Mid Semester Examination
Course Name: Analytical Biotechnology (BT 601)
Time: 9.00-11.00, Dated: 04/03/2023
Total Marks: 30

Q1.

A. Derive step-wise the expression of K_d for SPR and mention all the terms.

B. Evaluate the immunoassay specificity in SPR mode for **I)** specific mAbhGH-25 binds only to 22K hGH isoform and **II)** specific mAb hGH-33 only recognizes 20K isoform.

C. Draw the UV-vis reflectance spectra of different AgFON substrates for 390 nm, 510 nm, and 600 nm for SERS measurements of Anthrax using 750 nm laser excitation

D. Write stepwise equation for *Adsorption Isotherm* and LOD for Bacillus Spores on AgFON Substrates.

E. *I)* How one can develop circularly polarized light?
II) Show CD diagram for kinetics of unfolding of a hypothetical protein in various concentration of denaturing agent.

(Marks: 3x 5=15)

Q2.

A. Derive step-wise the final equation for the apparent partition coefficient (APC) in partitioning of a dibasic acid between an oil and an aqueous phase [mention the constants C1 and C2 properly]

B. Plot relationship between APC and the concentrations of carbenoxolone at pH 3.0; pH 4.2 and pH 7.0, respectively (in a single plot).

C. Show the distribution of a compound having 1000 molecules applied to chromatography with Kp=1 through 6 identical theoretical plates with plot. [Consider whole number during calculation of distribution].

D. Show the distribution plot of another compound (500 molecules) in same 6 plates with Kp=0.1.

E. Calculate the number of theoretical pallets (N) and the plate height (h), when the retention time is 20.40 min and the base width is 1.30 min and the column length is 30 cm.

(Marks: 3x 5=15)
