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IOARA National University Peshawar
Assignment/Quiz (Summer - 2020)

Name : Salman Khan

I.D : 5865

Instructor : Engr. Masvan
Raza

Subjects : Highway and
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Engineering

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{ A student is nothing
without teacher. }

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Q.No. 01. Write a detail note on modes of transportation.

Ans

Modes of transportation

Transport modes are designed to either carry passengers or freight, but most modes can carry a combination of both. For instance, an automobile has a capacity to carry some freight while a passenger plane is used for luggage and cargo.

① Road Transportation

Road infrastructures are large consumers of space with the lowest level of physical constraint among transportation modes. However, geographical constraints are significant in road construction with substantial additional costs to overcome features such as rivers or rugged terrain. Road transportation has an average operational flexibility as vehicles can serve a purpose but are rarely able to move outside roads. Road transport systems have high maintenance costs,

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(ii) **• Rail Transportation •**

Railways are composed of a fixed path on which wheeled vehicles are bound. In light of more recent technological developments, Rail transportation also includes monorails and maglev. They are linked to types of locomotives and a low gradient is required particularly for freight. Heavy industries are traditionally linked with Rail transport systems, although containerization has improved the flexibility of Rail transportation by linking it with Road and Maritime modes. The Land transportation mode offering the highest capacity with a 23,000 tons fully loaded coal unit train being the heaviest load ever carried.

iii **• MARITIME TRANSPORTATION •**

Maritime transportation is the most effective mode to move large quantities of cargo over long distance. Main maritime routes are composed of oceans, Coasts Seas, Lakes, Rivers and Channels.

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Maritime transportation has high terminal costs, since port infrastructures are among the most expensive to build, maintain and improve. More than any other mode, maritime transportation is linked to heavy industries, such as steel and petrochemical facilities adjacent to port sites.

◦◦ Air transportation ◦◦

Air Routes are practically unlimited. Air transport constraints are multidimensional and includes the side. Commercial plane needs about 3300 meter of Runway for landing and takeoff. The climate, fog and aerial current. Air activities are linked to most notably finance and tourism, which lean on the long distance mobility of people. More recently air transportation has been accommodating growing quantities of high value freight and is playing a growing role in global logistics.

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Q.No. 2

(a)

What is Coning of a wheel in Rails and write its advantages and Disadvantages.

Ans =

Coning of wheel

The rim or flanges of the wheels are never made flat but they are in the shape of a cone with a slope of about 1 to 20. This is known as Coning of wheels.

The coning of wheels is mainly done to maintain the vehicle in the central position with respect to the track.

When the vehicle is moving on levelled track then the flanges of wheels have equal circumference but when the vehicle is moving along a curved path then in this case the outer wheels has a tendency to move sideways towards the outer rail, the circumference of the flanges of the inner wheel and this will help the outer wheel to cover longer distance than the inner wheel. In this way smooth riding is produced means coning wheels.

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Advantages Coning wheels

- ⇒ Coning the wheels reduces the depreciation of the wheel tines and rails. Depreciation is caused because of the friction action of tines with inner faces of the rail top.
- ⇒ Coning also prevents, to some extent, the slipping of the wheels.
- ⇒ Smooth riding - Helps vehicle to negotiate curves smoothly

Disadvantages

i) The pressure on the horizontal component of force near the inner edges of outer rail has a tendency to wear the rail quickly.

The horizontal component has to turn the rail outwards and hence the gauge may be widened.

If no base plates are provided, sleeper under the outer the outer edge of the rail may be damaged.

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5865D.No. 02
(B)Write a brief note on
types of Rails.

Ans =

types of Rails

Rails can be divided into three types

- i) Double Headed Rails.
- ii) Bull Headed Rails.
- iii) Flat Footed Rails.

ii) Double Headed Rails :

These are rails indicate the early stages of development. It essentially consists of three parts.

Upper Table, Web, Lower Table.

Both the upper and lower tables were identical and they were introduced with the hope of doubling the life of Rails. When the upper table is worn out then the Rails can be placed upside down reversed on the chair and so the lower table can be brought into use.

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Bull Headed Rails

This type of Rail also consist of three ty

The Head, The web, The foot.

These rails were made of steel. The head is of larger size than foot and the metal in the foot is sufficient to bear the stress caused by moving wheels. Their weight ranges from 85 lb to 95 lb and their length 60 ft.

Flat Head Rails

These rails were first of all invented by Charles Vignoles in 1886 and hence these rails are also called Vignoles Rail. It consist of three parts.

The Head, The web, The foot

The foot is spread out of form a base. This form of rails has become so much popular that about 90% of railway tracks in the world are laid with this form of rails.

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03.00 Write an important component of Airport Layout in detail.

Ans

Important Components of Airport Layout.

- i) Runway, ii) Terminal Building,
- iii) Apron, iv) Taxiway, v) Aircraft Stand,
- vi) Hangar, vii) Control tower, viii) parking

12 Runways:

A Runway is the area where an aircraft lands or takes off. It can be grass, or packed dirt or a hard surface such as asphalt, or concrete. Runways have special marking on them to help a pilot in the air to tell that it is a runway and to help them when they are landing or taking off.

Runway markings are white. Most runways have numbers on the end. The number is the runway's compass direction, R for Right, C for Center, L for Left.

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Left.

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Terminal Buildings:

Also known as airport terminal, these buildings are the spaces where passengers board. These buildings have all the necessary facilities for passengers to check-in their luggage clear the customs and have lounges to wait before disembarking. The terminal can house cafes, lounges and bars to serve waiting area for passengers.

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APRONS:

Aircraft aprons are the areas where the aircraft park. Aprons are also sometimes called ramps. They vary in size, from areas that may hold five or ten small planes, to the very large areas that the major airports have.

Control Tower

A tower at an airfield from which air traffic is controlled by radio and observed physically and by radar.

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TAXIWAY

A taxiway is path on the airport connecting Runways with Ramps, Trainers, Terminals and other facilities. They mostly have hard surface such as asphalt or concrete, although smaller airports sometimes use gravel.

AIRCRAFT STAND

A portion of an apron designed as a taxiway and intended to provide access to aircraft stand only.

Hanger

A hanger is a closed building structure to hold aircraft or spacecraft. Hangers are built of metal, wood. Hangers are used for protection from the weather, maintenance, repair, manufacture, assembly and storage of aircraft.