

5NR AND 3GPP

- Only users of 5G capable smartphones will be able to experience these services.
- Currently, of the total smartphone base of about 600 million, only about 50-60 million handsets are estimated to be 5G smartphones, even though the first 5G smartphone was unveiled in the country two years ago in 2020.
- However, even users of these 50-60 million phones have been having trouble latching on to 5G services in the area where it is available.
- For the phones to start latching on to 5G networks in India, the first thing needed is support for 5G bands such as n1, n12, n78, n28, and n58 (these are some of the bands that are expected to work in India).
- A user can check this by viewing the phone's specifications on the manufacturer's website.
- A single phone can support multiple 5G bands.
- For phones that support the 5G bands in India, manufacturers need to undertake conformance and performance tests to make sure that network speed and quality are maintained.
- These tests take time, and hence the delay of a couple of months.

5G New Radio

- Frequency bands for 5G New Radio (5G NR), which is the air interface or radio access technology of the 5G mobile networks, are separated into two different frequency ranges.
- First, there is Frequency Range 1 (FR1), which includes sub-6 GHz frequency bands, some of which are traditionally used by previous standards, but have been extended to cover potential new spectrum offerings from 410 MHz to 7125 MHz.
- The other is Frequency Range 2 (FR2), which includes frequency bands from 24.25 GHz to 71.0 GHz.
- 5G NR (New Radio) is a new radio access technology (RAT) developed by 3GPP for the 5G (fifth generation) mobile network.
- It was designed to be the global standard for the air interface of 5G networks.

3GPP

- The 3rd Generation Partnership Project (3GPP) is an umbrella term for a number of standard organizations that develop protocols for mobile telecommunications. Its best-known work is the development and maintenance of:
- GSM and related 2G and 2.5G standards, including GPRS and EDGE

- UMTS and related 3G standards, including HSPA and HSPA+
- LTE and related 4G standards, including LTE Advanced and LTE Advanced Pro
- 5G NR and related 5G standards, including 5G-Advanced
- An evolved IP Multimedia Subsystem (IMS) developed in an access independent manner.
- 3GPP is a consortium with seven national or regional telecommunication standards organizations as primary members ("organizational partners") and a variety of other organizations as associate members ("market representation partners").
- The 3GPP organizes its work into three different streams: Radio Access Networks, Services and Systems Aspects, and Core Network and Terminals.
- The project was established in December 1998 with the goal of developing a specification for a 3G mobile phone system based on the 2G GSM system, within the scope of the International Telecommunication Union's International Mobile Telecommunications-2000, hence the name 3GPP.

THE HINDU

CRAR

Why is capital adequacy important for a bank?

- Capital adequacy ratio is an indicator of the ability of a bank to survive as a going business entity in case it suffers significant losses on its loan book.
- A bank cannot continue to operate if the total value of its assets drops below the total value of its liabilities as it would wipe out its capital (or net worth) and render the bank insolvent.
- So, banking regulations such as the Basel-III norms try to closely monitor changes in the capital adequacy of banks in order to prevent major bank failures which could have a severe impact on the wider economy.
- The capital position of a bank should not be confused with cash held by a bank in its vaults to make good on its commitment to depositors.
- The CRAR, which is a ratio that compares the value of a bank's capital (or net worth) against the value of its various assets weighted according to how risky each asset is, is used to gauge the risk of insolvency faced by a bank.
- The riskier a type of asset held in a bank's balance sheet, the higher the weightage given to the value of the

asset while calculating the bank's capital adequacy ratio.

- This causes the capital adequacy ratio of the bank to drop, thus signaling a higher risk of insolvency during crises.
- In other words, the CRAR tries to gauge the risk posed to the solvency of the bank by the quality or riskiness of the assets on the bank's balance sheet.

THE HINDU

PARTICLE POLLUTION

- Particle pollution also called particulate matter (PM) is made up of particles (tiny pieces) of solids or liquids that are in the air. These particles may include:
 - Dust
 - Dirt
 - Soot
 - Smoke
 - Drops of liquid
- Some particles are big enough (or appear dark enough) to see, for example, you can often see smoke in the air. Others are so small that you can't see them in the air.

Where does particle pollution come from?

- Particle pollution can come from two different kinds of sources primary or

secondary. Primary sources cause particle pollution on their own. For example, wood stoves and forest fires are primary sources.

- Secondary sources let off gases that can form particles. Power plants and coal fires are examples of secondary sources. Some other common sources of particle pollution can be either primary or secondary for example, factories, cars and trucks, and construction sites.
- Smoke from fires and emissions (releases) from power plants, industrial facilities, and cars and trucks contain PM2.5.
- Particle Pollution and Your Health
- Breathing in particle pollution can be harmful to your health. Coarse (bigger) particles, called PM10, can irritate your eyes, nose, and throat. Dust from roads, farms, dry riverbeds, construction sites, and mines are types of PM10.
- Fine (smaller) particles, called PM2.5, are more dangerous because they can get into the deep parts of your lungs or even into your blood.

THE HINDU

RECOMBINANT VIRUS AND xbb lineage

Recombinant viruses

- A recombinant virus may occur naturally or be produced by recombining pieces of DNA using recombinant DNA technology.
- This may be used to produce viral vaccines or gene therapy vectors.
- The term is also used to refer to naturally occurring recombination between virus genomes in a cell infected by more than one virus strain.
- This occurs either by Homologous recombination of the nucleic acid strands or by reassortment of genomic segments.
- Both these and mutation within the virus have been suggested as ways in which influenza and other viruses evolve.

What is XBB lineage

- While Europe and North America are currently seeing an emergence of Omicron variants, especially BQ.1 and its sublineages, a recombinant lineage XBB has been emerging in Asia.
- This lineage comes out of recombination of two Omicron sublineages BJ.1 and BA.2.75.

BOAT

- Astronomers have spotted what they think might be the most powerful explosion ever observed.
- The explosion is a gamma-ray burst which is known as GRB221009A, which might have been caused by a supernova that left behind a black hole.
- “Informally, we’ve been calling it the BOAT the brightest of all time,”
- The problem, for scientists, is that the explosion is so bright that it is overwhelming the detectors of gamma-ray telescopes.

THE HINDU

GRAZING ANIMALS AND CLIMATE CHANGE

- “Grazing ecosystems store carbon in the soil and therefore decarbonize the atmosphere. Large mammals are crucial for all this.
- Unfortunately, wild mammals are confined to a few parks and reserves. Elsewhere wildlife has long been replaced by domestic livestock,
- Grazing animals can have a significant impact on the stability of soil carbon in grazing ecosystems, finds a study.
- Researchers from Indian Institute of Science, Bengaluru (IISc), observed

that experimentally removing grazing animals from the ecosystem resulted in higher fluctuations in soil carbon from one year to the next.

THE HINDU

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