647510 **BSCphyCC5030** **Seat No :_____**

B.Sc. Semester - 5 (Remedial) (*CBCS*) Examination
March/April-2022(Old Course)
PHYSICAL AND ANALYTICAL CHEMISTRY (CORE)

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

Instructions:

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

Q.1(A) **Answer the following question.** (04)

(1) Write a note on entropy change in spontaneous processes.

Q.1(B) **Answer any two questions out of three.** (10)

(1) Explain: Carnot Cycle with operations.

(2) Derive the equation of entropy change for mixing of ideal gases.

(3) Calculate the entropy change, when 1.5 mole of an ideal gas expand from volume 8 Lit. to 32 Lit. at 27 °C temperature (R = 1.987 Cal/°C·mole).

Q.2(A) **Answer the following question.** (04)

(1) Explain: Work function and it's physical importance.

Q.2(B) **Answer any two questions out of three.** (10)

(1) Derive the Gibbs-Helmholtz equation.

(2) Discuss the formation of one pair of partially miscible liquids in a ternary system.

(3) Derive Clausius-Clayperon equation for a phase in equilibrium.

Q.3(A) **Answer the following question.** (04)

(1) Discuss: Deviation from Beer's law.

Q.3(B) **Answer any two questions out of three.** (10)

(1) What is reference electrode? Explain Silver-Silver chloride electrode in detail.

(2) Discuss: Reversible and Irreversible cell with suitable example.

(3) Explain: Determination of equilibrium constant for cell reaction.

Q.4(A) **Answer the following question.** (04)

(1) Discuss: Conductometric titration curve for weak acid with strong base.

Q.4(B) **Answer any two questions out of three.** (10)

(1) Discuss: Replacement titration of salt of weak base (NH_4Cl) with strong base (NaOH) by conductometry.

(2) Explain: Principle of Metal ion indicators and give characteristics and uses of EBT indicator.

(3) Discuss: Precipitation titration curve of $BaCl_2$ by K_2SO_4 by conductometry.

Q.5(A) **Answer the following question.** (04)

(1) Discuss: Iodometric titration with any one example.

Q.5(B) **Answer any two questions out of three.** (10)

(1) Write a note on Mohr's method for precipitation titration.

(2) Explain the principle of Ostwald's law based on indicator.

(3) Explain: Neutralisation titration curve of strong acid and strong base.

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