647510 **BSCphyCC6030** **Seat No :_____**

B.Sc. Semester - 6 (*CBCS*) Examination
March/April -2019
PHYSICAL AND ANALYTICAL CHEMISTRY(CORE)

Time: 2:30 Hours **Marks: 70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que-1(A) What is ionic strength? Calculate ionic strength of 0.1M lanthanum nitrate solution. (4)

Que-1(B) **Answer any two questions** (10)

(1) Discuss Nernst heat theorem.

(2) Write the equation of Debye Huckel limiting law and explain its corrections.

(3) Calculate mean activity, mean concentration and activity (a_2) of 0.2 m solution of chromium nitrate if mean activity coefficient of the ions is 0.285.

Que-2(A) Write the cell reaction of Zn(Hg) (0.04 M) / $ZnSO_4$ (0.1 M) / Zn(Hg) (0.02 M) cell and calculate emf of the cell at 25° C. (F = 96500 coulomb, R = 8.14 Joule/mole) (04)

Que-2(B) **Answer any two questions** (10)

(1) Derive the equation for emf of electrolyte concentration without transference.

(2) Explain liquid junction potential and methods to eliminate it.

(3) Describe the determination of dissociation constant of weak acid by emf method.

Que-3(A) Define significant figure. Write 3.58 kg in mg and gm according to significant figure rule. (04)

Que-3(B) **Answer any two questions** (10)

(1) Describe the methods to eliminate the errors.

(2) Derive Gibbs Duhem equation and state its conclusion.

(3) Analysis of a sample found 41.61%, 41.27%, 41.70% and 41.64% silver. Find whether the value 41.27% can be rejected or retained. (Q – Table value is 0.829)

Que-4(A) Name the detectors of gas chromatography and explain any one of them. (04)

Que-4(B) **Answer any two questions** (10)

(1) Name the stationary phase of paper chromatography. Explain ascending, descending, two dimensional and circular paper chromatography.

(2) Describe column chromatography.

(3) State the properties of resin and factors affecting ion exchange.

Que-5(A) Explain the principle of charcoal cavity test with chemical reactions. (04)

Que-5(B) **Answer any two questions** (10)

(1) Explain glass electrode. Write its advantages and disadvantages.

(2) Describe argentometric titration by potentiometry.

(3) Explain pH- metry titration of weak acid against strong base and determination of dissociation constant of weak base.

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