

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2014/2015**

**SPECIAL/SUPPLEMENTARY EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE**

**TM 3110: CELL ORGANIZATION, STRUCTURE AND FUNCTION**

**DATE: April 2015 TIME: 3 HOURS**

**INSTRUCTIONS: Answer Any FOUR Questions**

1. a. Describe the central Dogma (3marks)

b. The tree of life is divided into Bacteria, archea and eukaryotes; Name two members of each category together with their special features and habitat. (6marks)

c. Shortly describe the salient features of the mitochondria (5marks)

d. Shortly describe the general structure of a eukaryotic cell. (11marks)

1. a. Name two Polar amino acids and two no-polar amino acids. (4marks)

b. With an example describe a protein domain. (5marks)

c. Describe how proteins may interact with one another. (6marks)

d. Discuss the role of protein Kinases and Phosphatases in cellular function. (10marks)

1. a. Describe the Okazaki fragment synthesis mechanisms. (5marks)

b. Describe the Enzyme complex at the replicative fork in E.coli (10marks)

c. Discuss DNA repair strategies (10marks)

1. a. Describe mechanisms of splicing (15marks)

b. Describe how transcription factors open up gene promoters (10marks)

1. Discuss the roles played by APC/C and SCF in the cell cycle control system. (25marks)
2. a. Describe how the caspase proteolytic cascade is initiated (10marks)

b. Name two initiator caspases and two executioner caspases. (4marks)

c. Describe the extrinsic pathway of apoptosis (11marks)