

THE UNIVERSITY OF BURDWAN

Katwa College

B.Sc Semester-VI (Hons.) Practical Examination in Chemistry, 2020

Paper: CC-14

Full Marks: 20

Time: 2hrs

Examinees are hereby instructed to write their answer with the front page prescribed by the University of Burdwan and must send their complete answer script in a single pdf file to the following mail id within 12:30 PM. [kc.deptchemistry@gmail.com](mailto:kc.deptchemistry@gmail.com)

1. (a) Write down the basic principle of determination of surface tension of a liquid by drop-volume method using Stalagmometer. (b) A spherical drop of a liquid weighing 40.192 mg is dispersed into 1500 microglobules of radius 0.02 cm each by a suitable experimental device. Find the increase surface energy. [5+10]

University Roll No.	$\rho$ value (g cm <sup>3</sup> )	$\gamma$ value (dyne cm <sup>-1</sup> )
170311200029	0.84	32
170311200044	0.73	24
170311200100	0.93	41
170311200150	0.68	19

OR

- (a) State and explain the verification of Lambert's and Beer's Law of a dilute solution by using spectrophotometrically. (b) A mixture of dichromate and permanganate ions was analyzed spectrophotometrically at 440 and 545 nm as a means for the simultaneous determination of two species and the observed absorbance value were "X" and "Y" respectively, at each wavelength for a 1.00 cm cell. Calculate the concentration of dichromate and permanganate in the unknown mixture. [Given :Pure solution of K<sub>2</sub>CrO<sub>7</sub> (1.09×10<sup>-3</sup> M) A<sub>440</sub> =0.403 and A<sub>545</sub> = 0.011 and for pure solution of KMnO<sub>4</sub> (0.28×10<sup>-3</sup> M) A<sub>440</sub> = 0.026 and A<sub>545</sub> =0.658] [5+10]

University Roll No.	X value ( $A_{440}$ )	Y value ( $A_{545}$ )
170311200015	0.405	0.695
170311200039	0.315	0.533
170311200052	0.367	0.628
170311200135	0.445	0.738

OR

(a) Write down the basic principle of determination of pH of unknown buffer solution by using spectrophotometrically. (b) In presence of bromocresol green acid base indicator the absorbance of unknown buffer solution was measured spectrophotometrically at 410 and 630 nm as a means for the simultaneous determination of two species (acid and conjugate base form of the indicator) and the observed absorbance value were “X” and “Y” respectively, at each wavelength for a 1.00 cm cell. Calculate the pH of unknown buffer solution. [Given:  $pK_a$  value for bromocresol green is 4.77 ; Acid form of bromocresol green :  $A_{410}= 0.470$  and  $A_{630}=0.001$ ; Basic form of bromocresol green :  $A_{410}= 0.055$  and  $A_{630}=1.064$ ; The total concentration of bromocresol green is same all experimental solutions]

[5+10]

University Roll No.	X value ( $A_{410}$ )	Y value ( $A_{630}$ )
170311200017	0.458	0.012
170311200041	0.428	0.186
170311200076	0.104	0.789
170311200145	0.527	0.114

2. Viva Voce

[5]