JANUARY EXAMINATIONS 2006

Subject: BIOLOGICAL SCIENCES
BSc SS. Med.Genetics.II. Med.Biochem.II.

Title of Paper: BS2009 – GENOMES

Time Allowed: Three hours

Instructions to candidates

Answer THREE questions

Use a separate book for each question

CANDIDATE NUMBER ………………………………….

DESK NUMBER ………………………………………

DO NOT REMOVE ANY OF THESE PAPERS FROM THE EXAMINATION ROOM

As this is an actual exam paper, we cannot provide the answers here. Please email the University of Leicester for the answers by selecting this link and stating clearly which exam year you require the answers for.

Exam Answers
1. Describe a strategy that could be employed to produce a representative genomic library that could be screened to identify a functional bacterial gene. Highlight any features that would be useful in the cloning vector used to make the library.

2. Why is DNA replication semi-discontinuous?

3. What are the respective molecular defects in Xeroderma Pigmentosum and in Hereditary Non-Polyposis Colorectal Cancer patients?

4. Describe the construction and screening of a cDNA library for which you already have a part length cDNA that can be used as a probe.

5. Describe the ways in which repeated sequences can be generated in eukaryotic genomes.

6. Compare and contrast the mechanisms of transposition of P elements in *Drosophila melanogaster* and TY elements in yeast.

7. Provide short answers to 3 of the following questions:
   
i. Briefly describe the steps involved in the amplification of a target DNA sequence using the polymerase chain reaction.

   ii. Outline the steps involved in a transcriptome analysis of *Saccharomyces cerevisiae* grown in two different environmental conditions.

   iii. Outline the role of apoptosis in maintaining genetic stability.

   iv. Outline the role of cell cycle checkpoints in maintaining genetic stability.

   v. Explain the genetic basis of the blue-white X-gal colony screening method used during gene cloning in *E. coli*.

   vi. Outline the analysis and the use of Expressed Sequence Tags (ESTs).