GOVERNMENT OF INDIA SCIENCE AND TECHNOLOGY LOK SABHA

UNSTARRED QUESTION NO:249 ANSWERED ON:22.07.2015 AMS Facility in Mumbai University Mahajan Smt. Poonam

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

- (a) the concept and uses of Accelerator Mass Spectrometry (AMS);
- (b) whether AMS facility with special emphasis on carbon dating has been established in Mumbai University;
- (c) if so, the details thereof;
- (d) the total amount of funds sanctioned/spent for the same; and
- (e) the details of applications with regard to AMS performed in various domains?

Answer

MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTER OF STATE IN THE MINISTRY OF EARTH SCIENCES (SHRI.Y. S. CHOWDARY)

(a) Accelerator Mass Spectrometry (AMS) is an ultra-sensitive technique for selective isotopic analysis and is utilized to determine the concentration of long lived radioisotopes that occur naturally in our environment. AMS is a rather new technique which started in 1977 with the first measurement of 14C in natural samples using Tandem accelerators. Soon after, various other long-lived radioisotopes were also studied using AMS technique e.g., 10Be, 26Al, 36Cl, 41Ca and129l. Since these initial studies, many other long-lived radioisotopes have also been studied including 32Si, 44Ti, 53Mn , 60Fe, 63Ni etc. The AMS technique has many uses in the field of Earth Sciences, Archaeology, Environmental Science and Biosciences.

(b) & (c): An AMS facility with special emphasis on carbon dating is being established at Mumbai University. This AMS facility is funded by the Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy (DAE), Mumbai through a research project. Mumbai University is collaborating with Tata Institute of Fundamental Research, Mumbai and Bhabha Atomic Research Centre, Mumbai for establishing this facility. At present, procurement of the AMS equipment is under progress.

(d) Out of the total project cost of Rs. 10.19 crores, the amount sanctioned for the AMS equipment is Rs. 9.61 crores.

(e) AMS has wide-ranging applications in a variety of fields, e.g., in archaeology for dating of artifacts, in earth sciences for studying possible global climate change by dating of terrestrial sediments, in oceanography for radiocarbon dating of ocean water which helps validate ocean circulation models, in glaciology for studies on CO¬2 concentrations in palaeo-atmospheres through measurements on trapped air bubbles in ice, in atmospheric sciences for studying origin of pollution in cities, in biomedical research and in drug testing.