

BIO422 (M) 2019/2020

UNIVERSITY OF ESWATINI

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT OF BIOLOGICAL SCIENCES

MAIN EXAMINATION PAPER 2019/2020

COURSE CODE: BIO422

TITLE OF PAPER: MODERN TRENDS IN BIOLOGY II

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. SECTION B COMPRISES OF 15 QUESTIONS. SECTION C COMPRISES OF 4 QUESTIONS. 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

There are two (2) questions in this section. Answer **ALL** the questions in this section

AQ1: Distinguish between transgenesis and mutagenesis. With reference to a specific grain crop, explain how these scientific developments may contribute to food security. [25]

AQ2: Consider the products of wheat and describe possible attributes that you might pursue in a breeding programme of the wheat (*Triticum aestivum*) crop. [25]

NOW USE A SEPARATE BOOKLET TO ANSWER SECTIONS B AND C

Section B

Total marks available: 15

There are fifteen (15) questions in this section. Answer **ALL** the questions in this section

BQ1: ONE health is an interdisciplinary field comprising of which fields? [1]

- a) Medicine, Ecology, Veterinary and Microbiology
- b) Public health, Environmental health, Animal health and Nutrition
- c) Medicine, Chemistry, Ecology and Economics
- d) Public health, marine biology, economics and international relations
- e) Global health, Cancer biology, Sexual reproductive health and Engineering

BQ2: Bats have been linked to which human disease [1]

- a) Tuberculosis
- b) HIV
- c) Malaria
- d) Ebola
- e) Cervical cancer

BQ3: SARS-CoV-2 is thought to have crossed into humans from which host? [1]

- a) Orangutans
- b) Pangolins
- c) Leopards
- d) Rhinos
- e) Domestic chickens

BQ4: Flehmen response is used to [1]

- a) Signal dominance prior to fighting
- b) Indicate submission / defeat during fighting
- c) Identify weaver nests ready for inspection
- d) Mourn loss of an elephant
- e) Show sexual availability or prowess

- BQ5: When a female mare raises her tail to a male this is called [1]
- a) Therophilly
 - b) Fibroelastasis
 - c) Lordosis
 - d) Metastasis
 - e) Baculum
- BQ6: Erectile dysfunction can occur due to [1]
- a) Stress of inferiority as seen in lemurs
 - b) Fear of predator as seen in ungulates
 - c) Exposure to high levels of testosterone in utero
 - d) All of the above
 - e) None of the above
- BQ7: Obesity is associated with [1]
- a) Gut bacteroidetes
 - b) Intestinal shortening
 - c) Disruption of circadian rhythms
 - d) All of the above
 - e) None of the above
- BQ8: Cancer is most likely to occur in [1]
- a) Larger mammals (of different species)
 - b) Larger mammals (of the same species)
 - c) Humans who give birth many times and breastfeed (breast cancer)
 - d) Humans only; no other species (plant or animal) gets cancer
 - e) Animals only; plants do not get cancer
- BQ9: HIV-1 is thought to have been first transmitted to humans by: [1]
- 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.
- BQ10: Latent tuberculosis is [1]
- a) Infectious and curable
 - b) Not infectious and curable
 - c) Infectious but not curable
 - d) Not infectious and not curable
 - e) Does not occur in humans
- BQ11: Zoonotic tuberculosis typically infects 150,000 humans each year [1]
- a) it is caused by *mycobacterium tuberculosis* and is mainly transmitted to humans by rodents
 - b) it is caused by *mycobacterium tuberculosis* and it is mainly transmitted to humans by chickens
 - c) it is caused by *mycobacterium avium* and it is mainly transmitted to humans by chickens
 - d) it is caused by *mycobacterium bovis* and it is mainly transmitted to humans by cattle
 - e) it is caused by *mycobacterium bovis* and it is mainly transmitted to humans by wildebeests

- BQ12: Zoonotic diseases are [1]
- a) fungal
 - b) parasitic
 - c) bacterial
 - d) viral
 - e) all of the above
- BQ13: Which animal is the causes the most deaths to humans? [1]
- a) Mosquitoes
 - b) Snakes
 - c) Snails
 - d) Humans
 - e) Sharks
- BQ14: Cancer can be caused by [1]
- a) Carcinogens
 - b) Viruses
 - c) Fungus
 - d) All of the above
 - e) None of the above
- BQ15: Climate change [1]
- a) Has nothing to do with humans
 - b) Means increased 'tropical diseases' outside of the tropics
 - c) Means decreased 'tropical diseases' outside of the tropics
 - d) Mainly affects plants due to changes in rain fall patterns
 - e) None of the above
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Section C

Total marks available: 35

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

- BQ1: Describe FIVE threats to the planet's health. [10]
- BQ2: List THREE zoonotic infectious diseases (including the pathogen) of human medical importance. [6]
- BQ3: Describe THREE benefits of female promiscuity in animals. [10]
- BQ4: Explain what this means "A/pig/London/42/95 (H2N1)" and the illness it causes. [9]
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END OF EXAMINATION