(*University of Choice*)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

(MAIN CAMPUS)

UNIVERSITY EXAMINATIONS 2018/2019 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATIONS

FOR THE BACHELOR OF SCIENCE IN MEDICAL BIOTECHNOLOGY

COURSE CODE: BMB 424

COURSE TITLE: NANOTECHNOLOGY

DATE: **TIME:**

INSTRUCTIONS:
ANSWER ALL QUESTIONS IN SECTION A, B AND C
TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

SECTION A: MULTIPLE CHOICE QUESTIONS **[10 MARKS]**

1. Which one of the following statements is true regarding incidental nanomaterials
   (a) Involves nnanofoam with equivalent dimensions
   (b) Constitutes micro gold controls
   (c) Deal with hydrolysable peptide fragments
   (d) Include ultrafine fullerness

2. In the utility fog
   (a) Nano objects exhibit 4D outliers
   (b) Nano foam have chemically distinct regions
   (c) Physical objects are replaceable
   (d) Metal based concepts are modified

3. Select an agent focused upon in supramolecular chemistry
   (a) Legumain agents are processed
   (b) Complex synaptics are assessed
   (c) Non-covalent interactions are critical
   (d) Fire produce complexing reactions

4. Current nano-optics involve
   (a) 535 nm wavelength activities
   (b) Endocyclin genetics
   (c) Puromysin based nanomaterials
   (d) Systemic motilin provision

5. Select an agent typically important alongside optic chiasma operations
   (a) Lateral geniculate
   (b) Genicular matrix
   (c) Delta SNAP
   (d) NF Kappa-B

6. Incidental atmospheric nanoparticles
   (a) Perform ssupramolecular array nano-optics
   (b) Are components of the utility fog
   (c) Are nanorobotic targets
   (d) Constitute ultrafine agents

5. Nano-composites used in nanotechnology
   (a) Are 3D and optically located
   (b) Shed non-covalent capabilities
   (c) Possess chemically distict regions

(D) Are ultrasonically dependent

6. One important effect of exploding wire method

(a) Nano-primed simulation

(b) Tracking detection

(c) Aluminium vaporisation

(d) Solid state microfluidics

9. Consolidated NEMS

a) May emanate from solid state asemblies

b) Are promoted via single-molecule interactions

c) Are inclusive of biomimicry

d) Curtail magnetoresistance

10. X-ray diffraction in nanosciences

a) Dipolar ECG

b) Bipolar graphical D_x timing

c) Integrates diffraction process

d) Handles crystal structure

11. The area of micromeritics

a) Balances fine particle concepts

b) Include Watson-Crick model interaction

c) Is applied in covalent binding

d) Promotes controlled application

12. Janus particles

(a) Permeate nanoplate tructures

(b) Regulate cell effect via nanocomplexing

(c) Make wavelength-dependent fullerness

(d) Stabilize emulsions in nanoscience

13. The use of Watson-Crick fundamentals

(a) Effectslectronic energy limits

(b) Is Janus particle size driven

(c) Delivers bottom-up nanotructures

(d) Potentiates microsynthetic nanoformations

14. A 1D nanostructure

(a) Exhibits a single-atom cross section

(b) Has 20 single layers

(c) May Constitute an ellipsis

(d) Is nanotransparent

15. Graphene characterisation

(a) Contrtuct modifiable nanostructures

(b) Produce nanofoams

(c) Form allotropic sheets

(d) Are exemplified in nasturtium

16. Box-shaped graphene research predominantly involve

(a) Protection of fluid-characterised nanoeffects

(b) Cooling off exiting plasma contents

(c) Multilayer 3D system

(d) Concentration of light-scattering emissions

17. In spray pyrolyis

(a) Ultrasonic nozzles are utilised

(b) Applications are done in arc plasma radiation

(c) Covers ion implantation

(d) Will catalyse Endostatin effect

18. Naolithography in nanotechnology

(a) Regulates beam epitaxy

(b) Includes silicon nanotube dimension

(c) Entails atomic force microscopy

(d) Is controllable via HCM nanorobots

19. Spectrocopic technology

(a) Can be microscopy-coupled

(b) Is Brunauer-Emmett-tailored

(c) I hazardous via skin contact

(d) K^+ are first to enter

20. Nanospheric agent

a) Are detectable via scanning probes

b) Are NMR-analysed

c) Have neurogenetic applications

d) Have amorphous origin

SECTION B: SHORT ANSWER QUESTIONS **[40 MARKS]**

1. Describe radiolysis and inert gas condensation methods in nanoparticle synthesis **(5 marks)**
2. Explain the thermal plasma delivery **(5 marks)**
3. Distinguish between nanofoam and nanoporous materials **(5 marks)**
4. What engineered sources of nanomaterials **(5 marks)**
5. Distinguish between scanning tunneling and atomic force microscopy used in nanotechnology **(5 marks)**
6. What are incidental nanomaterials **(5 marks)**
7. Outline The Richard Feyman vision of miniature factories **(5 marks)**
8. What is involved in nanobiotechnology **(5 marks)**

SECTION C: LONG ANSWER QUESTIONS **[40 MARKS]**

1. Describe current uses of medical nanorobots **(10 marks)**
2. Discuss fullerness and its applications **(10 marks)**
3. Discus the larger to smaller and simpler to complex molecular perspective in nanosynthesis **(20 marks)**