

M. Pharm. 1<sup>st</sup> Year 2<sup>nd</sup> Semester Examination, 2024

Subject: Advanced Spectral Analysis

Subject Code: MPC201T

Full Marks: 75

Time: 3 Hr

Answer any five questions taking at least two from each groupGroup-A

- Q1. a) Discuss in detail about the factors influencing chromatography. 10  
 b) Write an account on silica particles used for chromatography and their properties. 5
- Q2. a) Write an account on Van Deemter Plot. 5  
 b) Discuss various detectors used in HPLC. 10
- Q3. a) Discuss various evaluation parameters of HPLC. 9  
 b) Write an account on column bleed of HPLC. 6
- Q4. a) Write an account on polarity index of mobile phase. 5  
 b) Write an account on various columns used in HPLC. 5  
 c) Write an account on typical HPLC pump. 5

Group B

- Q5. Discuss the critical role of sensitivity in heteronuclear NMR experiments. How do you enhance the sensitivity of X-nuclei through polarization transfer and inverse detection? Write in detail about HSQC experiment. 3+8+4 = 15
- Q6. Write in detail about the advantages of 2D NMR experiments. How are 2D NMR data recorded? Discuss the differences between homo-nuclear COSY and NOESY experiments with examples. 4+7+4 = 15
- Q7: Write short notes (any three) on (a) HMBC (b) bending vibrations (c) the significance of shape and intensity of IR peaks (c) combination and overtone bands in case of aromatic compounds 5 X 3 = 15
- Q8. How do you approach for the analysis of IR spectrum of an unknown compound? Discuss characteristic IR peaks for alkane and alcohols with different examples. 7+8 = 15