

**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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**University Examinations 2015/2016**

THIRD YEAR, FIRST SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE BIOCHEMISTRY AND BACHELOR OF SCIENE BIOLOGICAL

**SCH 3203: LABORATORY TECHNIQUES**

**DATE: NOVEMBER, 2015 TIME:** $2 $**HOURS**

**INSTRUCTIONS:** *Answer question* ***one COMPULSORY*** *and any other* ***two*** *questions.*

**QUESTION ONE – (30 MARKS)**

1. Describe briefly the following terms; (10 Marks)
2. Aqua regia
3. Bioharzard level four organisms
4. Specrophotometry
5. Equipment calibration
6. Standards
7. Explain the meaning of the following with regards to buffers. (4 Marks)
8. Ka
9. pH
10. Kw
11. pKa
12. State the different classes of hazardous chemicals in a laboratory. (5 Marks)
13. A solution of amino acids tyrosine and tryptophan has an absorbance of 0.65 at 280nm an d0.50 at 295nm in a 1 cm cuvette. Given the extinction coeffiecients of the pure amino acids calculate the concentration of tyrosine and tryptophan present in the mixture

(4 Marks)

|  |  |
| --- | --- |
| Wavelength (nm) | Molecular extinction coefficient l mo$l^{-1}cm^{-}$ |
| 280295 | Tyrosine Tryptophan1500 5002500 2500 |

(ii) State four main causes of deviations from Bear Lambert’s law (4 Marks)

1. List the different sets of protective clothing that are used in the laboratory(3 Marks)

**QUESTION TWO (20 MARKS)**

1. Discuss using specific examples, at least five main classes of dangerous substances or preparations associated with a chemical hazard symbol or code. (10 Marks)
2. State the principle behind the following terms; (10 Marks)
3. Bluret assay
4. Lowry method
5. Bradford method
6. Bicinchonic acid assay (BCA)
7. Spectrophotometry

**QUESTION THREE (20 MARKS)**

A researcher has cultured some bacterial cells and would wish to analyze the DNA. Describe an experiment how the DNA would be extracted and determine the purity of the same DNA.

(20 Marks)

**QUESTION FOUR (20 MARKS)**

1. Describe the layout of a lab highlighting the functions of the different facilities present in the lab. (10 Marks)
2. Discuss the various glassware and equipment present in the lab highlighting the functions of each. (10 Marks)