Ex/PG/PHAR/T/127A/2019

M PHARMACY FIRST YEAR SECOND SEMESTER EXAMINATION 2019

SUBJECT: PHARMACEUTICS II

Time 3 hours **Full marks: 100**

Answer Five questions

1 What do you mean by a formulation? Write about the different types of formulations. "Drug-excipients interaction is a very significant pre-formulation study"- justify the sentence. How will you investigate drug-excipients interaction using FTIR spectroscopy? How will you interpret physical and chemical interaction by FTIR- spectroscopy? How do you investigate and analyze chemical interaction of a mixture of drug and the excipients by DSC? Give the working principle of DSC.

2+3+3+4+3+3+2 = 20

2. How will you design a transdermal formulation? Give the process and significances of drug release study and drug skin permeation study of TDDS. Write the mechanism of skin permeation of drug in details explaining the reason(s) in each case. What is the advantage of using PSA polymers for TDDS? Describe the following tests with their significances.
Tack test, flatness. 4+5+5+2+4 = 20

3. What are vesicular formulations? Write their advantages and disadvantages. How will you develop nanosize vesicular drug delivery system? How are they stabilized? How are they generally endocytosed? Give the procedure and significances of CryoTEM method and D_2O method for nanovesicular formulation. Give the significances of AFM and SEM analysis, subject to characterize vesicles.

2+3+3+2+2+5+3 = 20

4. How will you determine IC_{50} values for a nanoparticle/ nanoliposomal formulation *in vitro*? How will you extrapolate the value to determine the dose for in vivo experiments in animals? How will you select a volunteer for a phase I study for TDDS? How will you select the area of application of TDDS for a phase I trial? For a dose, give the method of determination of MEC and TC of a drug in human volunteers.

5+4+4+2+5 = 20

5.A drug loaded nanovesicular formulation is administered in MCF 7, PC 3 and HEPG2 cells. How will you analyze cellular uptake qualitatively and quantitatively *in vitro*? How is tissue uptake investigated in vivo both qualitatively and quantitatively? Describe various animal models along with the methodology to investigate anticancer efficacy of formulation against liver cancer or breast cancer.

6+6+8 = 20

6. What do you mean by nanoparticles as a dosage form? Give the methods and significances of the following studies for the analysis of drug nanocarrier:
Particle size, zeta potential, polydispersity index, FESEM.
2+6+12= 20

7. What do you mean by blood brain Barrier (BBB)? Explain it. How will you design a formulation that can cross BBB? What do you mean by drug targeting? Explain some methods to deliver drug in vivo in a site-specific way.
5+6+3+6 = 20