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HARMATTAN SEMESTER EXAMINATION

BCH 307: Metabolism of Lipids — **Time Allowed: 3 hrs**

Instructions: Answer question ONE and ANY OTHER TWO questions — **4th November, 2014**

1 (a) List the four reactions of the beta- oxidation pathway for the metabolism of fatty acid.

(b) Calculate the energy yield in terms of ATP molecules for the complete oxidation of stearic acid to CO_2 and H_2O in the mitochondria.

2 (a) What are ketone bodies? Give the organ and the pathway leading to their production.

(b) Compare and contrast fatty acid oxidation and fatty acid synthesis.

(c) What is the overall function of the acyl carrier protein (ACP) and coenzyme A in fatty acid Metabolism?

3 (a) What are eicosanoids ? Give their physiological roles.

(b) Draw a scheme to show how these physiologically vital compounds are produced in a mammalian system.

(c) What is the biochemical basis of the anti-inflammatory action of the drug aspirin?

4 (a) (i) Draw the structure of cholesterol (ii) Give any five physiological roles of this biologically important molecule.

(b) Give the pathway from acetyl CoA to isopentenyl pyrophosphate (IPP) in the de novo biosynthesis of cholesterol in the liver.

(c) The enzyme HMG CoA reductase is the major regulatory enzyme in the de novo synthesis of cholesterol. Discuss how this is achieved.

5 (a) What are lipoproteins? List the major classes of lipoproteins

(b) Describe the lipid transport functions of lipoproteins

(c) (i) Using the structure of a named glycerophospholipid, show the cleavage sites of the phospholipase A1, phospholipase A2, phospholipase C and phospholipase D

(ii) Which of these phospholipases are you likely to get from the venom of the king cobra?