



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR**

THIRD YEAR SECOND TRIMESTER EXAMINATIONS

**FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN BIOTECHNOLOGY**

COURSE CODE: BMB 323

**COURSE TITLE: ETHICS, RISKS AND TRENDS IN
BIOTECHNOLOGY**

DATE: 11th December 2020

TIME: 8.00 -10.00 AM

INSTRUCTIONS TO CANDIDATES

This paper consists of three sections:

- i. Section A – Multiple Choice Questions
- ii. Section B – Short Answer Question
- iii. Section C – Long Answer Question.

Answer all questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 5 Printed Pages. Please Turn Over.



Section A: Multiple Choice Questions (20 marks)

Choose the most suitable choice, only one choice is correct

Section A MCQs 20 marks

1. Which of the following is a form of harm that might be suffered by research participants?
 - a. Physical injury
 - b. Stress and anxiety
 - c. Impaired development
 - d. All of the above
2. Why is it important that personal data about research participants are kept within secure, confidential records?
 - a. So that the participants cannot find out what has been written about them.
 - b. In case individuals, places, or organizations can be harmed through identification or disclosure of personal information.
 - c. So that government officials, teachers, and other people in authority can have easy access to the data.
 - d. To enable the researcher to track down individuals and find out more about their lives.
3. Which method is most commonly associated with a lack of informed consent?
 - a. Qualitative content analysis
 - b. In-depth interviewing
 - c. Covert observation
 - d. Structured interviewing
4. Why is it "easier said than done" to ensure that the principle of informed consent is adhered to?
 - a. It is not practicable to present every participant with all the information about the study.
 - b. Sometimes it is desirable to withhold certain pieces of information, such as the length of time an interview will take.
 - c. If the participants knew exactly what the researcher was intending to study, they might change their behavior.
 - d. All of the above.
5. Apart from the fact that it is "not a nice thing to do", what is an important ethical disadvantage of deceiving participants?
 - a. It can damage the professional reputation of the researcher and their discipline.
 - b. It makes it more difficult to gain access to deviant or hidden populations.
 - c. It means that records of personal data about the participants cannot be made anonymous.
 - d. None of the above.
6. Which of the following is an example of deception in business research?
 - a. The obtaining of company material without permission.
 - b. The researcher wearing a disguise during an observation.
 - c. The researcher representing their research as being about a different topic.
 - d. The researcher failing to ask permission to interview someone.
7. What problem does a research organization face when drawing up an ethical code?
 - a. Identifying relevant legislation that should guide behaviour.
 - b. Reflecting the difficulty of making truly ethical decisions.

- c. Incorporating assessments for the ethical behaviour of participants.
 - d. All of the above.
8. An instructor is teaching medical students about principles of ethics in health care, and she tells them that the utmost important principle to observe while taking care of patient is doing no harm. The principle of Ethics she described here:
- a. Beneficence
 - b. Justice
 - c. Nonmaleficence
 - d. Respect for autonomy
9. A researcher tries to invent new vaccine for cancer cure, he injects himself cancer cells to see its impact on human blood chemistry and then through his own blood samples will further progress to synthesize vaccine for prevention of occurrence of fatal cancer. The theory and principle of ethics go parallel here are:
- a. Beneficence and theory of virtue ethics.
 - b. Fiduciary and principlism theory of ethics.
 - c. Justice and Kantianism theory
 - d. Respect for Autonomy and critical theory.
10. A famous movie star after suffering fracture of his cervical two and cervical three vertebrae due to an accident became quadriplegic; he is paralyzed below neck. He made his advance directive that clearly states that he no longer wanted to live a life of persistent vegetative state and so he wants physician assisted suicide. His family is against his decision and wanted to make him live that way and hope for further research in stem cells and genomics will find cure for his quadriplegic state. Ethical consideration in decision making for that movie star will include:
- a. An integrated model: coherence theory
 - b. Bottom up models: cases and inductive generalization.
 - c. Four quadrant approach: Aristotle virtue theory
 - d. Principlism and common morality theory
11. A 25 years old healthy male dies in a fatal road traffic accident; he has advance directives about his organ donations. Health care rationing of organs take multiple factors into account for deciding of who will be recipient of organ. Social utility, equity, equality, distributive justice, beneficence and expected life expectancy after organ transplantation ,all perspectives play roles in allocating of scarce organs to recipients, as waiting lists are lengthy and decision is tough. The most likely recipient of organ will be:
- a. A 45 years alcoholic with irreversible liver failure.
 - b. A 75 years old female with extreme form of dementia and end stage renal failure.
 - c. A 35 years young entrepreneur with acute renal failure.
 - d. A 40 years old female with heart failure and HIV positive.
12. Ms Maria, a 34 years old female, comes to emergency reception (ER) with her 20 days old baby boy, suffering a lesion in his groin. Mother tells that her baby is not his usual active. Baby has Mycoscoriasis fungal infection of neonates. ER physician on physical examination finds baby alert, pink and active; sends him back to home. Although Nurse in ER had noticed the lesion in groin and suspects that her previous experience is that such lesions in neonates, if not treated timely, led to fatal outcomes. Baby returns in ER after 24 hours with many lesions on his trunk,

severe breathlessness, cyanosed and unconscious. Health care providers were liable to commit the form of harm to the patient:

- a. Advertent negligence
 - b. Assault
 - c. Inadvertent negligence
 - d. Malpractice
13. A 35 years old male, athlete admits with pain in Right knee, investigations reveal that he is suffering from end stage osteosarcoma, and needs extensive chemotherapy, radiotherapy to treat the cancer. Athlete's father died with osteosarcoma in his fifties. His mother died due to breast cancer in her forties. He has a living will that if he ever diagnosed with cancer, not wanted to be aggressively treated by chemotherapy, radio therapy and other therapies. Physician is consistent to treat him with all sorts of treatment possible to cure his cancer. Physician is exercising:
- a. Act of Paternalism
 - b. Ideal beneficence
 - c. Obligatory beneficence
 - d. Specific beneficence
14. A 30 years old pregnant woman with 37 weeks of gestation admits in maternity ward with complaints of starting labor pains, she is human immunodeficiency virus (HIV) positive. Her previous two children are HIV positive. She delivers healthy baby boy weighing 3.5Kg. She is not willing to test her baby for HIV screening and left the ward against medical advice. To save public from preventable HIV transmission, policies developed by health care policy makers must address the policy:
- a. Compulsory and voluntary screening for HIV for all.
 - b. Mandatory HIV screening of all newborns.
 - c. Mandatory screening of all pregnant women for HIV.
 - d. Mandatory screening for HIV for all irrespective of low and high risk groups.
15. A 2 days old baby girl is admitted in neonatal intensive care unit; she is suffering from early onset neonatal sepsis accompanied with multi organ failure. She has to put on mechanical ventilator support; her respiratory status is moderately working, pupils are fixed dilated, motor and sensory responses are absent and her heart is having regular sinus rhythm. Physician counsels parents, about brain death; and explains that it is of no use to keep the baby alive with evident brain death, and asks for parents' permission to put off the artificial mechanical support. But, Parents are stubborn to continue life support. Social and ethical principles come in conflict with health care system are:
- a. Cost related to futile treatment and medical concerns.
 - b. Parents' wishes and futile medical treatment
 - c. Respect for autonomy of surrogate decision maker.
 - d. Religious and cultural beliefs to not to end life.
16. County General Hospital Peponi, is having a large number of unreported incidents of needle stick injuries and workplace violence and no reporting system and compensation for health care providers is in place for such incidents. As contrast patients are well protected against harassment and spread of Hepatitis B and C infections. Victims of maleficence here are:
- a. Communities
 - b. Employees

- c. Families
 - d. Patients
17. The National Institute of Health and Care Excellence definition of infertility is:
- a. Failure to conceive at a time of one's choosing
 - b. Failure to conceive for a period of two years
 - c. Failure to conceive after frequent unprotected sexual intercourse for one to two years in couples in the reproductive age group
 - d. Failure to conceive after frequent unprotected sexual intercourse for ten years in couples in the reproductive age group
18. Pre-implantation genetic diagnosis is:
- a. A way of creating designer babies
 - b. Regulated by the common law
 - c. Used for sex selection for social reasons
 - d. A way of screening embryos to ascertain their genetic composition prior to implantation
19. The main purpose of reproductive cloning is to _____.
- a. Extract somatic cells
 - b. Extract stem cells
 - c. Create a cloned individual from somatic cells
 - d. Create a cloned individual from stem cells
20. Why is therapeutic cloning considered controversial?
- a. It creates a cloned human
 - b. It can be used to treat many medical diseases and disorders
 - c. It uses somatic cells from an embryo that is allowed to die after they are extracted
 - d. It uses stem cells from an embryo that is allowed to die after they are extracted

Section B: Short Answer Question 40 marks

1. Outline the medical codes in Medical practice (8marks)
2. Explain the significance of Medical ethics (8marks)
3. Describe the theoretical ethical approaches applied in bioethics (8marks)
4. Explain ethical issues in gene therapy in modern society (8marks)
5. Explain the ethical principles applied in public health (8marks)

Section C: Long Answer Question 60 marks

1. Discuss the recent trends in biotechnology (20marks)
2. Describe the ethical issues outlined in "The Assisted Reproductive Technology Bill, 2019" in Kenya Constitution
3. Discuss basic ethical principles and concepts of importance for prenatal diagnosis