MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2013/2014

THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCE; PHARMACEUTICAL SCIENCE AND MEDICAL BIOTECHNOLOGY WITH INFORMATION TECHNOLOGY

(MAIN CAMPUS)

PMT 313: BIOCHEMICAL TECHNIQUES II

Date: 11th April, 2014 Time: 8.30 – 10.45 a.m.

PMT 313: BIOCHEMICAL TECHNIQUES II

END OF SEMESTER EXAM DURATION: 2 HOURS

Section A (Short answer questions)

Answer all questions in this section. Clarity will be awarded.

1. Explain the principle of salt-induced protein precipitation technique. (4 marks)
2. Briefly describe practical application of X-ray crystallography (4 marks)
3. Explain any TWO advantages and disadvantages of radio-labeled immunoassays. (4 marks)
4. Describe any THREE factors you would control for during the separation of biomolecules using ion-exchange methods.
5. Explain how proteins are preserved during cell fractionation procedures. (4 marks)
6. Explain the principle of microarrays technique. (4 marks)
7. Give any FOUR objectives of a protein purification process. (4 marks)
8. Explain how you would use isoelectric focusing to characterize an enzyme. (4 marks)
9. List any FOUR major reagents in polyacrylamide gel electrophoresis. Give one functiond of each reagent list (4 marks)
10. Write short notes on the following:
    a) NMR spectroscopy (2 mark)
    b) Sedimentation constant (2 marks)

Section B (Essay questions)

Answer question 11 and ANY other question in this section.

11. A medical biotechnology student at Maseno University in characterizing a bacterial restriction enzyme that he wants to use to digest a DNA molecule. Discuss how the student would design a technique for analyzing the enzyme under the following:

    a) The properties of the enzyme to consider before its isolation process begins (5 marks)
    b) Methods of cell disruption he would use (5 marks)
    c) Purification method to be applied (5 marks)
    d) Quantification technique he would apply (5 marks)

12. Discuss centrifugation under the following

    a) Classes and uses of centrifuges (5 marks)

    b) Density gradient centrifugation (5 marks)

13. Discuss the determination of structure of a protein under the following:

    a) 2-D SDS PAGE (5 marks)

    b) Edman degradation (5 marks)