Q] Explain 4G/5G Cellular Network.

Ans Cellular technology is the foundation of mobile wireless communication and supports users in locations that are not easily served by wired Network.

The cellular Technology consist of ~~four~~ five Generation.

First Generation

The original cellular Network now dubbed 1G, provided analog traffic channels and was designed to be extension of the public switch. The most widely deployed 1G system was the Advanced ~~Phone~~ Mobile Phone Service (AMPS).

Second Generation

A Second Generation (2G) was developed to provide higher quality Signals, at compare to First Generation (1G).

There are many differents between First and Second Generation as follows.

(1) Digital Traffic channel.
(2) Encryption
(3) Error detection and correction.
(4) Channel access.

Third Generation

The main purpose of Third Generation is to provide fomy high - speed wireless communication to support multimedia, data and video in addition to voice.

Fourth Generation

The Evolution of Smartphones and cellular networks has ushered in a new generation of capabilities and standard. which is collectively called 4G. It is faster then 3G network and be used in TV, like video calls connectivity.

Fifth Generation

5G systems are still some years away, but will be faster and better Then 4G network.

5G Network will be used to ~~bet~~ handle huge of amount of traffic Generated by Teslet, mobile, etc.

(3) Explain Type of Network and Internet Traffic.

Ans Type of Traffic:-

(1) Elastic Traffic.

(2) InElastic Traffic

(3) ~~Real Time Traffic Characteristics~~.

(1) Elastic Traffic

Elastic Traffic is that which can adjust, over wide ranges, to changes in delay and Throughout across an internet and still meet the needs of its application.
This is the traditional type of Traffic Supported on TCP/IP-based internet and is the type of trafic for which internet was designed.
Transmission control Protocol (TCP) or User Datagram Protocol (UDP) is an transport protol. In the case of UDP, the applications will use as much as capacity as is available up to the rate that the application generates data.

② InElastic Traffic :-

InElastic traffic does not even if you confine your attention to elastic traffic, some service prioritizing and controlling traffic could be of benefit without such as Server, Routers are dealing evenhandedly with arriving IP Packets, with no concern for the type of application and whether a particular packet is part of a large transfer element or a small one.

Under such circumstance, and if congestion develops, it is unlikely that resources will be allowed in such a way to meet the needs of all applications.

~~③ Real Time Traffic~~

d5] Explain Cloud Service in detail.

Ans = Software as a Service (SaaS)
Platform as a Service (PaaS)
Infrastructure as a Service (IaaS).

Software as a Service (SaaS).

→ In this type of service, the service is provided to the customer in the form of Software.
SaaS Enables the customer to use the cloud provider's application, running on the provider cloud infrastructure. The application are accessible from various client device through a simple interface such as web browser. Instead of obtaining desktop and server licence for software products it uses, an enterprise obtain the same function from the cloud service.

The using of SaaS removes the complexity of software installation, configuration problems, etc.
Example :- Gmail, Google drive, etc.

Platform as a Service:

A paas as a Service services to customer in the form of a platform on which the customer's application can run.

Paas enable the customer to deploy onto the cloud infrastructure customer-created or ~~acq~~ acquired applications.

A paas cloud provider useful Software building tools.

Paas is useful for an organization that wants to develop new or tailored application while paying for the needed, computing resource only as needed and only for as long as needed.

AppEngine, Azure, etc are the Example of Paas.

Infrastructure as a Service

The customer used, or have access to the resources of underlying colud infrastructure. IaaS provide virtual machines and other abstracted hardware and operating systems. Iaa IaaS offer the customer processing storage, network, and other fundamental computing resources so that the customer can deploy and run arbitrary software, which can include operating system and applications. IaaS enable customer to combine basic computing services, such as monitoring, crunching and data storage.

Vendors currently offering each service:-

1. Backup and Recovery.
2. Cloud broker
3. Compute
4. Content delivery network.
5. Service management
6. Storage

(16) Explain various component of IOT-Enabled Things.

Ans:
List of components :-

1. Senior.
2. Actuators
3. Microcontrollers
4. ~~Embedded System~~
5. ~~Interconnection~~
6. Transceivers
7. RFID. (Radio-Frequency Identification).

(1) Sensor:

Sensors play an important Role in the IOT Things.

Sensors sences / get the data from the atmosphere or enviroment and convert it into the digital signal.

They accurately takes a analog data and convert it into digital data.

Examples. Fingerprint Sensors, Smoke Senior, etc.

② Actuators:

Actuators are the next part of a sensor. on the ~~pace~~ base of the digital data taken by the sensor or cracked by the sensor is further proceed and. on the basis of that the Actuator perform the Action.

It basically ~~atta~~ atact as a 'callback function for sensor.

③ Microcontroller:

Microcontroller are the same computer which is capable to perform a particular task assigned to them.

Microcontroller consist of Ram, Rom, processing chip and many other small things which make them a Micro computer They are particularly design to perform a particular task only.

Examples Washing Machine, Refrigerator, etc

(4) ~~Transceiver~~ Transceiver.

Transceiver is nothing but the combination of Transistor and Receiver.

It act as a both.

It Transmit the data as well as Receive the data digital data and perform algorithm on it.

~~The upper part of the~~

The half part of the Transceiver transmit the the data, means take the analog data, ~~and~~ ~~can~~ means the input signal and ~~with~~ with the help of oscillator a carrier Frequency is generated which take the input signal to the power Amplifier to Antenna.

Then ~~that~~ Antenna transmit the signal and then the another half ~~that~~ ~~that~~ act as a Receiver means the transmitted data from Antenna is Received by Amplifier and Filter further to remove the carrier Frequency and again output the original input signal.

(8) RFID:

RFID stands for Radio frequency Identification.

The main elements of an RFID system are tags and readers.

RFID tags are small programmable devices used for object, animal and human tracking. They come in a variety of shapes, size, and functionality and cost.

RFID readers acquire and sometimes rewrite information stored on RFID tag that come within operating range.

Readers are usually connected to a computer system that record and formats the acquired information for further uses.