**ST MARY’S UNIVERSITY**

**TWICKENHAM, LONDON**

MSc Degree Examination students registered for

Level **SEVEN**

Title**: Principles of Nutrition 2**

Code: **HNU7024** Semester: **ONE**

Date: **[Exams will add this]** Time: **[Exams will add this]**

TIME ALLOWED: **TWO and a HALF** HOURS

**Section A: Answer all questions in this section, there is one correct answer for each question (1 mark each)**

1. During starvation, the Krebs cycle becomes less able to oxidise acetyl CoA. Why is this?
   1. Rising glucose levels inhibit acetyl CoA.
   2. Oxaloacetate is diverted to gluconeogenesis.
   3. Elevated insulin promotes conversion of acetyl CoA into TAG.
   4. All of the above.
2. What enzyme mediates the uptake of triacylglycerol into the adipose tissue?
   1. Hormone sensitive lipase
   2. Pancreatic lipase
   3. Lipoprotein lipase
   4. Insulin
3. What are the two key enzymes involved in the conversion of non-carbohydrate precursors into triacylglycerol (de novo lipogenesis)?
   1. Fatty acid synthase and acetyl CoA carboxylase
   2. Fatty acid synthase and insulin
   3. Acetyl CoA carboxylase and malonyl CoA
   4. Lipoprotein lipase and fatty acid synthase
4. Which of the following statements best characterises glycolysis?
   1. An efficient process of energy production
   2. First step in the catabolism of glucose
   3. A process only found in eukaryotes
   4. An energy-producing process that occurs in the mitochondria
5. In the electron transport chain
   1. Coenzymes receive hydrogen atoms from NADH2 and FADH2.
   2. Oxidized molecules gain energy at the expense of reduced molecules.
   3. Oxidative phosphorylation takes place and ATP is formed.
   4. A and C only
6. During prolonged physical activity, which biochemical process creates glucose (to be utilised in the muscle) from non-glycogen sources?
   1. Glycolysis
   2. Gluconeogenesis
   3. Glycogenesis
   4. Lipogenesis
7. Glucose can be converted to fat but fat cannot be converted to glucose because:
   1. Three steps of glycolysis are irreversible
   2. AcetylCoA cannot be converted to lactate
   3. AcetylCoA cannot be converted to pyruvate
   4. Acetyl CoA cannot be converted to citrate
8. Transamination is the process by which:
   1. An amino group is attached to a Keto-acid
   2. An amino acid is broken down
   3. An amino group is attached to an enzyme
   4. An amino acid is converted into energy
9. A nucleotide is comprised of:
   1. Repeating sugar phosphate molecules
   2. A phosphate, a sugar and a nitrogenous base
   3. DNA
   4. A purine and a pyrimidine
10. According to Chargaff’s rule, cytosine must be paired with:
    1. Adenine
    2. Uracil
    3. Thymine
    4. Guanine

**Section B: Answer all questions in this section (10 marks each)**

1. Describe the process of translation during protein synthesis.
2. Describe how the electron transport chain functions.
3. Describe the functions of pancreatic lipase, hormone sensitive lipase and lipoprotein lipase.

**Section C: Answer one question from this section (60 marks)**

1. Compare the metabolism of carbohydrate, fat and protein in the different phases of fuel use (well fed state, fasting state, early starvation, starvation, prolonged starvation). Include the influence of hormonal regulation in your answer.
2. Explain the biochemical processes that take place when blood glucose levels increase and cellular requirements for energy have been met. Provide a detailed description of metabolic pathways.