Medicinal Chemistry III (BP601T) I Sessional Examination
Date: 23/06/2025
Duration: 1 Hour
Total Marks: 30

Instructions
- Answer the questions in the respective sections as indicated.
- All questions in Section C are compulsory.
- Write neatly and legibly.

Section A: Elaborate on (Answer any ONE question) $1 \times 10 = 10$

1. (Analyzing) Discuss the structure-activity relationship (SAR) and mechanism of action of β-Lactam antibiotics, focusing on Penicillin and Cephalosporins. Explain how their chemical structure influences their antibacterial activity, including chemical equations for their synthesis.
2. (Evaluating) Evaluate the role of Quantitative Structure Activity Relationship (QSAR) in modern drug design. Provide examples of physicochemical parameters used in QSAR and explain how they contribute to predicting drug activity.

Section B: Write notes on (Answer any TWO questions) $2 \times 5 = 10$

1. (Understanding) Explain the historical background and classification of Tetracyclines, including their nomenclature and stereochemistry, with examples such as Tetracycline and Doxycycline.
2. (Applying) Describe the concept and applications of combinatorial chemistry in drug design, highlighting the differences between solid phase and solution phase synthesis.
3. (Understanding) Discuss the mechanism of action and chemical degradation of Aminoglycosides, such as Streptomycin and Kanamycin, with emphasis on their structure-activity relationship.

Section C: Short answers (Answer ALL questions) $5 \times 2 = 10$

1. (Remembering) Draw the structure of Penicillin and write its chemical name.
2. (Understanding) Explain why β-Lactamase inhibitors are used in combination with β-Lactam antibiotics.
3. (Remembering) Define pharmacophore modeling and provide one example.

4. (Understanding) Describe the role of partition coefficient in QSAR studies.

5. (Remembering) Write the chemical equation for the synthesis of Tetracycline.

End of Question Paper
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