

# SVKM'S NMIMS

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Programme: M.Pharm/M. Pharm + MBA (P'ceutics/PQA/PT/IP)

Year: I

Semester: I

Academic Year: 2019-20

Batch: 2018-2019

Marks: 75

Subject: Modern Pharmaceutical Analytical Techniques

Time: 10.00 am to 1.00 pm

Date: 09 December 2019

Duration: 3 Hrs

No. of Pages : 02

## RE EXAMINATION

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

- 1) Question No. 1 is compulsory.
- 2) Out of remaining questions, attempt any **FOUR** questions.
- 3) **In all FIVE questions to be attempted.**
- 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

- Q.1.**
- i) What is the effect of intramolecular H-bonding on the stretching and bending vibrations in IR spectrum? Give one suitable example. 3M
  - ii) Enlist any three applications of NMR spectroscopy. 3M
  - iii) Enlist any two chromatographic parameters for continuous chromatography. Give expression for at least one of these parameters. 3M
  - iv) What is rotating crystal method? Explain in brief. 3M
  - v) How will you determine the pKa of benzoic acid using potentiometry? 3M

### SECTION B

- Q.2.**
- i) Give salient features of electronic transitions in UV/VIS spectroscopy with suitable examples. 6M
  - ii) Discuss in brief the principle of FT-NMR using suitable illustration. 5M
  - iii) Mention the retention behavior (in terms of  $t_R$ ) of the following substances on a  $C_{18}$  column with a mobile phase of pH 3.0 – 4M
    - a) aniline
    - b) stearic acid
    - c) benzonitrile
    - d) dodecane
- Q.3.**
- i) Discuss mass fragmentation pattern of – 6M
    - a) allyl alcohol
    - b) ethyl methyl ketone and c) cyclohexanone

- ii) Discuss instrumentation of a Gas Chromatograph. Enlist at least four detectors used in GC instruments. 7M
- iii) What is TGA? 2M
- Q.4. i) Explain any two ionization modes in a Mass spectrometer. 7M
- ii) Discuss any three applications of spectrofluorimetry. 6M
- iii) Define: IEF 2M
- Q.5. i) Discuss the principle and applications of X-ray powder diffraction. 6M
- ii) Write a note on Bioluminescence assays. 6M
- iii) Explain the terms in the expression for Beer-Lambert law. 3M
- Q.6. i) Identify (i.e., write the name of): 3M
- a) Support matrix in GPC
- b) Cation-exchange resin
- c) One type of mass analyzer
- ii) Discuss any three important parameters affecting DSC thermogram. 6M
- iii) Distinguish between AES and AAS (any three relevant and mutually exclusive points) 6M
- Q.7. i) How will you separate mixture of methyl salicylate from salicylic acid using column chromatography? 4M
- ii) Discuss any three bonded phases used in HPLC with suitable examples. 6M
- iii) What will you do if – 5M
- a) You are asked to identify –OH proton in a molecule using  $^1\text{H-NMR}$ ?
- b) You are asked to find out the exact mass of an unionizable compound?
- c) You are asked to identify relative proportions of enantiomers from a given sample using TLC?
- d) You are asked to find out the nature of a polymorph in a given powder sample?
- e) You are asked to find out the melting behavior of a drug-polymer mixture?