

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF MEDICINE

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY DEGREE

PART 2 EXAMINATIONS

MBM 2101 : SYNTHESIS OF BIOMOLECULES

DATE : DECEMBER 2006

TIME : 3 HOURS

Instructions to Candidates

Answer all questions

SECTION A

1. Clearly outline the hexose monophosphate shunt, highlight its significance and the associated disorders. (20)
 2. Give a detailed account of cholesterol synthesis and its regulation. (20)
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SECTION B

3. How is glucose formed from the following:
 - (a) galactose (3)
 - (b) fructose (3)
4. How does fructose 2,6 bisphosphate regulate gluconeogenesis? (4)
5. Write short notes on the following
 - (a) von Gierke's disease (3)
 - (b) Pompe's disease. (3)
6. Highlight the differences between glycogen metabolism in red muscle and white muscle. (4)

7. List the major steps in fatty acid synthesis. (3)
8. Give the name and the function of the prosthetic group of the acyl carrier protein (ACP). (3)
9. Diagrammatically illustrate the synthesis of triacylglycerols in adipose tissue. (4)
10. Clearly explain the synthesis of phosphatidyl serine and phosphatidyl choline from phosphatidate. (3)
11. Explain how a specific ganglioside on the intestinal mucosa mediates the action of cholera toxin. (4)
12. Highlight the core lipids, apoproteins and mechanism of delivery of the following.
 - a) intermediate density lipoprotein (IDL) (3)
 - b) high density lipoprotein. (HDL) (3)
13. Show the reactions involved in the synthesis of the following amino acids:
 - a) serine (3)
 - b) glutamine. (3)
14. With the aid of a diagram, show how (deoxythymidylate) dTMP synthesis can be blocked by named drugs. (4)
15. Clearly outline the feedback inhibition sites in purine synthesis. (3)
16. How does allopurinol alleviate gout? (4)

END OF EXAMINATION