

General Science & Ability

(e) Briefly explain the working and structure of a cell phone. [5]

1) What are cell phones:

Cell phones are portable electronic devices that, within a telephone service area, can make or receive calls over a radio frequency carrier.

2) Working of a cell phone:

A cell phone device works in three steps, these are enumerated and briefly discussed as follows

2.1 Electromagnetic Radio waves:

Cell phones employ electromagnetic radio waves to ~~em~~ transfer data. The digitized audio data is transported through electromagnetic field via radio waves. This data travels with the speed of light.

2.2 Antenna:

The task of the antenna is converting



electric signals into radio waves (transmitter) and the other way around (receiver). The number of antennas contained by a phone depends on the model of the phone.

2.3 Connectivity:

A cell phone is a two way wireless device that entails both inbound and outbound signals to function. The magnitude of signal received from cell tower is known as 'signal strength'. This, signal strength can be affected by many factors such as distance of cell tower, obstructions etc.

3) Structure of cell phones:

Cell phones are a rather intricate device and contains numerous features. To enumerate and discuss a few major parts is as follows:

3.1) FDMA and CDMA systems:

Frequency Division Multiple Access (FDMA) and Code Division Multiple Access (CDMA) were developed to distinguish between different frequencies of near-by cell phones, The objective was to select the particular phone to establish a connection so that people can communicate without any obstruction.

3.2) ADC & DAC:

ADC & DAC are used to convert analogue signals to digital and vice versa.

3.3) Touch screen display:

The lcd display can detect infra-red signal upon a touch and make execute appropriate actions etc select, hold, swipe etc.

3.4) Speaker:

The primary objective of a speaker is to convert electrical / digital signals into auditory signal that humans can hear and interpret.

ce) Explain Artificial Intelligence, what do you understand by the term Robotics? [5]

i) what is Artificial Intelligence:

Artificial Intelligence refers to the simulation of human intelligence in machines that enables, machines, to think like humans emulate & like them. The term can be applied to any machine

that exhibits human like behaviour such as learning and problem solving. AI enables the machines to learn from experiences and improve its response with the passage of time.

2) Examples of AI:

- > chess game
- > self driving car
- > Smart assistants e.g. Alexa, Siri

3) Robotics:

Robotics is a branch of engineering that deals with the conception, design, manufacture and operation of robots. Robots are widely used in such industries where work must be performed in environments hazardous to humans.

4) Examples of Robotics:

- > Autonomous Mobile Robots
- > Humanoids
- > Hybrids