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SVKM'S NMIMS

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Programme: M. Pharm / M. Pharm + MBA (Pharmaceutics/PQA/PT/IP) **Year:** I **Semester:** I

Academic Year: 2019-20 **Marks:** 75

Subject: Modern Pharmaceutical Analytical Techniques **Time:** 2.00 pm to 5.00 pm

Date: 18 November 2019 **Duration**: 3 hrs.

FINAL EXAMINATION

Instructions: Candidates should read carefully the instructions printed on the question paper an the cover of the Answer Book, which is provided for their use.

1) Question No. 1 is compulsory (5 questions of 3 marks each)

2) Out of remaining questions, attempt any 4 questions (15 marks each)

3) In all 5 questions to be attempted (Compulsory)

4) All questions carry equal marks

5) Answer to each new question to be started on a fresh page

6) Figures in brackets on the right hand side indicate full marks

7) Assume Suitable data if necessary

Section A

Section A

1 a Why is TMS used as a reference in ^{1}H-NMR? 3

1 b What is APCI? 3

1 c Can ion exchange chromatography (IEC) be used in liquid phase? 3

1 d Enumerate different types of gel are used in Gel electrophoresis. 3

1 e Enlist wavenumber ranges for a) ketone; b) ester; and c) amide groups. 3

Section B

2 a Discuss fundamental molecular vibrations in IR spectroscopy. 5

2 b Explain the factors affecting relative positions of zones during adsorption in column chromatography 5

2 c What is Bragg's law? 5

3 a Enlist any four ionization modes in mass spectrometry. Explain principle of any one mode with suitable example(s). 5

3b i Enlist common name of TLC. In what way TLC is superior to other chromatographic techniques.

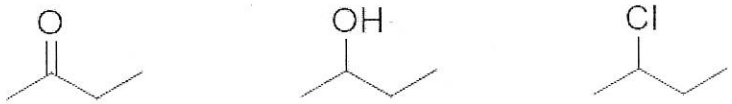
3b ii Enlist any three applications of NMR spectroscopy. 5

3 c Give the equation for electromotive force of the complete electrochemical cell. 5

4 a Discuss, in brief, salient features of ^{13}C-NMR spectroscopy. 5

4 b Give the masses of fragment ions (two each) for the following compounds – 5

i) ii) iii)



4 c Enlist any three applications of XRD in material sciences. 5

5 a Discuss the factors which affect the migration rate of ions in Paper Electrophoresis. 5

5 b Mention and discuss the factors which may affect the TG curves. 5

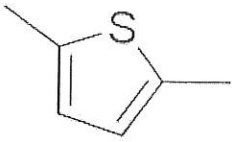
5 c State the scope of the TLC. What is the significance of the two dimensional TLC? 5

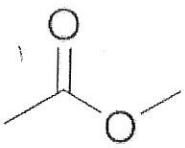
6 a Discuss, in brief, instrumentation of latest and commonly used UV/VIS spectroscopy. 5

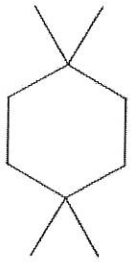
6 Give splitting patterns for any two types of protons in each of the following structures - 5

b

i) ii) iii)







6 c Explain methods of end point location in potentiometric titrations. 5

7 a What is Stokes shift? Explain its utility in analytical sciences with suitable example(s) 5

7b i Give the principle of following techniques.

i TLC

ii. Ion Exchange chromatography 5

7b ii What are the basic requirements for radioimmunological assay?

7 c What are isotopic peaks? Give at least one example. 5