Chapter - 10

World : Transport and Communication

Transport is an important economic activity run by man. In the three level classification of economic activities, transport is included under the tertiary activity. The transfer or movement of goods and people from one place to another by means of any physical medium is called transport. Normally, transport means the services or facility of carrying people and goods from one place to the other in which people, animals and different kinds of vehicles are used. Such movement is possible by land, water and air routes.

In the same way, the spatial give and take of message, thoughts, etc. is called communication. Transport and communication are put in a combined form under 'circulation'. In this way, transport is an important part of circulation. Various means of transport are used in different parts of the world which have their specific distinct technical features and regional expansion patterns. The modern means of transport may be put under three broad categories-

1. Land (Roads and rail routes)
2. Water
3. Air

Other pipelines (water, oil and gas)

The regional pattern of the transport system of any state is called the transport network. In this way, the entire transport system of any state represents the three different kinds of means of transport in a combined form.

Transport is a productive activity by means of which income is earned in the form of remuneration for carrying goods and passengers from one place to another. The production value of transport is received in the form of freight and fare. The routes for transport are fixed which pass through water, land and air called water routes, land routes and air routes respectively. The water routes pass through any lake, rivers or sea (or ocean). The transport through water routes is by boats, steamer, ships, etc. Roads and rail routes come under land routes. Small vehicles from rickshaw, tonga to bus, taxi, truck, etc. are included in the means of transport moving on the road. On the rail routes, passengers and goods are transported by means of passenger trains and goods trains respectively. Aeroplane, helicopter, etc. are the major means of air routes.

Along with the reform in transport, there is an important development in the means of communication. The incoming-out-going of business messages are being facilitated with the help of telegraph, telephone, wireless, radar, automatic computers and has also assisted the trains, ships and aircrafts to complete their journey. The places located at a long distance on the earth have now become closer.

Land Transport

Land transport can be divided into two major parts- (i) Road transport (ii) Rail transport. Although both roads and railways are of great importance in transportation of passengers, but the rail-routes are more important means from the business view point.

(i) Road Transport

The majority of the goods and services are mainly circulated on the road. In the early days, man was himself a carrier. In the later years, animals were used to carry load. With the invention of wheels, the use of vehicles and cargo became important. The revolution in transport came after the invention of the steam engine in 18^{th} century. Pipelines, highways and cables are included as the latest development in land transport.

Under the road routes, from the usual trails to the proper roads for the motor vehicles are covered. For covering a short distance, road transport can be used for carrying the goods from production centres to the consumer centres. Roads are also made in remote mountains areas. Under the transport, simple means like bullock carts, tonga, bicycle, rickshaw, etc. and automatic vehicles like motor-cycle, scooter, motor-car, bus, truck, trolley, etc. all move on the roads and are helpful in the transfer of passengers and goods.

Generally, old and early forms like human porters, stocking animals vehicles, or freight containers were the most expensive means of transportation, while large cargos are cheap. They, have great importance in providing complementary to modern waterways and cargo in the internal parts of large countries. Even in the densely inhabited districts of India and China, there is a culture of human porters and vehicles pulled by man.

Roads :- Roads are of two types : 1. Unmetalled Roads 2. Metalled roads

The unpaved roads are generally found in the rural areas of developing countries. The gravel roads are made strong with pebbles concrete, stone, etc. and on top, it is made smooth using asphalt or other materials. Unpaved roads are simple in view of construction and not all unpaved roads are effective and usable. In the rainy season, motor vehicles cannot be run on them and even gravel roads are severely affected during heavy rainfall and floods.

There is considerable difference in the quality of roads in developed and developing countries because the cost of construction and maintenance of roads are huge. Good quality roads are found everywhere in developed countries, and the motorway for fast moving vehicles connects highways and state highway.

Table 10.1 : Length of Roads

S. No.	Country	Length	Express Highway km
1.	United States of America	65,86,610	1,03,027
2.	India	48,65,00	1,324
3.	China	45,00,000	1,23,000
4.	Brazil	17,51,868	11,000
5.	Russia	13,96,000	929
6.	Japan	12,15,000	8050
7.	Canada	10,42,300	17,000
8.	France	10,28,446	11,882
9.	Australia	8,23,217	3132
10	SouthAfrica	7,47,014	1,400

Source : Encyclopaedia 2016

Highway

Highways are gravel roads connecting distant places. They are constructed in such a way that the flow of traffic goes on in uninterrupted way. In order to facilitate the uninterrupted flow of traffic, these are 80 metres broad roads with different lanes, bridges, flyover's and double lane ways. Each city and port in the countries of the world are connected by highway.

Major Road Routes of the World

1. Pan-American Highway : It is the longest

road of the world which connects the countries of South America to Central America, Mexico and the United States of America. This highway Startes from northwest of Alaska and ends in Brasilia (Brazil) passing through Santiago (Chile), Buenos Aires (Argentina).

2. Trans : Canadian Highway - This highway connects Saint John city of New Foundland Province to Vancouver city in British Columbia on the western coast.

3. Alaska National highway : This highway connects Edmonton city of Canada to Anchorage city of Alaska.

4. Stuart Highway : This highway connects Birdum in North Australia to Unadutta in South Australia via Alicespring.

The density of highways is high in America which is approximately 0.65 km. per sq km. Every place is located 20 km away from highway. There are 63 lac km long roads in America which is the highest in the world. The majority of roads are located in the eastern part of United States. Around one-third roads (length) and half of the motor vehicles of the world are found in the U.S.A. Due to excessive industrialization and urbanization in the eastern part, there is a network of roads.

Due to the diversity in land forms in the African continent, roads are the most important means of transport. A large number of vehicles and well developed network of highways is found in Europe. But the highways have to face tough competition with the rail routes and water routes.

In Russia, an excessive dense network of highways has developed in the industrial region located in the west of Ural, the axis of which is Moscow. The important Moscow-Vladivostok National highway serves the region located in the east. Due to large extent of geographical area, there are not so many highways in Russia, as rail routes.

Roads are the major means of transport in China, which have a network spread in the plain areas of the eastern part. There are approximately 15 lac km long roads in China. Here the highway criss-cross joining the major cities in the country. They connect shanso (near the Vietnam border), shanghai (central China), Guangzhou (south) and North Beijing with each other. The recent higway connects Chengdu in Tibet to Lhasa.

There are many national highways in India also. In terms of the length of gravel roads 44.6 lac km. India stands at the 3rd position in the world. Unpaved and gravel, length of all kinds of roads is 33 lac km. The roads highways in India have been divided into National, State highways and District roads. There are total 230 major national highways (N.H.) in the country. The longest N.H of the country is NH-7 which connects Varanasi to Kanyakumari. The four big metropolitans have been joined in the Golden Quadrilateral plan.

In the corridor plan, the north-south and east-west have been joined in which in the east Silchar in Assam has been connected to the west, Porbandar in Gujarat. In the north corridor, Kashmir has been connected to Kanyakumari and the under-construction fast moving six lane, eight lane, national highways and green corridor highways are being constructed. The work of their construction and maintenance is done by the National Highway Authority of India (N.H.A.I.).

Border Roads

The roads built along the international borders are called Border roads. These roads play an important role in connecting the people living in distant remote areas to the major cities and to provide security. Generally, such roads are constructed in all the countries to carry the goods to the village and army-camps.

(ii) Rail Routes

Amongst land transport, the importance of rail transport is the most. The development of rail-routes occurred much later, as compared to the development of roads. In England, James Watt

invented the engine in 1769 and George Stephens invented the steam engine in 1814 for the first time. On September 27, 1825 the first train of the world started in England between Arcton of Northern England and Darlington. The breadth (gauge) of rail lines is different in each country. Generally, they are classified into broad guage (more than 1.5 metres), metre guage (1 metre) and narrow guage. The rail transport in India started in 1853 between Mumbai and Thane (34 kms.). The Indian Rail is operated in four lines (a) Broad gauge (width 1.676 metre) (b) Metre gauge (width 1 metre) (c) Narrow gauge (0.762 metre) and (d) Lift guage (0.610 metre). The use of Standard guage (1.44 meter) in the world is done in Britain.

The trains used for commuting are largely popular in Britain, the U.S.A., Japan, Russia and India. These daily trains carry lacs of passengers daily. There are approximately 13 lac km. long rail transport routes in the world.

The densest rail network of the world is found in Europe. Here the rail routes are approximately 121 thousand kms long amongst which, most are double or multi routes. The rail density is maximum in Belgium i.e., 1 km per 6.5 sq km. The industrial regions represent some highest densities of the world. London, Paris, Brussels, Milan, Berlin and Warsaw are important rail centres The tunnel route operated by the Euro tunnel group in England, connects London to Paris.

The western part of Ural mountain in Russia, has a dense network of railways, they influence 90% part of the total transport. On the basis of the length of rail routes (287 thousand kms), Russia has the third position in the world.

North America has the most extensive rail route network, which is 40 % of the total rail-routes of the world. In contrast to this, in many countries of Europe, the use of rail routes is done more for the transport of long distance freight materials like ores, grain, timber and machinery, etc. in comparison to passenger transport. The most dense rail-network is found in east-central U.S.A. and the adjoining high industrial and city area of Canada.

In Canada, the rail routes are in the public sector. There are two trans-continental rail routes in Canada (i) Canadian Pacific Railway. (ii) Canadian National Railway. The Canadian Pacific Railway starts from Halifax in the east and reaches Vancouver via Montreal Winnipeg. The Canadian National Rail route also goes from Atlantic coast (Quebec) to the Pacific coast (Prince Rupert). It's important mid stations are Winnipeg, Edmonton, Prince George, etc. The maximum wheat and coal is transported by menas of Trans-continental rail routes. The table 10.2 shows the length of the rail routes of the major countries in the world-

Table 10.2 : Length of Rail lines

S.No	Country	Length (kms)	Electrification
1.	United State of America	226,932	1600
2.	China	121,000	65,00
3.	Russia	87,157	50,000
4.	India	67,312	27,999
5.	Canada	46,552	129
6.	Germany	43,468	19,973
7.	Australia	38,445	2,715
8.	Argentina	36,968	136
9.	South Africa	31,000	24,800
10	France	29,640	15,140

Source : World Data Bank, 2015

Australia : Here the rail routes are found mainly in the south eastern parts. The total length of rail routes in Australia is 49 thousand kms, 25 % of which is found in New South Wales alone. West-east Australian National rail route goes from Perth from one corner to Sydney on the other corner. All the major sea ports of Australia i.e. Perth, Melbourne, Sydney, etc. are connected to their hinterland by rail routes.

In South America, the rail routes are dense in two regions, which are the Pampas of Argentina and

the coffee producing regions of Brazil. 40 % part of the total rail routes of South America is found in these two regions. Amongst the remaining countries of South America, Chile is the only country with considerable length of rail route, which connects the coastal centres to the mining places located in the interior areas. Short single route rail lines are found in Peru, Bolivia, Equador, Columbia and Venezuela.

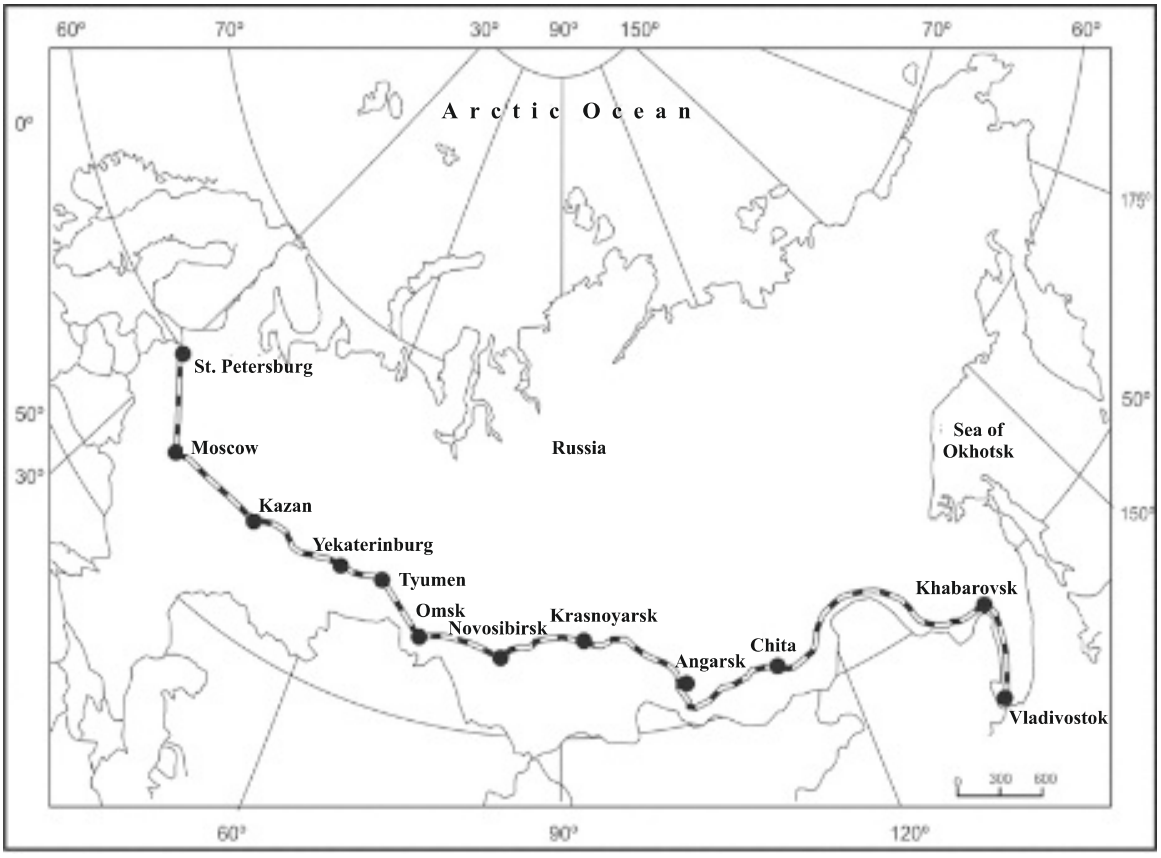
Here, there is only a trans-continental rail rout which passes through the Usplata pass located at a height of 3900 meters across the Andes Mts. and connects Buenos Aires (Argentina) to Valparaiso.

In Asia, the highest density of rail routes is found in the densely populated regions of China, Japan and India. In other countries, comparatively lesser rail routes have been built. Deserts and regions of scarce population have minimum development of the rail facilities. India has the fourth place in the world and third in Asia. The length of rail routes is 67,312 thousand kms. The rail routes in India are much dense in the northern plains. The plateau region of the south has comparatively lesser rail routes. Africa, inspite of being the second largest continent, there are only 40,00 km. long rail routes in Africa, out of which 31000 kms are in South Africa alone due to the gold, diamond and copper mining activities.

Africa : (i) Benguela railways goes from Angola to the Katanga- Zambia copper belt. (ii) Tanzania rail route goes from Zambia copper belt to Dar-e-Salam located on the coast (iii) Crossing through Botswana and Zimbabwe the rail route connects the land locked states to the south African rail network (iv) The Blue train from Cape Town to Pretoria in South African Republic.

Major Railways of the World

(1) Trans-continental Railways : The transcontinental railways crosses the entire continent and joins its two corners. They have been constructed to provide the facility of long journeys in different conditions due to economic and political reasons.



Map 10.1 : Trans-Siberian Railways

Fig. 10.1 : Trans-Siberian rail route near Vladivostak

Fig. 10.2 : Trans-Siberian with the Volga River

Fig. 10.3 : Canadian-Pacific Railroute

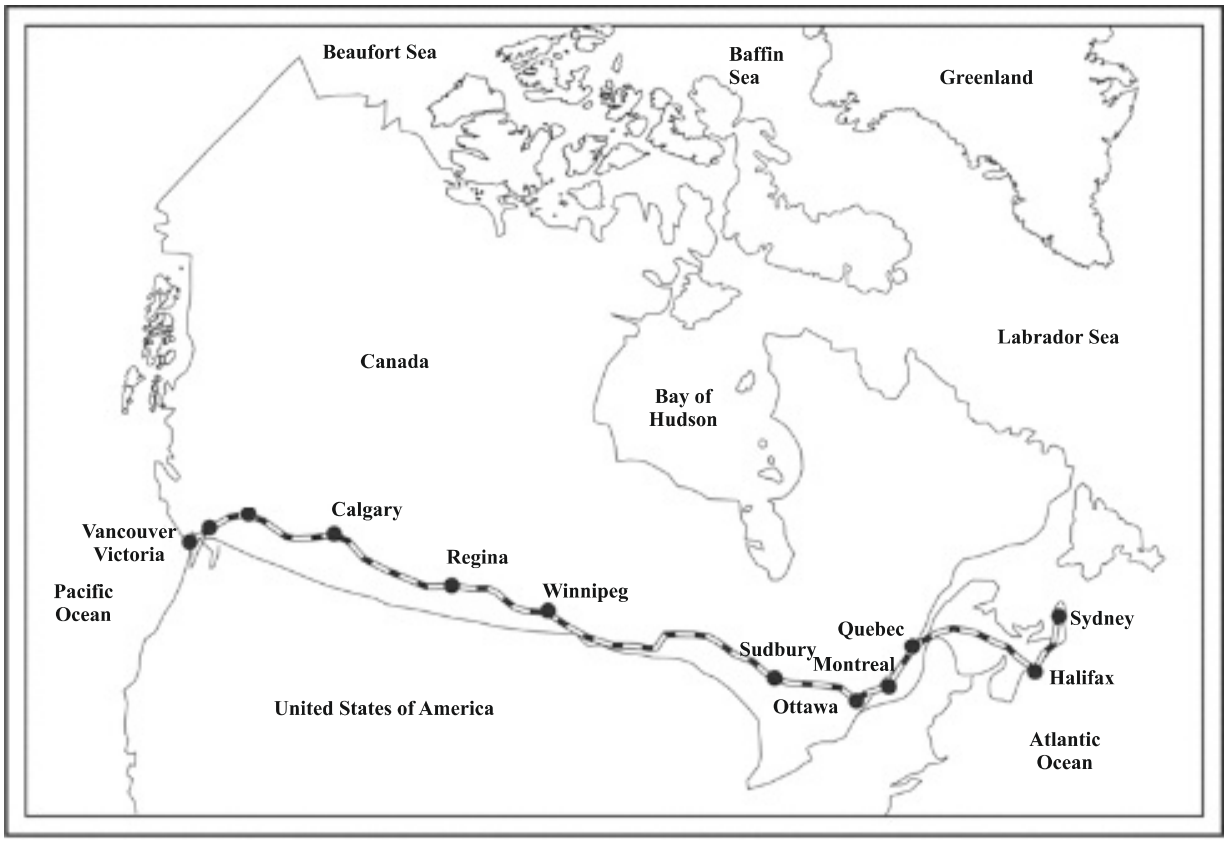
(i) Trans-Siberian Railways : It is the longest rail route of the world. It is 9560 km long from Leningrad city (Petersburg) located on the coast of Baltic sea in the Western part of Russia to Vladivostok city located on the coast of Pacific Ocean in the extreme east of Russia. Its construction started in the year 1891. It got ready in 1905 and in 1945 it was made double lane equipped with electrical lines. In trans-continental rail route, the trains can move from both sides uninterrupted. This rail-route goes across Siberia. It is known by the name of Trans Siberian railways. The map 10.1 shows the major centres of this rail route.

This rail route goes up to the capital of Russia, Moscow, which is also a major industrial city. Passing through Tula city ahead Moscow, Kuiveshev city on the banks of river Volga, crosses the Ufa city in the Ural region and reaches Viliyabinstu. From here, starts the Steppes where Omsk is an important centre.

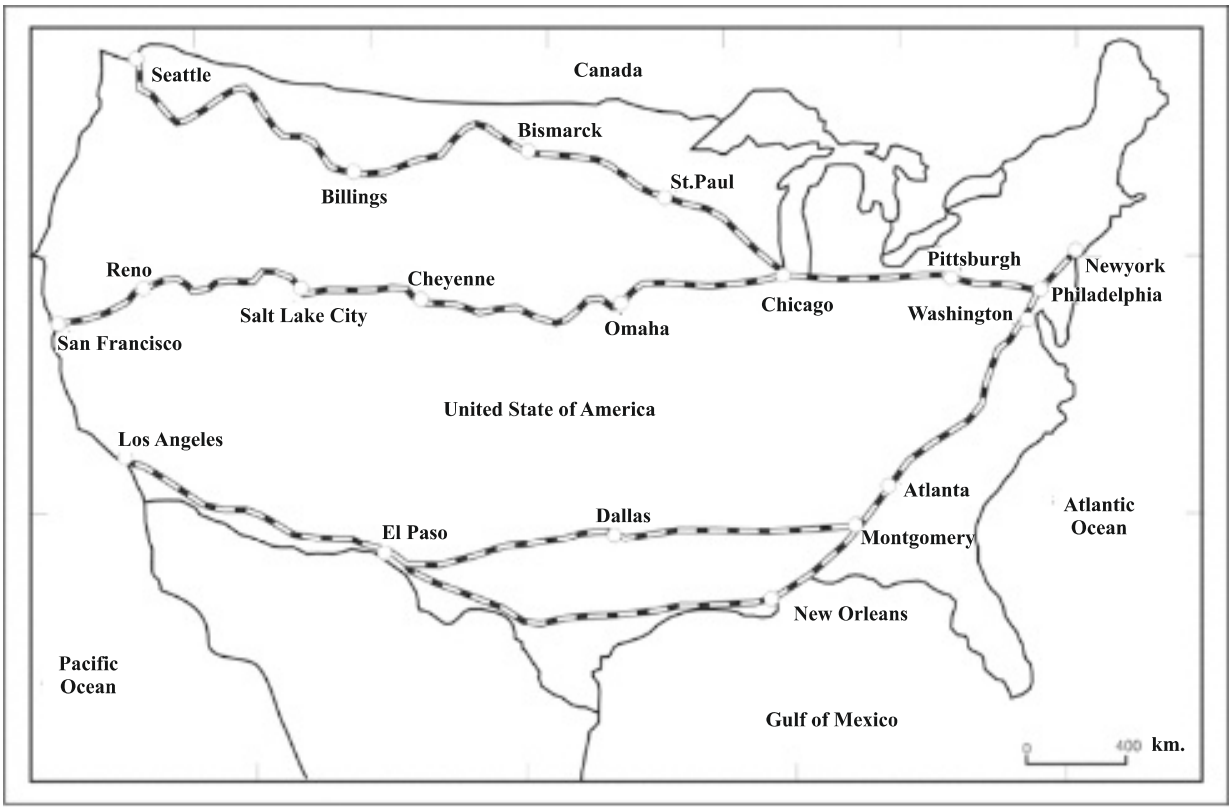
It connects the Asian regions to the west European market. This railways crosses through the Ural mts and Ural rivers. Cheeta is an important agricultural centre. This rail route has made possible the development of the economically backward Siberia.

(ii) Canadian Pacific Railways :

It is the most important rail-route of Canada, which is parallel to the border of the U.S.A. and near it, is 7050 km long from Atlantic coast to the coast of the Pacific Ocean. This rail route was built in 1886 under a treaty with the objective of including the British Columbia on the western coast into the union of states. Quebec-Montreal is industrial trade centre. (Map 10.2 shows the major centre of this rail route).



Map 10.2 : Trans- Canadian Rail route



Map 10.3 : Intercontinental rail route of United States

(iii) Inter - Continental Rail-Routes of the United States of America :

There are three major inter-continental rail routes in the U.S.A. which connects the New York Port and Main city located on the Atlantic coast to the Pacific coast ports of Seattle, San Francisco and Los Angeles. According to location, they are known by the names of North, Central and South Inter-continental rail routes. (Map 10.3 shows the rail routes of the U.S.A.)

(A) Northern Inter-Continental Rail Route :

This rail route starts from New York city located on the coast of Atlantic ocean in the Northern part of the U.S.A. and crossing Chicago, reaches Seattle at the continental shelf of Pacific Ocean. Its length is 6100 km. It is the longest and most important rail route of the U.S.A. The Pittsburgh City is on this route, which is a world famous centre of iron-steel industry. Heading towards the west from here, this rail route reaches the large Chicago Gary industrial area located on the south coast of the lake Michigan and north western and reaches the Bismark city located in the Prairie region in Saint Paul city. From here, crossing through the passes of the hills of Rocky Mts. and tunnels, this rail route reaches the Pacific coastal port Seattle. This route connects the north-western part of the U.S.A. to North- Eastern industrial area. Food grains (maize, wheat), iron-steel, machines, meat, fruits, wood, etc. are transported on this route.

(B) Central Inter - Continental Rail Route :

This rail route connects New York city to the famous Pacific coastal harbour San Francisco. This rail route is the same to inter-continental rail route till Chicago but its route changes from Chicago going towards the west from Chicago, this rail route reaches the Omaha city on the coast of river Missouri, from here enters the plateau region of the west passing through the valley of the Plat river and meets the Cheni city. Towards its west, it reaches the Salt Lake city passing through Inans pass of Rocky Mts. From here, starts the Green Valley of California. From Sacramento City this rail route ends reaching San Francisco city on the coast of Pacific Ocean.

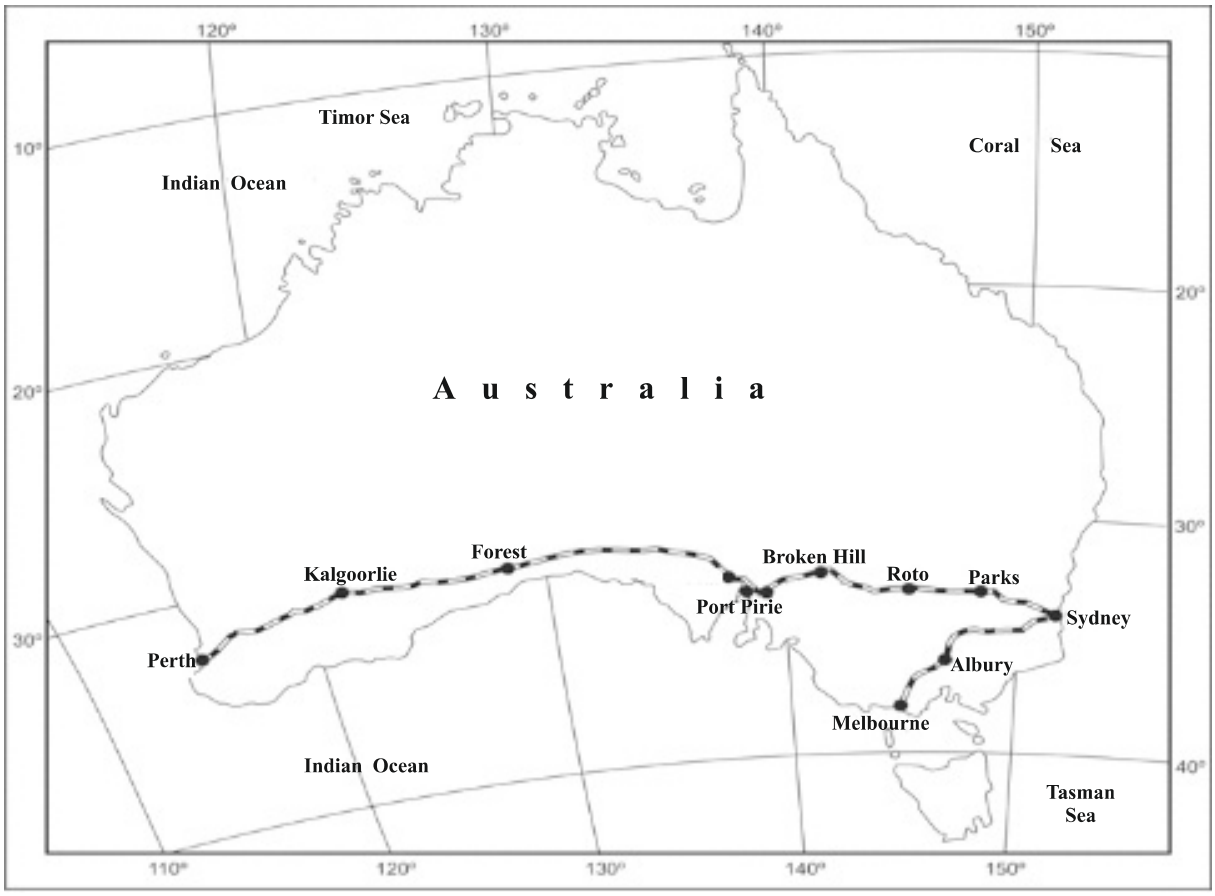
(C) South Inter - Continental Rail Route :

This rail route goes from NewYork via New Orleans to Los Angeles city on the coast of Pacific Ocean. This route passes through the major industrial belt of the U.S.A., due to which it has a specific importance. Los Angeles city is famous for film industry.

(iv) Australian Inter Continental Rail route :

This rail route goes from the southern border of Australian continent, from Sydney in the east to Perth port in the south-west. A difference in the width of rail routes (gauge) is found in many parts of this rail route.

Starting from the major harbour of Sydney located on the east coast of Australia, this rail route crosses the Great Dividing Range and reaches the Broken Hill city located on the coast of river Darling. From here, it reaches the port Augusta via Peter Buro and Port Pirie in the south-west progressing towards the west, this route goes through the world famous gold mining towns of Australia, Kalgoorlie and Coolgardie cities and reaches the famous sea port Perth located on the coast of Indian ocean. (Map 10.4)



Map 10.4 : Australian Transcontinental Rail route

(v) Orient Express Rail Route :

This line goes from Paris to Strasbourg, Munich, Vienna, Budapest and Belgrade to Istanbul. The major exports through this line are cheese, pork, oats, liquor, fruits and machinery.

There is also a proposal of constructing Asiatic railway to join Istanbul to Bangkok via-Iran, Pakistan, India, Bangladesh and Myanmar .

(vi) Cape- Cairo Rail Route :

This is a proposed intercontinental rail-route. Under it, there is a plan to connect the city and harbour of Cairo located on the northern corner of river Nile in Egypt in north-eastern part of Africa to the Cape Town located on the southern corner of South Africa through rail route. The length of this route will be 1400 km. In its south, the rail route goes from African capital Pretoria and reaches Cape Town and Kimberley (gold mine). Only the northern

Map 10.5 : Cape Cairo Rail route

Fig. 10.4 : Cape Cairo Rail route (in Johannesburg)

(Egypt and Sudan) and the southern (Zimbabwe and South Africa) parts of the proposed Cape-Cairo Rail Route is constructed, whereas the central part is without any rail route. Due to dense forests and uneven mountainous region and excessive backwardness, the means of land transport are totally undeveloped in this part. On completion of the proposed Cape-Cairo Rail Route, the African lands from the north to the south will be united and it will be helpful in economic development.

(iii) Water Transport :

Amongst all means of transport, water transport is the cheapest and easily available. The water routes pass through rivers, lakes, canals and oceans. No special expenditure is to be done for the construction of waterways, but only small amount is spent on construction of ports and harbour, and to deepen and keep the water routes safe. Boats, steamer, ships etc. are the major means of water-transport. Generally, ships are used for carrying cheap and heavy materials, coal, iron-ore, iron steel, cement, grains, etc. Boats and smaller ships also sail according to the depth of river and lakes and quantity of water. Water transport has been divided into two categories (a) Inland water ways (b) Sea or ocean water ways

(A) Inland Waterways :

It goes through rivers and lakes located in the continental or land parts. For it, those rivers and

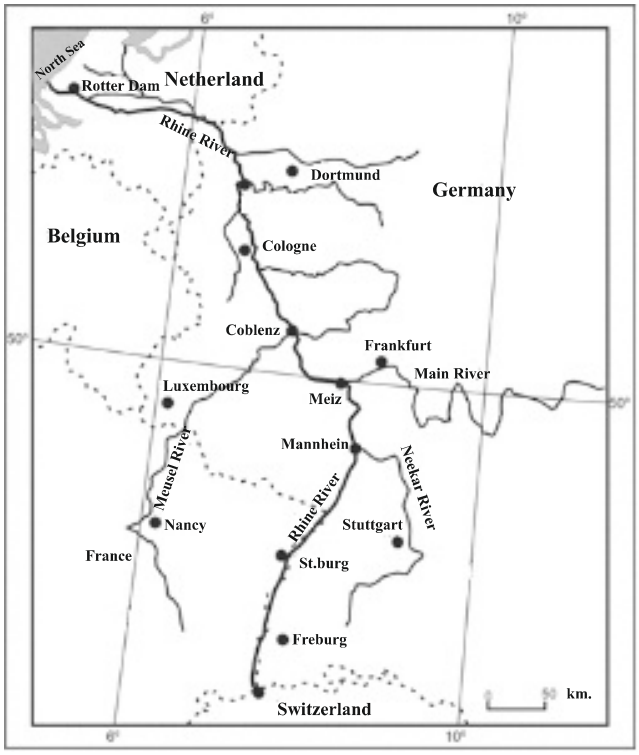
Fig. 10.5 : Modern port of Europe

Fig. 10.6 : Ship passing through Rhine Waterway

lakes are suitable which have sufficient water and depth, along with less slope. The deposits of sand in the river also cause obstruction in the water transport. Only seasonal transport is possible in the rivers and lakes which dry up in the dry season or freeze during the winter season. The parts of the world having sufficient water flow in big rivers, they are used for water transport. A description of the major inland water ways of the world is as follows-

(i) The Inland waterways of Europe :

Europe is in a much better condition from the view point of internal waterways. The river falling into the Atlantic Ocean in the north-west and the Mediterranean sea in the south provide facility of international trade to the European countries. The rivers flowing towards the north, Rhine, Seine and Po rivers, the river flowing towards the south,



Map 10.6 : Rhine Waterways

Denube, Don, Dnieper and Dniester river and the Volga river falling into the Caspian sea, the water of these rivers is used for water transport. Canals have been built for water transport. In some countries of western Europe (Germany, France etc.). The river Rhine flows through Germany and Netherland. Rhone river joins the river Rhine in the east, which flows from prosperous coal belt. This water way is most used water way of world.

(ii) The Internal water ways of North America :

There is full facility of water transport in the Great Lakes located between the U.S.A. and Canada. It is an important trade route due to the facility of movement of ships through Lake Superior, Michigan, Huron and Erie to the mouth of St. Lawrence river. The Mississippi, Missouri and Ohio rivers are also navigable, which connects many industrial cities. Besides the great lakes route in Canada, there is water transport in Saskatchewan, Mackenzie and Ottawa rivers but is interrupted in the winter season due to snow cover (frozen).

(iii) The Internal Water Ways of Asia :

The Hwang-Ho river in China is navigable to approximately 200 km form its mouth. Yang te-se-kiang river is also navigable from Shanghai city on it's mouth till Que-kiang. The Sikiang river flowing in the southern part is comparatively more navigable. The river Irrawadi, Menan, Sikiang etc. in south-east Asia are navigable only for a small distance from the mouth, have a very low importance is terms of trade.

(iv) The Internal Waterways of South America :

The big river Amazon flowing from the west to the east in south-America along with its tributaries provides 30,000 km long waterways. Southern Brazil, Argentina and Uraguay have the facility of waterways from Parana, Paraguay and Plata rivers, where ships easily reach upto 1500 km from the mouth.

(v) The Internal Waterways of Africa :

There are many big rivers like Nile, Congo, Niger, etc. in Africa. Although river Nile is navigable only in its mouth, but the Niger and Congo rivers have a facility of navigation till 1100 km inner part from the mouth.

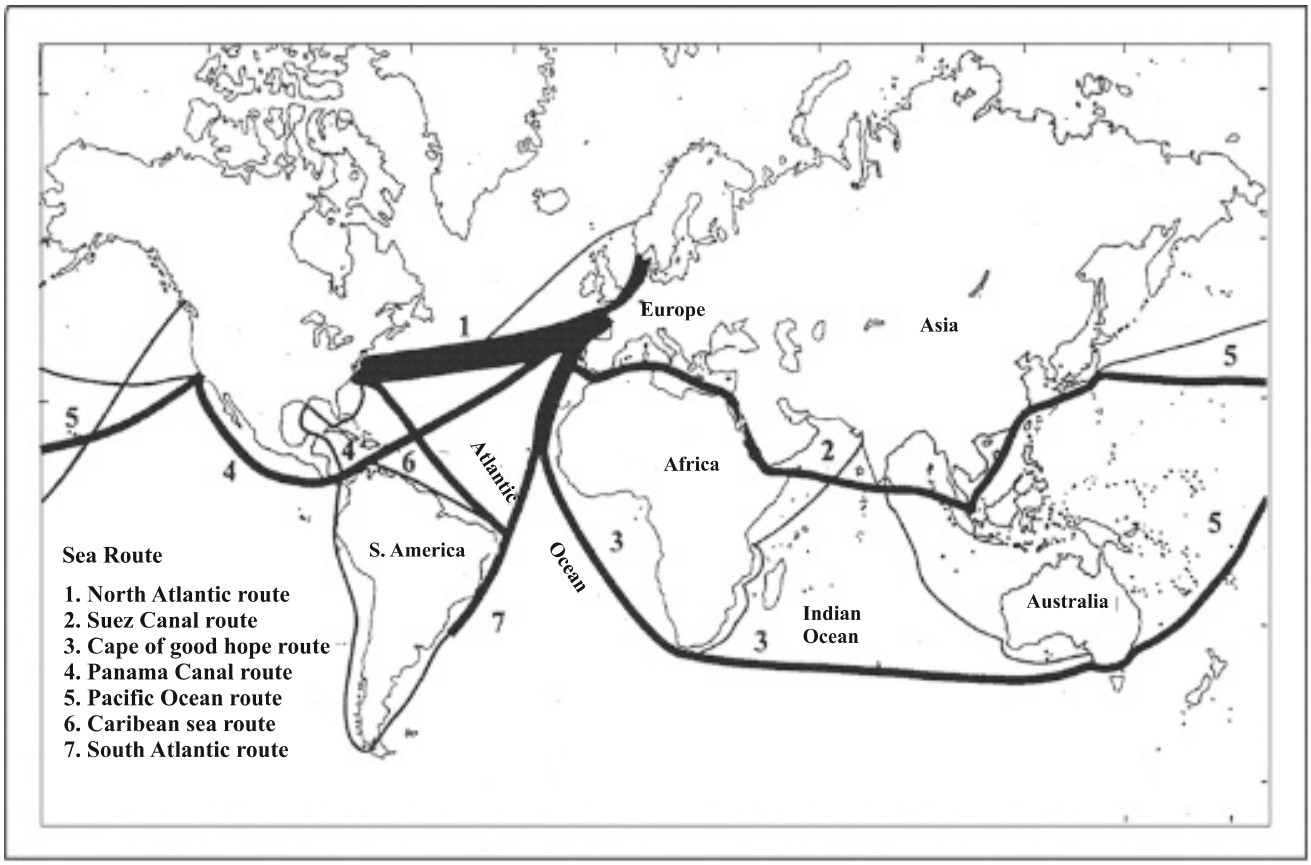
(vi) In Australia, ships can reach till 1500 kms deep from the mouths of rivers Murray and Darling. Other rivers are not navigable.

(B) Ocean Waterways :

The oceans present such routes which may be directed in all the directions and require no maintenance. The sea transport of heavy materials over long distance from one continent to another is comparatively cheap than land and air transport. A brief description of the major ocean waterways of the world is as follows-

(i) North Atlantic Route :

It is the busiest ocean waterways of the world. Highly used, this waterway connects the West European countries to North America (U.S.A. and



Map 10.7 : Major Sea routes of World

Canada). Approximately one-fourth part of the international trade in the world is transported by this waterway. 25 % ships of the world sail on this ocean routes. Out of the 50 large seaports of the world, 30 are on this route.

(ii) Mediterranean sea and Indian Ocean Waterways :

It is the longest trading route of the world. It goes through the middle part of the world. It serves the biggest land part and the maximum population of the world. This waterway serves approximately 70 % population of the world. This sea route passes through the area called 'Heart Land' of the ancient world. It connects the industrial countries of western Europe to eastern Africa, south Asia and Australia via Mediterranean sea, Red sea and the Indian ocean and joins the commercial farming of New Zealand and animal husbandry based economies. Before the construction of the Suez canal, this route connected Liverpool and Colombo, which was 6400 kms. longer than the Suez canal route. Due to prosperous natural resources like gold, diamond, copper, tin, groundnut, tea, cotton, coffee, rubber, sugar, fruits etc. the quality of trade and transport between the eastern and western Africa is increasing. Ports Said, Adan, Mumbai, Cochin, Colombo, Adelaide, etc. ports are located on this waterway.

(iii) Cape of Good Hope :

Across the Atlantic Ocean, it is an important sea route. It connects western Euro pean and western African countries to Brazil, Argentina and Uraguay in south America. Due to the limited development and scarce population of South America and Africa, the traffic on this route is less as compared to the North Atlantic route. The ships of western Europe pass through the Cape Verde Island making a big circle and reach the cape of Good Hope in the south of Africa. Here, there is the Cape Town harbour. The

ships going to Indonesia from here comes in the way of great circle. The route from Cape Town to Australia and New Zealand is a bit north of the great circle, so that storms and glaciers do not come in the way of the ships. On the route, there are ports of Cape Town, Port Elizabeth, Adelaide, Melbourne, Sydney, etc. to get fuel for the ships.

(iv) Southern Atlantic Waterways :

From Rio-de-Janerio, the ships go to eastern Africa, Asia and Australia via-Cape Town. In south America (a) There are dense forest like the Amazon Basin (b) The plateau of Brazil and vast pastures (c) Fertile agricultural regions like Pampas (d) Regions of mineral wealth like Andes. Wheat, maize, wood, leather, meat coffee, cotton, tobacco, sugar, machines, iron-steel, minerals, etc. are exported from ports of Rio-de-Janerio, Santiago, Buenos Aires, Wahia Blanca, etc. on the eastern coast of South America.

(v) Caribean Bay Sea Route :

The exchange of goods takes place between the coastal countries of the Caribean Sea i.e. Columbia, Venezuela, Trinidad, Guyana, Surinam, western Island groups, coastal countries of the Gulf of Mexico, Mexico and the U.S.A. through this route. It is a small distance sea route which combines the Gulf of Mexico and the harbours of the Caribean sea coast. On this route, mainly sugar, coconut, coffee, banana, vegetables, hard wood, petroleum iron-ore, bauxite, etc. are exported from the ports of North and South America by the Panama Canal.

(vi) Pacific Ocean Waterways :

Pacific Ocean is the largest ocean. It is spread on 12 % area of the earth`s surface but the trade transport is very less in it. There are two reasons for it (a) The main industrial regions of the world are on the European and American Atlantic coasts (b) There are no such islands in the pacific ocean having trade importance. Along with this, except Japan in the western part, there is no industry based developed country and in the eastern part also, all other are developing countries except the U.S.A. and Canada. The main waterway passes through the Honolulu port of the Hawaii Island in the middle of North Pacific ocean. The ships of north and South America reach directly to Honolulu passing the Panama. From here, this waterway divides into two waterways (1) The northern route which goes to Japan, China, Philippines and Indonesia (ii) The southern route, by which the ships sail towards Australia and New Zealand. The harbours of North America are Los Angeles San Francisco, Seattle, Portland, Vancouver and Prince Rupert.

(vii) Suez Canal Route :

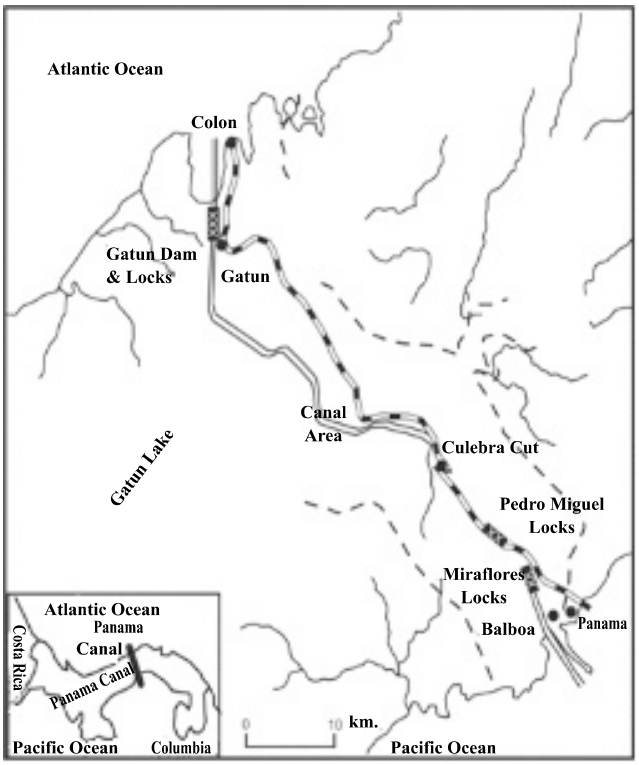
The Suez Canal in Egypt is an artificial waterway made to join the Mediterranean sea to the Red Sea. This plan started in 1859 under the directions of engineer Ferdinand-de-Lesseps of the French embassy located at Alexandria. The canal was inaugurated in 1869. The length of this canal is 162kms. The average width is 60 metre and depth is 10 metre. The Egyptian govt. nationalized it in 1956.

Map 10.8 : Suez Canal

The United Nations Organization gave approval to this nationalization in 1967. Approximately 100 ships sail in this canal daily. It provides a new entrance route to Europe in the Indian Ocean. A distance of about 1600 kms is saved by the direct seaways between Liverpool and Colombo, as compared to the Cape of Good Hope route. Along this canal, a rail route goes till Suez and then from Ismailia, a branch goes to Cairo. The navigable fresh water canal from the river Nile also meets the Suez Canal is Islamia. With its construction, the goods became cheap due to trade importance between eastern countries and Europe and western countries, and there was a growth in trade. By this canal, the longest sea route of the world which goes from Atlantic Ocean to the Mediterranean Sea and via Suez Canal, goes till the northern port of the Indian Ocean. It is also known by the name of west Europe-Mediterranean Sea-Indian Ocean route. The ships from North America and Europe to the Asian countries (Saudi Arabia, Iraq, Iran, Pakistan, India, Sri Lanka, Myanmar, Thailand, Singapore, Indonesia, China, Japan, etc.) pass through this route.

(vii) Panama Canal :

This canal connects the Atlantic Ocean in the east to the Pacific Ocean in the west . Panama Canal between North America and South America was inaugurated on 15th August, 1914. Although, the idea of this canal came in 16th century, but it took many years in implementation of this plan. Its reason was that the land of Panama was mountainous and to remove its obstacles. Many locks had to be made at many places in the canal. It was built across the Panama Canal and Colon by the United States of America, under which 8 km area from each side was purchased and given the name of Canal Commission. This canal remained under the U.S.A. for 85 years. Since 1st January 2000 the Panama City has established its control over it. Panama Canal is 82 km long and has 12 km long excessive deep cuts. Its minimum depth is 12 metre and width is 90



Map 10.9 : Panama Canal

metre. The biggest sea part of the canal is 26 metres above the sea level. In this canal, there are lock system entering through six water regulated system (a) Gatun locks on the Atlantic side (b) Pedromigue[1] lock in the middle (c) Micraflores lock on the Pacific side. Through these locks, the ships cross the mountainous land. By going through this canal, the distance of approximately 13000 kms has shortened between New York and San Francisco, compared to Cape Horn route. A distance of about 9000 kms From New Orleans to San Fransisco, 6500 kms from New York to Sydney and 6000 kms from New York to Valpariso (Chile) is saved. The economic importance of this canal is comparatively less than the Suez Canal. Still, it is has an important role in the economy of South America.

Air Transport

Air Transport has developed in the world after the First World War (1914-19). Since the second half of the twentieth century, air transport has increased a lot. The present generation is also called the 'Aero

generation.' These days, fast-moving aero planes are being used for traffic. From the viewpoint of transport, it is the fastest but most expensive means. This is the reason that only light, expensive and perishable goods are sent by aero planes. Air transport is not suitable for the transport of cheap and heavy goods. In mountain areas or other remote areas, where no water transport or land transport is possible, passengers and goods can be transported by smaller aero planes or helicopter. For rescue work is natural calamities, such as floods, earthquakes, war, etc. the air transport proves to be the most useful. The roads get blocked in mountains, snow areas and adverse desert areas, Himalayas due to land slide or heavy snowfall. In such cases, airplane is the only alternative.

Highly developed installation facilities such as- aero houses, airports, air base, landing, fuel and maintenance are essential for the construction and working system of aircrafts. The construction of airports is very expensive. There are daily air services in many parts of the world. Although the use of commercial air transport of Britain is a role model to be followed. The U.S.A has developed international citizen aviation post war. Today, regular services are being provided in many parts of the world by more than 250 commercial airlines. The supersonic aircraft covers the distance between London and New York within three hours.

Inter Continental Air Transport :

There is a clear east west shelf of intercontinental airways in the Northern Hemisphere. There is a dense network of airways in the eastern U.S.A., Western Europe and South East Asia. 60% part of the total airways of the world is used by the U.S.A alone. New York, London, Paris, Amsterdam and Chicago are the central points from where the airways spread and radiate towards all the continents.

There is a lack of air services in Africa, the Asian part of Russia and South America. In the southern hemisphere, between 10^0 - 35^0 latitudes, limited air services are available due to low population, limited land and less economic development (Map 10.10)

Kinds of Airways :

There are 6 kinds of airways in the world:-

(1) Inter continental global airways : They are the routes of longest journey (i) New York-London-Paris-Rome-Cairo-Delhi-Mumbai-Kolkata-Hong-Kong-Tokyo airways. It is the longest airways. (ii) New York San Francisco-Honolulu-Hong Kong-Adelaide-Perth route which crosses the Pacific Ocean.

(2) Continental Airways : The airways between different countries of a continent such as (i) New York- Chicago Montreal route (ii) London-Paris-Frankfurt-Prague-Warsaw route (iii)London-Frankfurt Warsaw- Moscow air way (iv) Delhi-Kolkata- Hong Kong-Tokyo route.

(3) National Airways : To make journey of long distance within a country such as (i) New York-Chicago-San Francisco route (ii) Leningrad-Moscow (iii) Delhi-Kanpur-Patna-Kolkata route

(4) Regional Airways : Even smaller journeys are done in a region by airways in order to save time. Such regional airways have developed in rich countries like the U.S.A., the U.S.S.R., Germany, Britain, Japan, Canada, Australia, etc., which is on a constant rise.

(5) Local Airways : The local air travel is usually done by means of helicopters.

(6) The various journeys of all the heads of the states, administrators of army officers, war, diplomatic and political importance is done by various kinds of aero planes, helicopters, etc.

According to the continents, the major air-ports in the world are as follows New York, New Orleans, Chicago, San Francisco, Los Angeles (U.S.A.), Montreal, Ottawa (Canada), Mexico city in North America, Rio-de-Jenerio, Buenos Aires, Santiago, etc. in South America, London Paris,

Map 10.10 : Major Sea & Air Routes of the World

Berlin, Rome, Moscow, etc. in Europe, Tokyo, Shanghai, Beijing, Bangkok, Singapore, Jakarta, Rangoon, Kolkata, Mumbai, Delhi, Chennai, Karachi, Colombo, etc. in Asia, Cape Town, Addis Ababa, Nairobi, Cairo, etc. in Africa and Sydney, Melbourne, Perth, Canberra, etc. in Australia.

Pipeline Transport

Pipelines are the most modern means of transport. Through them, the crude oil reaches to the refineries and purified petroleum products to the consumer centres. Besides this, the transport of natural gas is also done by the pipelines. Greater density of pipelines in the world is found in Europe and Middle east countries. The supply of pipelines for the uninterrupted flow and transport of liquid and gaseous material such as water, petroleum and natural gases is known to all. The supply of domestic gas and L.P.G. in many parts of the world is done by pipelines. In New Zealand, milk is sent from the farms to the factories by means of pipelines. A dense network of oil pipelines is found between the producing areas and the consumer centres in the U.S.A. In Europe, Western Asia and India, Pipelines are used to connect the oil wells with the refineries and ports and domestic markets. The pipelines have been extended to Iran and some ports of China from Turkmenistan located in Central Asia.

The proposed gas pipelines between Iran-India via Pakistan will be the longest international oil and natural gas pipeline in the world.

Major Pipelines of the World

(1) Big inch Pipeline : Oil is transported through this Pipeline, from the coastal wells of the gulf of Mexico in U.S.A. to the north east states.

(2) TAP Line (Trans-Arabian Peninsula) : This pipeline connects the wells near the Gulf of Persia to Sidan. Its length is more than 1600 kms.

(3) Comecon Pipeline : It is located in the erst while U.S.S.R. Oil is transported by it from the wells of Volga and Ural to the countries of Eastern Europe.

(4) O.I.L. Pipeline : The 1157 km long, Asia's first pipeline (from Naharkatiya oil field of Assam to oil refinery at Barauni) was built by the I.O.L. It has been extended till Kanpur in 1966.

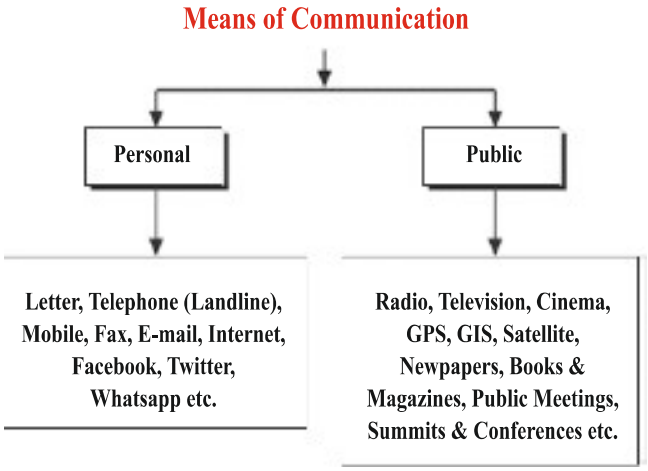
(5) H.V.J. Pipeline : Another expanded pipeline network in Western India Ankeleshwer-Koyli, Mumbai High-Koyli and Hajira- Vijaypura-Jagdishpur (HVJ) was built. Recently a 1256 km long pipeline has been built from Salaya (Gujrat) to Mathura (U.P)

(6) TAPI : The most awaited Turkmenistan, Afghanistan, Pakistan, India (TAPI) gas pipeline project was inaugurated on 3rd December 2015 at the historical silk route connected city 'Mary' (Turkmenistan). It will be completed by 2019 which will be 1814 kms long. It will be from Galkinaish (Turkmenistan) area to Fazilka (India) via Kandhar (Afghanistan-774 kms) and Multan (Pakistan-826 kms)

Communication :

Man has developed various means of communication in due course of time. In the early times, people sent messages by beating drum or traditional vocal instruments or signs of fire or smoke. At that time, horses, camels, dogs, bird and other animals were also used. Later on, men used methods for long distance network amongst which Telegraph and telephone were important. Telegraph became the source of imperialism in America in the west. The telephone industry of the U.S.A. had a copy right on telephone and telegraph Company. Even today, telephone is the most widely used thing after mobile. Post office, printing press, discovery of telephone, mobile and satellites has made the world very fast and easy. The development in the field of science and technology has given an important contribution in the development of communication.

Today, development is happening at an amazing pace. First important development is the use of optical fiber wires. Facing the increasing competition, the companies in order to include



optical wires in the entire world developed their copper wired system. In the decade of 1990, along with digitilisation of information, telephone gradually merged with the computer. As a result a co-ordinate network developed, which is known as of Internet.

Satellite Communication

Since 1970, when advanced research was done by the U.S.A. and erstwhile U.S.S.R. (Russia) in the field of space science, the communication via satellites has started a new era in the field of communication technology. Due to the successful launch of artificial satellites in the orbit of the earth, now the remote areas where verification was limited, of the globe have been connected. By the use of this technology, the unit value in context of distance and increase in time has been controlled, which means the cost incurred on communication to a distance of 500 kms. is equal to the cost incurred in communication to a distance of 5000 km by a satellite.

India has also taken major steps in the field of development of satellites. Aryabhatta was launched on 19th April, 1979, Bhaskar-1 in 1979 and Rohini in 1980. On 18th June 1981, the launch of Apple was done by the Aerian Rocket. Bhaskar, Challenger and Insat-1 B has made the communication of long distance (Television and Radio) more effective.

Cyber Space Internet

Cyber space is a computerized space network run by electricity. It is frequented by world wide website such as internet. The rate at which electronic network has expanded is unprecedented. The number of internet users was 5 crores in 1995, 40 crors in 2000, 100 crores in 2005 and approximately 383 crores in June 2016. The highest number of users in the world is 49.6% in Europe, 16.9% in the U.S.A. and 10.70% people are connected to the internet is Asia.

Presently, crores of people are using the internet every year. The cyber space will expand the contemporary economic and social works of the people by the means of e-mail, e-commerce, e-education and e-administration. Along with fax, television and radio, internet will reach to more and more people crossing the borders of time and space. These are modern communication systems which have realized the concept of global village much more than transport. With the development of technology, restrictions from the view point of security are being removed. Information and satellite picture are being used by the commercial companies, educational institutions and govt. for non-military areas such as city planning, pollution control, searching areas affected by deforestation and to indentify numerous physical patterns and processes.

IMPORTANT POINTS

1. For the rapid development of the world, the development of transport and communication amongst tertiary activities is essential. Under it, roads, rails, air, water transport and rope ways are included.
2. **Transport -** The land transport is divided into two major parts (i) Road transport (ii) Rail Transport. Pipeline transport amongst others.
3. **Road Transport -** Under road transport, narrow lanes to metalled roads fit for motor vehicles are included. The maximum length of roads in the world is in the U.S.A. 6586610

kms and the maximum number of express highways is in Brazil of South America, 123000 kms.

4. **Highways of the world -** Highways are the metalled roads connecting distant areas. They connect the ports, cities and each metropolitan in the countries of the world. 63 lac km long roads in America and the national highways density is also the maximum 0.65 km in U.S.A.

5. The major highways of the world are (i) Pan-America highways (ii) Trans Canadian Highway, (iii) Alaska Highway and (iv) Stuart Highway.

6. **Rail Transport -** The rail engine was first invented in England. The development of railways is popular in Britain, U.S.A., Japan, Russia, China, Germany and India. In Europe, the densest rail density of the world is found in Belgium where it is 1 km per 6.5 sq km.

7. **The Major railways of the world -** Canadian Pacific, Canadian National Railway, Trans Siberian, The Inter-Continental rail routes of the U.S.A. Australian inter-continental, Orient express, etc.

8. **Water Transport -** Water transport is a cheap means to carry heavy load over long distance. The internal waterways in the world pass through the rivers and lakes in the continental or land areas.

9. (i) In the inland waterways of Europe, canals have been constructed for the transport in Danube, Don, Rhine, Siene, Dnieper, Dniester. Volga Rivers. (ii) The inland waterways of North and South America are business routes till the mouths of the Superior, Michigan, Huron and Erie lakes, Mississippi-Missouri, Ohio rivers. (iii) The inland waterways of Asia-Hwang-ho and Yangtze kiang rivers in China, Ganges, Brahmaputra, Godavari, Krishna, Mahanadi, Irrawadi, Sikiang and Mekong rivers are navigable (iv) The internal water ways of Africa and Australia- There is navigation transport on the mouths of the river Nile, Congo, Zaire, Niger and Murray-Darlings.

10. **Ocean waterways -** The sea transport of heavy materials for long distance is cheaper from one continent to another.

11. The development of air transport in the world started after 1914-19. The present age is also called the Aero age. There are 6 types of air ways in the world.

12. **Pipeline Transport -** The crude oil is transported to the refineries by means of pipeline transport. The world pipeline transport density is found in Europe and the middle-east countries. Amongst other works, such as milk is sent from the farms to the factories in New Zealand. The gas pipelines are in Iran, Iraq, America, China and India.

13. **Communication -** Man has made a remarkable contribution in the field of science and technology by an amazing development in the world with the technological inventions to reduce the distances of the world.

14. The internet has reached to maximum number of people crossing the limits of time and place alongwith telegraph, telephone, satellite network, G.I.S., G.P.S., cyber space internet, www. to e-education, e-administration,e-commerce, fax, television and radio.

EXERCISE

Multiple Choice Type Questions :

1. The transfer of goods or people to a place by means of any physical medium is called -

   (A) Migration (B) Transport

   (C) Communication (D) All of the above

2. The maximum length of roads in the world is in which country?

(A) India (B) U.S.A

(C) Japan (D) China

3. The Highway connecting Saint John city to Vancouver City is-

(A) Pan-American (B) Trans-Canadian

(C) Alaska Highway (D) Stuart Highway

4. The longest national Highway of India is-

(A) NH 7 (B) NH 8

(C) NH 15 (D) NH 27

5. How many metropolitans have been included in the golden quadrilateral Project ?

(A) 5 (B) 2

(C) 4 (D) 7

6. The first train of the world started in-

(A) England (B) India

(C) America (D) China

7. The Euro Tunnel Channel connects-

(A) England with Paris

(B) London with Paris

(C) Auckland with Paris

(D) Europe and English Channel

8. The longest rail route in the world is-

(A) Canadian-Pacific Route

(B) Northern Inter-Continental Route

(C) Trans-Siberian

(D) Cape-Cairo

9. The busiest sea waterways of the world is

(A) Mediterranean sea and Indian Ocean

(B) Southern Atlantic

(C) Pacific Ocean

(D) North Atlantic

10. 'Trio-system' has been built on which canal ?

(A) Suez Canal (B) Panama Canal

(C) Soo Canal (D) Rhine Canal

11. How many kinds of airways are there in the world ?

(A) 5 (B) 10

(C) 6 (D) 15

12. Amongst the means of communication, which is not included in the public network ?

(A) Radio (B) Television

(C) Internet (D) GPS

Very Short Answer Type Questions

13. What is meant by transport?

14. Which country has the maximum length of roads in the world?

15. Which two cities are connected by the Trans Canadian Highway ?

16. Which materials can be transported by means of Pipelines?

17. What is meant by communication?

18. What is Internet?

Short Answer Type Questions

19. Write a note on the inland waterways of the world.

20. Names the major sea waterways of the world.

21. Write a note on the Road Highways of the world.

22. Describe the Trans-Siberian Rail route.

23. Describe the Panama Canal Route.

24. Mention the Characteristics of the Suez Canal Route.

25. Write a note on the Canadian Pacific rail route.

26. Describe the major means of communication.

Essay Type Questions

27. Describe any two major rail routes of the world?

28. Throw light on the trade importance of the Suez and Panama waterways?

29. Describe the importance of the North Atlantic waterways?

30. Mentioning the importance of the air transport of the world, describe any one kind of air transport?