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1. Consider the following pairs of festivals and the states in which they are celebrated

List I

- 1) Bhogali Bihu
- 2) Makaravilakku festival
- 3) Lokrang
- 4) Nongkrem

List II

- Assam
- Kerala
- Madhya Pradesh
- Meghalaya

Which of the pairs given above is/are correctly matched?

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1,3 and 4 only
- d) 1,2,3 and 4

2. Consider the following statements about millimeter wave band

- 1) Millimetre Wave band or mmWave is a particular segment of radio frequency spectrum that ranges between 24 GHz and 100 GHz.
- 2) This spectrum has a long wavelength, and is apt to deliver greater speeds and lower latencies.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

3. Consider the following statements about Chips to Startup (C2S) Programme

- 1) The Chips to Startup (C2S) Programme aims to train 85,000 numbers of high-quality and qualified engineers in the area of Very large-scale integration (VLSI) and Embedded System Design over a period of 5 years.
- 2) C-DAC (Centre for Development of Advanced Computing) under the Ministry of Electronics and Information Technology will serve as the nodal agency for the programme.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only

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- c) Both 1 and 2
- d) Neither 1 nor 2

4. Consider the following statements about the 5G technology.

1. 5G uses the Massive MIMO technology that uses multiple targeted beams to spotlight and follow users around a cell site, improving coverage, speed and capacity.
2. The 5G network signals do not travel very far and struggle to move through hard surfaces.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

5. Which of the following pairs is incorrectly matched?

- a) Meteoroids- A small piece of rocks moving in the solar system that would become a meteor if it entered the earth's atmosphere.
- b) Satellite- A celestial body that moves around the planets in the same way as the planets move around the sun.
- c) Asteroid-Tiny bodies which move around the sun between the orbits of Mars and Jupiter.
- d) None of the above

1)Answer: D

Explanation:

- **Bhogali Bihu**- Bhogali Bihu (mid-January, also called Magh Bihu) comes from the word **Bhog that is eating and enjoyment**.It is a harvest festival of Assam and **marks the end of harvesting season**. Since the granaries are full, there is a lot of feasting and eating during this period. On the eve of the day called uruka, i.e., the last day of pausa, menfolk, more particularly young men go to the field, preferably near a river, build a makeshift cottage called Bhelaghar with the hay of the harvest fields and the bonfire or Meji, the most important thing for the night.
- **Lokrang festival** - The Lokrang festival of Madhya Pradesh which commences on the republic day 26th January every year is a five-day long festival of Lokrang, Bhopal. The major features of this festival are **classical dances, tribal and folk dances, presentation and**

exhibition of art and craft, performing art form, and cultural presentations from foreign countries. Since India is a land of diversities, with each state having its own background and cultural heritages, the Lokrang festival attempts to speculate each of these.

- **Nongkrem Dance Festival-** Nongkrem Dance Festival is celebrated by the **indigenous Khasi tribe** of Meghalaya. Prayers are offered for a good harvest, peace and prosperity. 'Goat sacrifice' also forms an important part of the customs. Five days long religious festival devoted to appeasing the Goddess Ka Blei Synshar for a rich bumper harvest and prosperity of the people.
- **Makaravilakku** is an annual festival held on Makar Sankranti in Kerala, India at the shrine of Sabarimala. The festival includes the Thiruvabharanam procession and a congregation at the hill shrine of Sabarimala.

2) Answer: A

Explanation

What is a millimeter Wave band?

- **Statement 1 is correct and statement 2 is incorrect:** Millimetre Wave band or mmWave is a particular segment of radio frequency spectrum that ranges **between 24 GHz and 100 GHz**. This spectrum, as the name suggests, has a **short wavelength**, and is apt to **deliver greater speeds and lower latencies**.
- This in turn makes data transfer efficient and seamless as the current available networks work optimally only on lower frequency bandwidths.
- 5G services can be deployed using lower frequency bands. They can cover greater distances and are proven to work efficiently even in urban environments, which are prone to interference. But, when it comes to data speeds, these bands fail to hit peak potential needed for a true 5G experience. So, mmWave is an important piece in the 5G jigsaw puzzle for mobile service providers.

Why in News?

- The Satcom Industry Association-India (SIA), An industry body that represents interests of the communication satellite ecosystem in India has voiced concerns over the Government's plan to include the mmWave bands in the 5G spectrum auction.

3. Answer: C

Explanation

- In line with Prime Minister Narendra Modi's plan to transform India into the next semiconductor hub, the Ministry of Electronics and Information (MeitY) has sought applications from 100 academia, R&D organisations, start-ups and MSMEs under its Chips to Startup (C2S) Programme.

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- **Statement 1 is correct:** The **Chips to Startup (C2S) Programme** aims to train 85,000 number of high-quality and qualified engineers in the area of Very large-scale integration (VLSI) and Embedded System Design as well as result in development of 175 ASICs (Application Specific Integrated Circuits), Working Prototypes of 20 System on Chips (SoC) and IP Core repository over a period of 5 years.
- This will be a step towards leapfrogging in the Electronics System Design & Manufacturing (ESDM) space by way of inculcating the culture of SoC/ System Level Design at Bachelors, Masters and Research level and act as a catalyst for growth of Start-ups involved in fabless design.
- **Statement 2 is correct: C-DAC (Centre for Development of Advanced Computing)**, a scientific society operating under MeitY, will serve as the nodal agency for the programme.
- The programme would be implemented at about 100 academic institutions/R&D organisations across the Country (including IITs, NITs, IIITs, Government/Private Colleges and R&D Organisations). Startups and MSMEs can also participate in the programme by submitting their proposals under Academia- Industry Collaborative Project, Grand Challenge/ /Hackathons/RFP for development of System/SoC/IP Core(s).
- The C2S Programme addresses each entity of the value chain in electronics viz. quality manpower training, research and development, hardware IPs design, System design, application-oriented R&D, Prototype design and deployment with the help of academia, industry, start-ups and R&D establishments.
- Under the Programme, based on the Institutions' expertise, Technology Readiness Level (TRL) and design experience acquired during earlier SMDP Programmes, proposals are invited in three different categories, i.e., Design and Development of Systems/SoCs/ASICs/Reusable IP Core(s), Development of Application Oriented Working Prototype of IPs/ASICs/SoCs, and Proof of Concept oriented Research and Development of ASICs/FPGAs.

4) Answer: C

Explanation:

- 5G or fifth generation is the latest upgrade in the long-term evolution (LTE) mobile broadband networks.
- **Statement 1 is correct:** 5G uses a new digital technology called **Massive MIMO**, which stands for **multiple input multiple output**, that uses multiple targeted beams to spotlight and follow users around a cell site, improving coverage, speed and capacity.
- The three major benefits offered by 5G are **higher speeds, higher bandwidth and lower latency**.

Speed

- Speed is one of the most highly anticipated elements of the 5G network which is **expected to be nearly 100 times faster than 4G**.
- Such high speeds are possible because most 5G networks are to be built on **super-high-frequency airwaves**, also known as **high-band spectrum**.

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- The **higher frequencies can transmit much more data**, much faster than on 4G.

Capacity

- The 5G network is expected to have significantly more capacity than 4G.
- This is because 5G will have **greater bandwidth**, meaning it **can handle many more connected devices** than previous networks.
- It will bring in an "**internet of things**" era, filled with connected toothbrushes, kitchen appliances, street lamps and more.

Latency

- Latency is the time it takes for devices to communicate with each other or with the server that's sending them information.
- Latency is already low with 4G, but 5G will make it **virtually zero**.
- It will be essential for technologies such as **self-driving cars** which require instant communication of huge data to ensure safety of its passengers.

How is latency different from speed?

- A small but significant difference exists between speed and latency.
- Speed is the amount of time it takes to download the contents of a webpage.
- Latency is the time between when a text is sent to another phone and when that receiver's phone registers that it has received a new message.

Are there any drawbacks?

- **Statement 2 is correct:** The **high-band network signals don't travel very far** and struggle to move through hard surfaces.
- In order to compensate for those challenges, wireless carriers building high-band 5G networks are installing tons of small cell sites (about the size of pizza boxes) to light poles, walls or towers, often in relatively small proximity to one another. For that reason, most carriers are deploying 5G city by city.
- **Significant adoption of 5G is going to take years** — industry trade group GSMA estimates that by 2025, around half of mobile connections will be 5G (the rest will be older tech, like 4G and 3G).
- There are also concerns among regulators and others about the **security of 5G**, especially since crucial technologies such as self-driving cars and healthcare systems will be built on top of the network.



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		3G	4G	5G
	Deployment	2004-05	2006-10	2020
	Bandwidth	2mbps	200mbps	>1gbps
	Latency	100-500 milliseconds	20-30 milliseconds	<10 milliseconds
	Average Speed	144 kbps	25 mbps	200-400 mbps

5) Answer: D

Explanation

- A **Satellite** is a celestial body that **moves around the planets** in the same way as the planets move around the sun
- Apart from the stars, planets and satellites, there **are numerous tiny bodies** which also move around the sun. **These bodies are called asteroids.** They are found between the **orbits of Mars and Jupiter**
- **The small pieces of rocks** which move around the sun are called **meteoroids.** Sometimes these meteoroids come near the earth and tend to drop upon it. During this process **due to friction** with the air **they get heated up and burn** causing a **flash of light known as Meteor.** But if a meteoroid enters the Earth's atmosphere and hits the ground, it is called a meteorite.