THE UNIVERSITY OF ZAMBIA

SCHOOL OF MEDICINE

DEPARTMENT OF PATHOLOGY AND MICROBIOLOGY

PTM 4210/ PTM 3510 ASSIGNMENT 1

2023/2024 ACADEMIC YEAR

DATE: 26TH MARCH 2024

DUE DATE: TUESDAY 2nd April 2024 by 14:00.

All submissions to be made in hand-written format and submitted through the Class representative.

PART 1. 10 marks

1. Mercy lifts weights. Her muscles enlarge. This is a description of which adaptation? .....
2. Cynthia presents to hospital with excessive menstrual bleeding. A biopsy of the endometrium shows increase in the number of glands relative to the stromal cells. Which adaptation describes this process?.....
3. Michael suffers from gastroesophageal reflux disease. An endoscopy of his lower esophagus shows a change from squamous to columnar epithelium. Which adaptation is described here?
4. Mwewa is a baby born to an HIV-infected single mother. The mother cannot produce enough milk. Mwewa was examined by the doctor, who notes that the baby has severe wasting in his muscles in addition to his skin pealing off. What adaptation is described here and what is the underlying mechanism?
5. The process by which cells die during menstruation is called ?.....
6. Name the gene that is responsible for sensing cellular damage and initiating a process of cell death that typically does not induce inflammation.....
7. Lipofuscin is also known as .....pigment
8. Anthracotic pigment is to .....as Hemosiderin is to.....
9. What is the difference between Hemosiderosis and Hemochromatosis
10. Describe the two types of calcifications

PART 2. 80 marks

1. Describe ischemic-reperfusion injury. 10 marks
2. Describe the mechanisms of chemical injury. 10 marks
3. Describe ischemic and hypoxic cell injury. 10 marks
4. Describe free radicals and their effect on cells. 10 marks.
5. Describe ER stress. 10 marks.
6. List the four mechanisms for intracellular cellular accumulations. 10 marks
7. Describe the molecular steps in the intrinsic pathway of Apoptosis. 20 marks

PART 3

8. Clinical scenario. 20 marks.
   James Brown was admitted to the hospital for a fracture (brake) of the femur. His orthopedic surgeon explained that after they conduct open reduction and internal fixation (ORIF), he (James) would be discharged. However, in a dramatic turn of events, James's condition becomes worse. He develops a fever, but laboratory test results do not point to a particular explanation for his fever. Unfortunately, James dies after four days. An autopsy (post-mortem examination) is conducted by a pathologist. There is no explanation for James's death.

   An examination of hospital where James was admitted reveals that there was an old room next to James's ward which had that housed some radioactive material. Investigations reveal that the machines had been emitting radiation, and this could explain James's death.

   In a paragraph or two. Explain how radiation could have led to James's death and what was happening at a cellular level.

The End