UNIVERSITY COLLEGE LONDON

UNIVERSITY OF LONDON

EXAMINATION FOR INTERNAL STUDENTS

FOR THE FOLLOWING QUALIFICATIONS:

M.Sc.

Orthopaedics 3003: Skeletal Tissue Biology

COURSE CODE	**:**	**ORTH3003**
UNIT VALUE	**:**	**0.50**
DATE	**:**	**13-January-06**
TIME	**:**	**10.00**
TIME ALLOWED	**:**	**3 Hours**

05-C0017-1-50

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. How is endochondral ossification controlled in the growth plate?

2. The matrix metalloproteinases are a family of enzymes. Discuss this statement and describe the domain structure of MMPs and the function of each domain.

3. Describe the formation of elastic fibres and contrast this with collagen fibrillogenesis.

TURN OVER

SECTION B

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

Answer each question starting on a **NEW PAGE** of the answer book

1. Outline five differences between tendons and ligaments.

2. Fibronectin and Laminin are two extracellular, cell adhesion proteins. Draw a simple stylized diagram of each molecule indicating one structural similarity and one structural difference. How do they differ in where they commonly occur?
   Which do you think is more associated with sessile cell binding and which with cell migration (illustrate with example cell types in each case).

3. Give five disadvantages of conducting experiments on cells grown in an *in vitro* culture environment.

4. List five investigations which may be undertaken if Osteoporosis is expected and give a brief justification for each.

5. The cytoskeletal elements, Microfilaments and Microtubes each have both mechanical support and mobility functions. With the help of diagrams, explain Microfilament force generation and Microtubule transport function, naming specific accessory proteins linked to one example in each case.

6. List the five stages associated with bone remodelling and briefly describe each event taking place.

7. List the four zones of articular cartilage and briefly describe the cell morphology and cell arrangement in each zone.

8. Sulphated glycosaminoglycan (GAG) concentration can be measured using a spectrophotometric assay with the dye dimethylmethylene blue (DMB). What would happen to the assay kinetics if either the DMB or GAG were in great excess?

END OF PAPER