

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF MASTER OF SCIENCE IN CHEMISTRY

CHEM 818: APPLICATION OF INORGANIC CHEMISTRY IN INDUSTRY AND BIOTECHNOLOGY

STREAMS: BSC (CHEM)

TIME: 3 HOURS

DAY/DATE: MONDAY 06/04/2020

11.30 A.M. – 2.30 P.M.

INSTRUCTIONS: ANSWER ALL QUESTIONS

QUESTION ONE (20 MARKS)

- a) Give the two common classification of dyes and give one advantage of each (2 marks)
- b) i) Using an example discuss azo dyes with the azo chromophore (3 marks)
ii) Briefly describe the general synthesis method of azo dyes (3 marks)
- c) Discuss briefly three major points to consider during a scaling up a microbial or fermentation process (6 marks)
- d) Define a composite (1 mark)
- e) Explain nanocomposites briefly (2 marks)
- f) Discuss three advantages of nano materials (3 marks)

QUESTION TWO (20 MARKS)

- a) Briefly discuss the following dyes (6 marks)
 - i) Reactive dyes
 - ii) Disperse dyes
 - iii) VAT dyes
- b) Discuss two diazotization methods with industrial use for azo dyes (4 marks)

CHEM 818

- c) Using an example give the classification of nanomaterials depending on their size and shape (4 marks)
- d) Briefly explain the two main approaches for the preparation of nanomaterials (2 marks)
- e) Give four advantages of anthraquinone dyes (2 marks)
- f) List the advantages of sonochemical synthesis of nanomaterials (2 marks)

QUESTION THREE (20 MARKS)

- a) Discuss three environmental concerns on the use of biotechnology (6 marks)
- b) Write short notes on the following nanoparticle synthesis methods (6 marks)
- Sol-gel method
 - Co-precipitation method
 - Microwave –assisted synthesis
- c) List the four operation sequence in dye and their intermediate manufacture (2 marks)
- d) Discuss quantum dots and give their applications (3 marks)
- e) Name the following dye chromophores (3 marks)

