

**UNIVERSITY COLLEGE LONDON**

**UNIVERSITY OF LONDON**

**EXAMINATION FOR INTERNAL STUDENTS**

**FOR THE FOLLOWING QUALIFICATIONS:**

**M.Sc.**

**M.Sc. Orthopaedics: Paper III (Basic Sciences)**

**COURSE CODE : ORTH0007**

**DATE : 12-MAY-05**

**TIME : 10.00**

**TIME ALLOWED : 3 Hours**

05-N0169-3-30

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**TURN OVER**

## All questions carry an equal number of marks

You must answer **FOUR** questions

You must answer at least **ONE** question from each section

Use diagrams to illustrate your answers

Answer each question in a **SEPARATE** book

### SECTION A

1. You have been asked to design a replacement for the anterior cruciate ligament. Write an account of the structure / function relationships that will be important in the design specification for your construct.
2. "Knowledge of the molecular composition and cellular events in skeletal tissues has influenced the development of diagnostic techniques and novel treatments for skeletal tissue injury and disease". Discuss this statement with reference to potential molecular markers for osteoporosis and matrix metalloproteinase inhibitors for treatment of osteoarthritis.

### SECTION B

3. What biomechanical and biological factors may affect the long-term and short-term performance of a cemented and uncemented primary total hip replacement, and how could these be improved? (Your answer should address the issue of implant fixation, wear, and bearing surface et al)
4. Finite Element Analysis, laboratory testing and animal study are the main methods for pre-clinical evaluation of new implant design. Discuss the strength of using each method in testing wear, fatigue, implant fixation and tissue reaction.

### SECTION C

5. **Efficacy and Safety of human parathyroid hormone (1-84) in increasing bone mineral density in postmenopausal osteoporosis**  
**Hodsman AB, Hanley DA, Ettinger MP, Bolognese MA, Fox J, Metcalfe AJ, Lindsay R**

J Clin Endocrinol Metab. 2003 Nov; 88(11):5212-20.

You have been chosen to present this paper in a journal club. Summarise the strengths and weaknesses of the study as bullet points. Write down two lists. Each list should contain five to ten points. In approximately 200 words identify how the results of this study should inform clinicians and researchers about the effectiveness of PTH in the management of post menopausal osteoporosis.

6. Write a short article suitable for publication in New Scientist (a general science publication that is targeted at and written at a level appropriate to be understood by a non-specialist science graduate) entitled "*Muscle design makes it impossible to be both a sprinter and an endurance athlete*".

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