UNIVERSITY COLLEGE LONDON

UNIVERSITY OF LONDON

EXAMINATION FOR INTERNAL STUDENTS

FOR THE FOLLOWING QUALIFICATIONS:

B.Sc. *(Intercal)*

Orthopaedics 3003: Skeletal Tissue Biology

COURSE CODE : ORTH3003

DATE : 27-MAY-05

TIME : 10.00

TIME ALLOWED : 3 Hours

05-C1008-3-50

TURN OVER

SECTION A

Answer **TWO** questions out of the following **THREE** (25 marks per question)
Use diagrams to illustrate your answer where appropriate

Answer each question in a **SEPARATE** book

1. Describe the hierarchical arrangement of the collagen component in tendon and ligament in relation to the mechanical properties of these structures.

2. Discuss the role that osteoblasts play in the control of bone resorption.

3. Describe the age related changes which occur in articular cartilage and outline how exercise may influence these events.

TURN OVER

SECTION B

Answer **SIX** questions out of the following **EIGHT** (5 marks per question)
Use diagrams to illustrate your answer where appropriate

In a **NEW ANSWER BOOK** answer each question starting on a **NEW PAGE** of the book

1. List the three different types of cartilage. Briefly describe each type giving an example of where it can be found in the body.

2. Draw a diagram of the large proteoglycan aggrecan illustrating and labeling the different domains of the molecule. Briefly state the function of each of these domains.

3. Outline 4 ways in which the activities of the matrix degrading, matrix metalloproteinase (MMPs) enzymes are regulated.

4. Illustrate using a diagram how an integrin links the extracellular matrix to the cytoskeleton.

5. Outline the principles behind the sodium doecyl sulphate polyacrylamide gel electrophoresis (SDS PAGE) technique for separation of proteins of different sizes.

6. Write short notes on the features of a tissue biopsy from the central core of the Achilles tendon from an old professional elite athlete.

7. List four molecular markers for osteoporosis explaining briefly why each may be used.

8. Outline the mechanism by which the intervertebral disc receives its nutrition stating how this may be compromised leading to disc degeneration.

 END OF PAPER