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MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUSES

UNIVERSITY EXAMINATIONS 2019/2020 ACADEMIC YEAR

4TH YEAR 2ND SEMESTER EXAMINATIONS

FOR THE BSc DEGREE OF MEDICAL BIOTECHNOLOGY SPECIAL/SUPPLEMENTARY EXAMINATION

COURSE CODE: **BMB 424**

COURSE TITLE: **NANOTECHNOLOGY**

DATE: 19th October 2020 **TIME:** 11.00 AM -1.00 PM

INSTRUCTIONS TO CANDIDATES

This paper is divided into three sections, **A B** and **C,** carrying respectively: Multiple Choice Questions (**MCQs**), Short Answer Questions (**SAQs**) and Long Answer Questions (**LAQs**).
TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

SECTION A
Answer All Questions (20 Marks).

1. ----------is used in early clinical trial for drug delivery for treatment of patients with advanced and untreatable cancer
   a) Minicells
   b) Amino acid
   c) histidine
   d) X ray

2. Which one of the following is not an exmple of non polymer used in nanotechnology.
   a) Quantum dots
   b) Carbon nanotubes
   c) micelles
   d) silica nanoparticles

3. Which one of the following is an example of polymer used in nanotechnology
   a) Quantum dots
   b) Carbon nanotubes
   c) micelles
   d) silica nanoparticles
4. The following feature describes the structure of dendrimers except
   a) Core moety
   b) External unit
   c) Globular structure
   d) Internal cavities

5. Which among the following technique is used to measure activity of the brain
   a) EEG
   b) ECG
   c) CT
   d) EMG
6. Which one of the following is an example of nanomaterial used in ultrasound to increase contrast
   a) dendrimer
   b) Liposome
   c) super-paramagnetic
   d) gold nanoparticles

7. Which one of the following is an example of nanomaterial used in MRI to increase contrast
   e) Liquid perflurocarbon
   f) liposome
   g) super-paramagnetic
   h) gold nanoparticles

8. Which of The following device work on the principle of antigen –antibody reaction

a) ECG
b) MRI
c) ELISA
d) Microarry

9. Which one of the following device is used to measure eye pressure

a) tonometry
b) spirometry
c) ECG
d) EEG

10. Which one of the following device is used to measure lung functionality
a) tonometry
b) spirometry
c) ECG
d) MRI

11. Which one of the following is an example of electro diagnosis devices
a) ECG
b) EMA
c) ECC
d) MRI

12. Which one of the following was the discovery of Wilhelm Conrad rontgen in 1895?
a) X-ray
b) MRI
c) CT
d) ultrasound

13. Which of the following is an example of nano device used to alter the allergy or immune response
a) Vitamin E
b) Histamine
c) Bulky ball
d) Quantum dot

14. ----------oxide nanoparticles can decrease the antibiotic resistance and enhance antibacterial activity of ciprofloxacin

a) zinc
b) calcium
c) phosphate
d) magnesium

15. ----------is nanoparticles that carry payload of antibiotics at its core to target bacterial infection in the body
a) Abraxane
b) doxorubicin
c) cremophor
d) polyethylene

16. An albumin bound paclitaxel, nano particle used for treatment of breast cancer is called? .
    a) Abraxane
    b) Doxorubicin
    c) Cremophor
    d) polyethylene

17. Among the following factors, which one does not affect functionality of enzyme nanobiosensor?

    a) PH
    b) Temperature
    c) Buffer
    d) Time

18 Which one of the following scientist was the first to formulate the term nanotechnology
    a) Taniguchi
    b) S.Lijima
    c) Feynman
    d) Drexler

19. Which of the following structural molecule is used in the delivery of bioactive particles to macrophages and liver?

    a) Liposomes.
    b) Dendrimers
    c) Silver
    d) Gold

20. Which of the following analyte is used in clinical diagnosis of hypoxa?
    a) Lactase.
    b) Uric acid.
    c) Blood
    d) Oxygen

SECTION B
Answer All Questions (40 Marks).

1. Using a well labeled diagram briefly state the component of biosensor (8 Marks).
2. Discus the two approaches applied in production of nanomaterial (8 Marks).
3. State the properties of nanomaterial (8 Marks).
4. List example of electrochemical biosensor (8 Marks).
5. Using relevant example describe in brief about electro diagnosis (8 Marks).

SECTION C
Answer All Questions (40 Marks).

1. Briefly discuss nano-biosensor based on bio recognition element (20 Marks).
2. Discuss in detail application of the nanotechnology in drug delivery (20 Marks).
3. Briefly discuss the following nanoparticles a) Magnetic nanoparticles b) grapheme oxide c) carbon nanotube d) carbon nanotube (20 marks).