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MANIPAL UNIVERSITY

FIRST YEAR M. PHARM. DEGREE EXAMINATION - JULY 2017
SUBJECT: MODERN PHARMACEUTICAL ANALYSIS (PQA 601T)
(SPECIALIZATION: PHARMACEUTICS/INDUSTRIAL PHARMACY/PHARM. QUALITY ASSURANCE/PHARM.BIOTHECHNOLOGY)
(2014 REGULATIONS)
Monday, July 17, 2017 (10.00 - 13.00 Hrs.)

Marks: 100 **Duration: 180 mins.**

Answer ALL the questions:

1A)	Explain the effect of solvent and crossed conjugation on absorption spectra with example.	(5)
1B)	Explain the Woodward-Fieser rules for Dienes.	(5)
2A)	Explain the instrumentation of Raman spectroscopy.	(5)
2B)	Why the vibrational frequency of C=0 shifts from its normal value in IR spectrum? Explain.	(5)
3A)	What is the scope of 'decoupling methods' in ^{13}C NMR spectroscopy? Explain.	(5)
3B)	Explain the causes for deshielding of aldehyde protons in ^{1}H NMR spectroscopy.	(5)
4A)	Explain the gas phase ionization techniques in mass spectroscopy and their applications.	(7)
4B)	What are M+1 ion peak, M+2 ion peak and metastable ion?	(3)
5A)	Explain any four mechanisms responsible for separation in chromatography.	(5)
5B)	Explain the variables that affects the column efficiency in a chromatographic separation.	(5)
6A)	Explain the columns and stationary phases in GC.	(5)
6B)	Explain the working of Electron capture detector.	(5)
7A)	Explain the theory and instrumentation of HPLC.	(5)
7B)	Explain the theory, process and applications of Ion-exchange HPLC.	(5)
8)	Explain the principle and applications of micellar electrokinetic chromatography in brief.	(10)

Write short notes:

9A)	Detection techniques in HPTLC.	(5)
9B)	Applications of Hyphenated techniques.	(5)

Write briefly on the following:

10A)	Merits and demerits of phosphorimetry over fluorimetry.	(5)

10B) Principle and experimental requirements for ELISA. (5)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION - JULY 2017
SUBJECT: BIOPHARMACEUTICS AND PHARMACOKINETICS (PCE 602T)
(SPECIALIZATION: PHARMACEUTICS / INDUSTRIAL PHARMACY / PHARM. QUALITY ASSURANCE)
(2014 REGULATION)
Friday, July 21, 2017 (10.00 - 13.00 Hrs.)

Marks: 100 **Duration: 180 mins.**

Answer ALL the questions:

1)	Explain the pharmacokinetics of a drug following two compartment open model when administered as an IV bolus.	(10)
2)	Explain the application of the sigma - minus method to determine the pharmacokinetics of drugs in urine administered by IV bolus assuming that it follows one compartment open model.	(10)
3)	Explain the determination of absorption rate constant of drug in blood by the method of residuals when administered by extravascular route assuming that it follows one compartment open model.	(10)
4)	Explain with examples the applications of pharmacokinetics on therapeutic drug monitoring.	(10)
5)	Discuss the evaluation of in vivo bioavailability data for modified release drug products.	(10)
6)	Describe the phase-1 oxidative reactions in biotransformation of drugs with examples.	(10)
7)	How pharmacokinetics and pharmacodynamics can be related? Explain	(10)
8)	How Vmax and Km are determined? Discuss at least two methods.	(10)

9. **Write short notes:**

9A)	Time-dependent pharmacokinetics.	(5)
9B)	Drug accumulation index 'R'.	(5)

10. **Write briefly on the following:**

10A)	Solubility and permeability criteria as per the BCS.	(5)
10B)	Importance of Ka and Tmax and AUC in Bioavailability.	(5)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION - JULY 2017
SUBJECT: ADVANCES IN DRUG DELIVERY SYSTEMS (PCE 603T)
(SPECIALIZATION: PHARMACEUTICS / INDUSTRIAL PHARMACY)
(2014 REGULATION)
(Monday, July 24, 2017 (10.00 - 13.00 Hrs.)

Marks: 100 **Duration: 180 mins.**

Answer ALL the questions.

1)	Briefly discuss different factors influencing the design of sustained release dosage forms.	(10)
2)	Write the principle, composition and general methods of preparation of matrix tablets.	(10)
3)	Mention different systems used in buccal muco-adhesive drug delivery and explain any TWO systems in detail.	(10)
4)	Discuss the evaluation aspects of liposomes in detail.	(10)
5)	Mention different evaluation tests for pulmonary drug delivery systems and explain any TWO important tests.	(10)
6)	Explain the principle, composition and evaluation aspects of effervescence based gastro-retentive systems.	(10)
7)	Give a detailed note on IUDs.	(10)
8)	What are different ADVANCED transdermal drug delivery techniques? Give a brief account on any TWO techniques.	(10)

9. **Write short notes:**

9A)	Approaches (Any TWO) to deliver protein/ peptide based drugs.	(5)
9B)	Applications of polymers in drug delivery.	(5)

10. **Write briefly on the following:**

10A)	Advantages and disadvantages of nanocarriers.	(5)
10B)	Ocuserts.	(5)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION - JULY 2017
SUBJECT: PHARMACEUTICAL PRODUCT DEVELOPMENT (PCE 604T)
(SPECIALIZATION: PHARMACEUTICS / INDUSTRIAL PHARMACY)
(2014 REGULATION)
Wednesday, July 26, 2017 (10.00 - 13.00 Hrs.)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Explain any FIVE applications of DSC with suitable examples.	(10)
2)	Write briefly about GRAS and Inactive Ingredient Database. Explain any THREE factors affecting selection of pharmaceutical excipients. (4+6 = 10 marks)	(10)
3)	Discuss the effect of prodrug and pharmaceutical salts on the solubility enhancement of drugs. (5+5 = 10 marks)	(10)
4)	Explain the role of QbD in generic drug development. Discuss QbD cycle. (3+7 = 10 marks)	(10)
5)	Enlist the official dissolution apparatus as per USP. Explain any two apparatus in detail. (2+8 = 10 marks)	(10)
6)	Discuss in brief the ICH Q1A guidelines.	(10)
7)	Explain the concept of hypothesis testing and types of errors with suitable examples. (5+5 = 10 marks)	(10)
8)	Describe the objectives of Response Surface Methodology (RSM) and experimental designs in RSM. (3+7 = 10 marks)	(10)

9. **Write short notes:**

9A)	Particle morphology study of drug substance in preformulation.	(5)
9B)	Process Validation.	(5)

10. **Write briefly on the following:**

10A)	Oxidative degradation of drugs.	(5)
10B)	Simplex method of optimization.	(5)