

Level : B. Pharm.  
Year : III  
Time : 2 hrs. 30 mins

Course : PHAR 301  
Semester: I  
F. M. : 55

SECTION "B"

[5 Q. × 3=15 marks]

Answer *ANY FIVE* questions of the following:

1. Why are acid buffers preferred over basic buffer? Define dilution value of a buffer.
2. What are the limitations of Noyes Whitney equation for dissolution? List down the assumptions of Hixon-Crowell cube root method.
3. Classify complexes and write down the significant property of each class.
4. What is Eutectic point? Explain with suitable example.
5. Draw a well-labeled diagram of a particle showing Martine, Feret and Projected area diameter.
6. Write short note on 'Pharmaceutical applications of association colloids'.
7. Explain principle and pharmaceutical use of 'Donnan membrane equilibrium' with suitable example.

SECTION "C"

[5 Q. × 5 =25 marks]

Answer *ANY FIVE* questions of the following:

8. How does the dielectric constant of a solvent effect the rate of degradation of drug product?
9. Discuss about factors affecting dissolution of drug and factors affecting percutaneous absorption. Define steady state and sink condition.
10. Discuss about types of solvents and their mechanism of action.
11. A 1000 g mixture of partially miscible compound X and water has a total composition of 25% w/w of compound X at 50 °C. At that temperature the two conjugate phases has the respective composition of 60% and 40% w/w of water. Calculate the weight of the aqueous and the compound X layer in the mixture and the weight of compound X in each layer.
12. Explain the DuNouy Ring method for determination of interfacial tension.
13. What is Coulter counter? Explain principle and procedure for determination of particle distribution using the instrument.
14. Write down the reasons for physical instability of lyophobic colloids. Give your approaches for improving the physical stability.

Answer ANY TWO questions of the following.

15. a. Find activation energy ( $E_a$ ) using following information:



[5]

Rate Constant, $k$ (s <sup>-1</sup> )	Temperature (K)
$2.0 \times 10^{-3}$	298.15
$4.0 \times 10^{-3}$	308.15
$8.0 \times 10^{-3}$	318.15
$1.6 \times 10^{-3}$	328.15

- b. Find the half-life of a first-order reaction if the reaction constant,  $k$ , is  $2.0 \times 10^{-3} \text{ s}^{-1}$ . Find the time when only 1% of reactant remains. [2.5]
16. Write down the applications of complexation in pharmaceutical sciences. Explain about methods for determination of drug-protein binding. Plot the theoretical phase solubility diagram with all the possible plots that might result due to complexation. [2+4+1.5]
17. What is Thixotropy? How can you estimate thixotropy? Why study of thixotropic property of some pharmaceuticals preparation is important? Explain with suitable examples. [7.5]



