



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

MASTER OF SCIENCE IN CHEMISTRY

ACH 5104: NANOPARTICLES AND APPLICATIONS

SPECIAL/ SUPPLIMENTARY EXAMINATIONS

SERIES: SEPTEMBER 2018

TIME: 3HOURS

DATE: Pick Date Sep 2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **SIX** Question(s). Attempt any **FOUR** questions.

Do not write on the question paper.

Question ONE

- a) Define i) Liposomes (5 marks)
- ii) Quantum dots (5 marks)
- iii) Dendrimers (5 marks)
- iv) Nanorods (5 marks)
- v) Superparamagnetic nanoparticles (5 marks)

Question TWO

- a) Differentiate between Nanotools and Nanodevices (10 marks)
- b) Differentiate between nano fibres and nonotubes enzyme immobilization techniques (7 marks)
- c) Differentiate between microscopic and macroscopic techniques for characterization (8 marks)

Question THREE

- a) Discuss any five (5) classes of Nanoparticles (5 marks)

- b) Discuss the properties of nanoparticles (10 marks)
- c) Describe the serious health threat exhibited by nanoparticles via human organs (10 marks)

Question FOUR

- a). Differentiate between reactive bioprocessing and extractive bioprocessing (5 marks)
- b). Describe the basis of separation in bioseparation processes (10 marks)
- c) Discuss
- i) Particle-liquid separation (5 marks)
 - ii) Particle-particle separation in liquid medium (5 marks)

Question FIVE

- a) Discuss the methods used in synthesizing nanoparticle (5 marks)
- b) Discuss any five (5) applications of:
- i) silver nano particles (10 marks)
 - ii) Gold nano particles (10 marks)

Question SIX

- a) Discuss the disadvantages of nanomaterial (10 marks)
- b) i) Define biofunctionalised implants (2 marks)
- ii) State any four (4) application of biofunctionalized implants (8 marks)
- c) State the three categories of nanostructured materials (5 marks)