

UNIVERSITY OF ESWATINI
FACULTY OF SCIENCE AND ENGINEERING
DEPARTMENT OF BIOLOGICAL SCIENCES
MAIN EXAMINATION PAPER 2020/2021

COURSE CODE: BIO411
TITLE OF PAPER: MODERN TRENDS IN BIOLOGY I
TIME ALLOWED: THREE (3) HOURS
INSTRUCTIONS: NUMBERS IN BRACKETS DENOTE THE NUMBER OF MARKS

THIS PAPER COMPRISES OF **THREE SECTIONS**.

SECTION A COMPRISES OF 2 QUESTIONS (50 MARKS). SECTION B COMPRISES OF 15 QUESTIONS (15 MARKS). SECTION C COMPRISES OF 5 QUESTIONS (35 MARKS). ANSWER ALL QUESTIONS IN SECTIONS A, B AND C.

SECTIONS B AND C CAN BE ANSWERED IN THE SAME BOOKLET. ANSWER SECTION A IN A SEPARATE BOOKLET.

CLEARLY INDICATE THE SECTION AND QUESTION NUMBER ON YOUR ANSWER PAPER.

NO ADDITIONAL MATERIAL (E.G. NOTES, CALCULATORS ETC) MAY BE TAKEN INTO THE EXAMINATION.

DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE CHIEF INVIGILATOR

Section A

Total marks available: 50

Answer TWO questions from this section.

AQ1: Explain the major reasons for the emergence and re-emergence of new infectious diseases to humans. Discuss the methods that are available for identifying and controlling these diseases. [25]

AQ2: Using selected immunologic techniques, explain how certain diseases in humans can be diagnosed and treated serologically. [25]

AQ3: Write an essay on the role of industrial microbiology in the socio-economic development of the Kingdom of Eswatini. [25]

NOW USE A SEPARATE BOOKLET TO ANSWER SECTIONS B AND C

Section B

Total marks available: 15

There are eleven (11) questions in this section and a total of 15 marks available. Some questions may have more than one answer. Answer **ALL** the questions in this section

BQ1: Cancer is most likely to occur in

- a) Animals only; plants do not get cancer
- b) Humans only; no other species (plant or animal) gets cancer
- c) Humans who give birth many times and breastfeed (breast cancer)
- d) Larger mammals (of the same species)
- e) Larger mammals (of different species)

BQ2: Bats have been linked to which human disease?

- a) HIV
- b) Nipah virus
- c) Malaria
- d) Syphilis
- e) Cervical cancer

BQ3: Sexual activity among members of the same sex is:

- a) a human construct and does not occur in nature
- b) common among livestock ready to breed, such as cows
- c) Japanese macaques
- d) Layson albatrosses
- e) None of the above

BQ4: Lordosis is

- a) a signal of dominance prior to fighting
- b) an indication of submission / defeat during fighting
- c) a sign of sexual availability
- d) an infection that affects cats and sealions
- e) a type of parasite that affects dragon flies

BQ5: Animals have been known to masturbate to

- a) Reduce sexual frustration
- b) Improve sperm quality
- c) Advertise to potential mates
- d) Reduce sexually transmitted infections
- e) Animals do not masturbate

BQ6: Erectile dysfunction can occur due to

- a) Exposure to high levels of testosterone in utero
- b) Fear of predator as seen in ungulates
- c) Stress of inferiority as seen in lemurs
- d) All of the above
- e) None of the above

BQ7: HIV-2 is thought to have been first transmitted to humans by:

- a) Hunting and consumption of SIV infected chimpanzees for meat
- b) Hunting and consumption of SIV infected sooty mangabey monkeys for meat
- c) Drinking water contaminated with faeces from SIV infected bats
- d) Drinking water contaminated by faeces from SIV infected pigs
- e) Hunting and consumption of SIV infected wild pigs and bats for meat.

BQ8: Zoonotic tuberculosis typically infects 150,000 humans each year. It is caused by:

- a) *mycobacterium avium* and it is mainly transmitted to humans by chickens
- b) *mycobacterium tuberculosis* and it is mainly transmitted to humans by chickens
- c) *mycobacterium tuberculosis* and is mainly transmitted to humans by rodents
- d) *mycobacterium bovis* and it is mainly transmitted to humans by wildebeests
- e) *mycobacterium bovis* and it is mainly transmitted to humans by cattle

BQ9: Metastatic lung cancer is

- a) breast cancer cells that have spread to the lung
- b) lung cancer cells that are present in the lung
- c) lung cancer cells that have spread to another organ
- d) all of the above
- e) none of the above

BQ10: Which animal is the cause of most deaths to humans?

- a) Mosquitoes
- b) Snakes
- c) Snails
- d) Rats
- e) Humans

BQ11: Cancer can be caused by

- a) Fungus
- b) Carcinogens
- c) Viruses
- d) All of the above
- e) None of the above

Section C

Total marks available: 35

There are four (4) questions in this section. Answer **ALL** the questions in this section

CQ1: With the aid of examples, explain ONE cause of re-emerging infectious diseases and how we can use One Health to control such diseases. [10]

CQ2: Briefly describe THREE possible reasons why the planet is getting 'fatter'. [6]

CQ3: Describe ONE sexual behavior seen in animals that is pathologized in human. [4]

CQ4: Through the use of an example, describe the six degrees of interconnectedness. [5]

CQ5: Explain the ONE Health Triad concept and why it is beneficial to the economy. [10]

END OF EXAMINATION