

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BPHARM
BRANCH: PHARMACY

SEMESTER : IV
SESSION : SP/19

SUBJECT: BP403T PHYSICAL PHARMACEUTICS-II

TIME: 3.00 Hrs

FULL MARKS: 75

INSTRUCTIONS:

1. The missing data, if any, may be assumed suitably.
2. Before attempting the question paper, be sure that you have got the correct question paper.
3. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
4. This question paper consists of (03) three parts. Read the part wise instructions before attempting the questions..

PART-I

Objective types questions (Instruction: Answer all questions)

- Q.1.A Classify the dispersed system based on the size ranges of dispersed phase. [20]
- B. What is proposed as a measure of thixotropic breakdown?
- C. In case of association colloids of Polyoxyethylene lauryl ether and Dimethyldodecylammonio propane sulfonate, what would be the counter ions generally used for stabilization.
- D. What will be the viscosity of gas with decrease in temperature?
- E. Schulze-Hardy rule arranges the cations and anions in the order of their capacity to coagulate
- F. Define thixotropy.
- G. When sulphonamide is treated with acid or base in aqueous solution, precipitate is formed which is known as
- H. Write down the formula to measure sedimentation volume.
- I. Write down the definition and expression of fluidity.
- J. Write down the unit of Arsenious constant or frequency factor in SI system.

PART-II

Short Answers

(Instruction: Answer seven out of nine questions)

- Q2. The velocity of migration of an aqueous ferric hydroxide sol was determined at 20 °C using electrophoresis cell attached with ultramicroscope and was found to be 17.8×10^{-2} m/s. The distance between the electrodes in the cell was 0.21 m, and the applied emf was 0.38 statvolts. What is a) the zeta potential of the sol in volts unit; b) the sign of the charge on the particles?
- Q3. Discuss the theory of sedimentation in low solid content suspension and high solid content suspension.
- Q4. The sedimentation coefficient, "s", for a particular fraction of methyl cellulose at 20 °C is 6.14×10^{-17} h, the diffusion coefficient, D, is 14×10^{-7} cm²/s, the partial specific volume of the gum is 715 cm³/kg, and the density of water at 20 °C is 1 g/cm³. Compute the molecular weight of methylcellulose in g/mole. [35]
- Q5. Elaborate the measurement of thixotropy by various approaches.
- Q6. A centrifuge is rotating at 345 rps. The midpoint of the cell containing the sample is located 0.91 dm from the center of the rotor. What is the average angular acceleration and the number of 'g's on the suspended particles?
- Q7. Explain why suspension follows apparent zero order rate kinetics?
- Q8. Derive Heckel equation with mentioning the assumptions.
- Q9. The rate constant k_1 for the decomposition of 5-hydroxymethylfurfural (5-HMF) at 120 °C is 1.185 hr⁻¹, and k_2 at 140 °C is 4.526 hr⁻¹. What is the activation energy, E_a , in Kcal/mole and the frequency factor, A, in sec⁻¹ for the breakdown of 5-HMF within this temperature range?
- Q10. Describe the power law to classify the non-Newtonian fluid.

PART-III

Long Answers

(Instruction: Answer two out of three questions)

- Q11. Conceptualize the Donnan membrane equilibrium and explain how this concept would be utilized to increase the absorption of drugs. [20]
- Q12. Elaborate the detailed procedure to determine the order of a reaction by using "Half-life method".
- Q13. Discuss in detail pseudoplastic flow, dilatant flow and thixotropy.

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