical design skills and knowledge of propulsion system that allow them to design train vessel.

Primary objectives of Railways Engineering are Safety & Efficiency.

History

History of railway is closely linked with the development of civilization.

⇒ In 1769, Nicholas Carnot, a Frenchman, carried out the pioneering work for developing Steam Energy.

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- ⇒ In 1804, Richard Trevithick designed & constructed a steam locomotive.
- ⇒ This locomotive, however, could be used for traction on roads only.
- ⇒ The credit of perfecting the design goes to George Stephenson who in 1814 developed the first steam locomotive used for traction on railways.
- ⇒ The first public railway in the world was opened to traffic on 27th Sep, 1825 b/w Stockton & Darlington in UK.
- ⇒ The US operated its first railway line b/w Troy & Hudson in 1833.

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⇒ It was on 13 May, 1861 that first railway line was opened for public traffic b/w Karachi city & Kotri, The distance of 105 mile (169 km).

⇒ Speed was 12 mph

⇒ Speed is 375 mph.

Q: 41 Airport Engineering :-

Airport Engineering engineering encompasses the planning, design, and construction of terminals, runway and navigation aids to provide safe movement of for passenger and freight service.

⇒ In Airport Engineering must use the analysis of predominant wind direction to determine runway orientation, determine the size of runway border and safety areas, different wings.

⇒ An Airport is facility where passenger connect from ground transportation to air transportation.

⇒ Air field :- This is an area where an air craft can land and take off, which is equipped with any navigational aids, markings and terminals facilities.

⇒ Aerodromes :-

This is a defined area on land or water (including any buildings, installation and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

History :-

⇒ The world first airport was built in 1928 at Croydon near London. (England)

⇒ 1903 - First successful flight by Wilbur & Orville wright at Kitty Hawk, North Carolina

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- 1912 → Flight b/w Delhi & Karachi.
- 2006 → Air bus A 328 made first flight which is biggest passenger airline of 800 persons.

Component of Airport:-

1- Runway:-

Runway is a paved land strip on which landing and take off operations of aircraft takes place. It is levelled position without any obstruction on it.

2- Taxiway:-

Taxiway is path which connects each ~~and~~ end of the runway with terminal area, apron, hanger etc.

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⇒ These are laid with asphalt or concrete like runway.

3- Apron :-

Apron is place which is used as parking place for aircrafts. It is also used for loading & unloading of aircrafts. Apron is generally paved and is located in front of terminal building or adjacent to hangars.

4- Terminal Buildings :-

This is the place where airport administration facilities take place. In this building, pre journey and post journey checkings of passengers take place.

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5- Control Tower:-

The control tower is a place where air craft under particular zone is controlled whether they are in land or in air. The observation is done by the Controller through radars and information is carried through radio.

6- Hangers

Hanger is a place where repairing and servicing of air craft is done.

Taxiway is connected with Hangers.

7- Parking

This is a place provided for parking the vehicles of airport staff or passengers which is outside the terminal buildings.