Subject: Ph.D. Viva-Voce of Ms. Asha Kumari (2017PHZ8382) on July 21, 2023 (Friday) at 3:30 PM

Ph.D. Viva-Voce Notice (Department of Physics, IIT Delhi)

The Ph.D. Viva-Voce examination of Ms. Asha Kumari will be held as per the following schedule:

Name of the Student: **Ms. Asha Kumari (2017PHZ8382)**

Title of the Thesis: **Design and Development of Polymer Altered Liquid Crystal for Electro-Optic and Thermoelectric Applications**

Date: **21 July 2023, Friday**

Time: **03:30 PM**

Venue: **Seminar room**

Abstract:
Liquid crystals (LCs) have diverse applications in industries such as displays, telecommunications, biology, and optics. To meet industry demands, novel liquid crystalline materials with improved properties are needed. Liquid crystal-polymer composites (LCPCs) offer enhanced properties along with mechanical strength and flexibility. Various LCPC systems include polymer dispersed liquid crystals (PDLCs), polymer-filled liquid crystals (PFLCs), polymer self-assembly filled liquid crystals (PSALCs), and polymer-stabilized liquid crystals (PSLCs). The physical properties of LCPCs have been investigated to understand the effect of polymerization conditions, polymer morphology, and electro-optic behaviour. Applications of LCPCs include privacy windows, optical devices, energy harvesting, and sensors. In this presentation, we present that the use of barium titanate nanoparticles in epoxy based PDLC devices improves performance parameters. Bottlebrush polymers show potential in biomedical engineering and electro-optic applications, forming different structures based on polymer, LC, and solvent concentrations. The impact of polymer chain length on PFLC performance is examined, affecting transmittance, contrast ratio, and switching speed. The degree of polymerization in PSLCs influences their electrical, dielectric, and optical characteristics. Pseudopeptidic bottlebrush polymer moieties affect LC droplet arrangements and surface properties of PDLC samples. LC doping in carbon nanotube/polymer composites enhances the Seebeck coefficients and electrical conductivity, enabling flexible thermoelectric devices for wearable electronics. LCPCs offer possibilities for flexible devices, sensors, drug delivery, and holographic displays, among others, while providing efficient electro-optic and thermoelectric devices.

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