



CRAWFORD UNIVERSITY
FAITH CITY, IGBESA, OGUN STATE

2021/2022 HARMATTAN SEMESTER EXAMINATIONS

COLLEGE: NATURAL AND APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

PROGRAMME: MICROBIOLOGY

COURSE CODE: MCB 309

COURSE TITLE: BACTERIA DIVERSITY

COURSE UNIT: 3

INSTRUCTION: ANSWER QUESTIONS 1 & 2 WITH ANY THREE

TIME ALLOWED: 3 hrs

1. Your patient is a 30-year-old man with a 2-cm lesion on his arm. It began as a painless papule that enlarged, within a few days, ulcerated and formed a black crust. He works in an abattoir where his job is removing the hide from the cattle. A Gram stain of fluid from the lesion reveals large gram-positive rods.
 - a. Which bacterium is most likely the cause of this infection? **1 mks**
 - b. Describe the laboratory diagnosis of the organism **5mks**
 - c. Pathogenesis is based primarily on the production of two exotoxins, name them **2mks**
 - d. Briefly explain each of the exotoxins listed in c above. **4mks**
 - d. Differentiate between pulmonary anthrax and cutaneous anthrax **3mks**

2. Diagrammatically describe the bacterial cell **2mks**
 - b. Explain the functions of any five cell organelles in (a) above **10mks**
 - c. Differentiate between the Gram positive and Gram negative cell walls of bacteria **3mks**

3. A male patient complained of urethritis with yellow, creamy pus and painful urination.
 - a. What is the likely cause of this infection? **1mk**
 - b. Discuss any four of the antigenic structures **8mks**
 - c. what are the clinical manifestations in a female infected with the same agent. **1mk**

4. Describe the genus *Mycoplasma* **1mk**
 - b. Describe the culture and unique growth appearance of *Mycoplasmas* on solid media **2mks**
 - b. List six characteristics of the genus *Mycoplasmas* **3mks**
 - c. List the four species that cause human infections with the infections they cause **4mks**

5. Describe *Chlamydiae* and list the three species that infect humans with the infections they cause **4mks**
5b Write extensively on the developmental cycle of the *Chlamydiae* **6mks**

6. Your patient is a 25-year-old woman who complains of a cough for the past month. The cough is now productive of several tablespoons of blood-streaked sputum per day. The sputum is not foul-smelling. An acid-fast stain of the sputum reveals acid-fast rods. Culture of the sputum shows no growth at 7 days, but buff-colored colonies are visible at 21 days.
 - a. What is the probable cause of this infection? **1mk**
 - b. Name and describe the test to confirm your answer in (a) above **5mks**
 - c. List six (6) examples of media formulations that can be used to grow the suspected organism. **3mks**
 - d. Is there any known vaccine to prevent the infection? If yes, what is the name of the vaccine? **1mk**

7. Describe the genus *Clostridium* **2mks**
 - 7b. Discuss the pathogenesis and pathology of *Clostridial* species **8mks**