

M.A./M.Sc. Examination, 2019
Semester-IV
Mathematics
Optional Course: MMO-41(A08) (New Syllabus)
(Mathematical Pharmacology-II)

Time: Three Hours

Full Marks: 40

Questions are of value as indicated in the margin.

Notations and Symbols have their usual meanings.

Answer ***any four*** questions.

1. a) Define compartmental model on mathematical pharmacology. Obtain the concentration of drug in one compartment model with absorption when drug is intravenously injected. 1+4
b) What is meant by flow-limited compartment? Write down a two-compartment flow-limited model of an individual organ and find out the concentrations in each compartment. 1+1+3
 2. a) What is meant by drug binding and metabolism in compartment model? 4
b) Considering micro-vascular mixing tissue compartment, obtain the concentration of drug in a two-compartment stirred-tank pharmacokinetic model. 6
 3. What is meant by homogeneous and heterogeneous chemical reaction? Discuss the diffusion and chemical reaction inside a porous catalyst. 3+7
 4. Discuss the influence of changing interfacial area on mass transfer at the interface. Hence obtain the interfacial mass flux and the total number of moles of mass that have crossed the interface at any instant t . 10
 5. Obtain the total amount of drug leaving the membrane in case of diffusion through planar membrane for transdermal delivery. 10
 6. Discuss the pharmacokinetics of T-20 after intravenous administration and obtain the plasma concentration at steady state. 10
-