

**Born:** January 9, 1922, Raipur, India [now Raipur, Pakistan].

**Research and Contribution:**

He began research on nucleic acids during a fellowship at the University of Cambridge (1951) under Sir Alexander Todd.

He made another contribution to genetics in 1970 when he and his research team were able to synthesize the first artificial copy of a yeast gene.

His later research explored the molecular mechanisms underlying the cell signaling pathways of vision in vertebrates.

His studies were concerned primarily with the structure and function of rhodopsin, a light-sensitive protein found in the retina of the vertebrate eye.

He also investigated mutations in rhodopsin that are associated with retinitis pigmentosa, which causes night blindness.

**Awards:**

He shared the 1968 Nobel Prize for Physiology or Medicine with Marshall W. Nirenberg and Robert W. Holley for research that helped to show how the nucleotides in nucleic acids, which carry the genetic code of the cell, control the cell's synthesis of proteins.

In addition to the Nobel Prize, Khorana received the Albert Lasker Basic Medical Research Award (1968) and the National Medal of Science (1987). The Indian government awarded Khorana the Padma Vibhushan in 1969.

91. (a)

**Option a is correct:** The LOFAR or the Low-Frequency Array is a large network of radio telescopes located primarily in the Netherlands, completed in the year 2012. **LOFAR has been developed by the Netherlands Institute for Radio Astronomy, the ASTRON Radio Observatory of the Organization for Scientific Research, and their international partners.** LOFAR consists of various kinds

of Omni-directional antennas with a new concept where the signals which are received from each antenna are not combined in real-time. The electronic signal from the antenna is transported and digitized to a central digital processor and then it is combined through software to emulate the conventional antenna and **making it the world's most powerful antenna.**

The project is based on an interferometric arrangement of radio telescopes with around 20,000 small antennas, which are currently concentrated in 52 stations. 38 of these stations are distributed in the Netherlands and were funded by ASTRON. There are other stations in Poland, Germany, Great Britain, France, Sweden, Latvia, and Ireland.

Italy officially joined the LOFAR International Telescope (ILT) in the year 2018, with a station near Bologna. More stations could also be built in other European countries.

92. (c)

**Both statements are correct:** The relentless efforts of a Parsi reformer, B.M. Malabari was rewarded by the enactment of the **Age of Consent Act (1891)** which **forbade the marriage of girls below the age of 12.**

**The Sarda Act (1929)** further pushed up the marriage **age to 18 and 14 for boys and girls, respectively.**

In free India, the Child Marriage Restraint (Amendment) Act, 1978 raised the age of marriage for girls from 15 to 18 years and boys from 18 to 21.

93. (b)

**Statement 1 is not correct:** In the later 1870s and early 1880s, a solid ground had been prepared for the establishment of an All-India organization. The final shape to this idea was given by a retired English civil servant, A.O. Hume, who mobilized leading intellectuals of the time and, with their cooperation, organized the first session of the Indian National Congress in Bombay in December 1885.