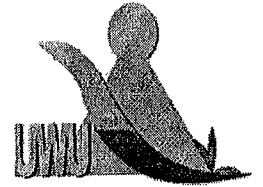


Uva Wellassa University, Sri Lanka
End Semester Examination – March 2011
SCT 323-1 Metabolism



Time: One (01) hour

Total 05 Questions

Answer four (04) questions including the question number one (01).

1.

- a) Briefly explain the major steps of how gluconeogenesis is induced hormonally and enzymatically when the blood glucose level becomes low. (08 marks)
- b) A group of students designed an experiment to find out the possible metabolic pathways of glucose - 6 - phosphate in mammalian body. Therefore, they injected radioactive labeled glucose - 6 - phosphate with ^{14}C into the blood of laboratory rats. After eight hours, the radioactivity of the body tissues was analyzed. Imagine that you are a member of that group and predict the possible metabolic pathways that radioactive labeled glucose - 6 - phosphate can move. (Note- illustrate atleast three metabolic pathways including all the intermediates) (17 marks)

2.

- a) Name the amino acids which cannot be synthesized and also not be required by adult human body. (04 marks)
- b) Briefly explain the importance of transamination. (06 marks)
- c) Aspartame is a food additive which may be toxic for Phenylketonuriac (PKU) people. Briefly explain how aspartame accumulation becomes toxic to the people who got PKU. (15 marks)

3.

- a) State the difference between photophosphorylation and phosphorolysis. (05 marks)
- b) Name the major enzymes which are used to break down the major storage polysaccharide in human. (08 marks)
- c) Discuss the major steps of storage polysaccharide synthesis in human. (12 marks)

4.

a) Patients in shock often suffer from lactic acidosis. One treatment for lactic acidosis is to administer dichloroacetate.

i. What is lactic acidosis? (04 marks)

ii. Briefly explain the prevention mechanism for lactic acidosis which is taken place spontaneously in human body. (12 marks)

iii. What would happen if you inject dichloroacetate? (03 marks)

b) State the steps in oxidative and non oxidative pentose phosphate pathway. (06 marks)

5.

a) Why more energy can be derived per gram of fat than per gram of carbohydrate?

(06 marks)

b) What is the energy usage for fatty acid synthesis? (03 marks)

c) Sub cellular separation of biochemical pathways allows the coexistence of two opposing, yet parallel, pathways in the same cell. Use fatty acid biosynthesis and fatty acid oxidation to illustrate this point. Indicate the points in which these pathways have parallel, yet opposite, effects. (16 marks)