Summer Examinations 2016

SLS200116N

Module Title: Genes and Genomics
Level: Five
Time Allowed: Two hours

Instructions to students:

- Enter your student number **not** your name on all answer books.
- Answer **two** out of **five** questions.
- All questions are equally weighted.
- Begin each question in a separate answer book; label each answer book clearly with the number of the question you are answering.
- Neither books nor notes may be taken into the examination.
- Students are **not** permitted to remove this examination paper from the examination room. For all purposes the examination paper remains the property of the University of Northampton.

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Answer **two** of the following questions:

1. You are a genetic counsellor for a female carrier of Duchenne muscular dystrophy (DMD). She is pregnant with the child of an unaffected male. Using your knowledge of the inheritance pattern of DMD, how would you demonstrate to the mother the different possible reproductive outcomes and the probability that their child will be affected with DMD?

2. Discuss the genetic and environmental factors that might predispose to hypertension.

3. Discuss how you would conduct an experiment to establish whether or not a genetic polymorphism within the promoter region of a human gene results in a change in mRNA expression. In giving your answer assume that you have full access to any laboratory facilities along with access to human subjects and/or human tissue. You should also include details of how you might quantify any changes in expression that you observe.

4. Discuss how the process of carcinogenesis might occur within human cells or tissue.

5. Discuss the concept of genetic association and describe in detail how this concept can be used to further our understanding of disease processes. In giving your answer you should include details of the benefit and possible limitations of genetic association studies and you should include, where appropriate, relevant examples from the literature to support your answer.

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