**ST MARY’S UNIVERSITY**

**TWICKENHAM, LONDON**

MSc Degree Examination students registered for

Level **SEVEN**

Title**: Nutrigenomics**

Code: **HNU7029**

Semester: **TWO**

Date: **May 23rd 2019**

Time: **9:30 – 12 noon**

TIME ALLOWED: **TWO** HOURS **THIRTY** MINUTES

Please answer all multiple choice questions (2 marks each) and two essay questions (40 marks each).

**Section A:**

Answer all questions in this section. There is one correct answer for each question (2 marks each). **Please answer all questions in your answer booklet.**

**Multiple choice questions (answer ALL)**

1. A nonsense mutation results in the:
2. substitution of one amino acid for another in the protein made by a gene.
3. shortened protein that may function improperly or not at all.
4. substitution of one amino acid in the gene made by a protein.
5. an elongated protein that may function improperly or not at all.
6. Universal methyl donor involved in DNA methylation is:
7. 5-methyltetrahydrofolate
8. S-adenosylmethionine
9. Vitamin B12
10. Choline
11. Hunger Winter Family studies revealed that:
12. The risk of metabolic syndrome is increased if mother is exposed to malnutrition in the last trimester of pregnancy
13. The risk of metabolic syndrome is increased if mother is exposed to malnutrition in the first trimester of pregnancy
14. The risk of metabolic syndrome does not depend on whether a mother is exposed to malnutrition during pregnancy
15. The risk of metabolic syndrome depends on father’s diet during adolescence
16. Familial hypercholesterolaemia occurs when:
17. A large section of the lipoprotein lipase gene is missing
18. A large section of the lipoprotein lipase gene is added
19. A large section of the low density lipoprotein receptor gene is missing
20. A large section of the low density lipoprotein receptor gene is added
21. Which of the following genes has been shown to interact with protein intake and moderate the percentage of body fat?
22. FTO
23. MC4R
24. CD36
25. All of the above
26. Which of the following IS a post-transcriptional RNA modification:
27. Capping
28. Splicing
29. Polyadenylation
30. All of the above
31. Which of the following is correct for a nucleosome:
32. Nucleosomes are formed by wrapping DNA around histone proteins
33. Nucleosomes protect DNA and allow it to be packaged in the nucleus
34. Nucleosomes are a structural unit of a chromosome
35. All of the above.
36. The main stages in DNA extraction are?

a. Cell lysis, protein removal, DNA binding, washing of the DNA and DNA elution.

b. Cell lysis, protein removal, DNA binding, washing of the DNA and DNA electrophoresis.

c. Cell lysis, protein removal, primer binding, washing of the DNA and DNA elution.

d. Cell lysis, protein removal, DNA binding, washing of the DNA and RNA elution.

1. The strongest evidence to support the reduction of sodium intake in prevention of high blood pressure comes from:
2. Cross-sectional studies such as Intersalt
3. Randomised controlled trials such as DASH-sodium trial
4. Meta-analyses of randomised controlled trials
5. Prospective cohort studies
6. Normotensive salt-sensitive individuals:
7. Have cumulative mortality rates similar to salt-sensitive hypertensive individuals
8. Have cumulative mortality rates similar to salt-resistant hypertensive individuals
9. Have lower cumulative mortality rate than salt-resistant normotensive individuals
10. Both a and b are correct

**Section B:**

Answer **TWO** questions from this section(40 marks each).

1. Critically discuss the available evidence that links salt intake with hypertension (20 marks). Emphasise potential gene – diet interactions in salt sensitivity of blood pressure (20 marks).
2. Provide a comprehensive overview of epigenetics processes and how they may affect gene expression (20 marks). Discuss the evidence supporting the role of diet in epigenetics and disease development (20 marks).
3. Critically discuss available evidence on gene-environment interactions in obesity (40 marks).

**END OF EXAMINATION**