KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN FORENSIC SCIENCE

SBC 304: BIOCHEMISTRY OF SPECIAL ORGANS

DATE: Tuesday 3rd April 2012 **TIME: 8.00a.m – 10.00a.m**

INSTRUCTIONS:

SECTION A: *Answer All Questions (1 mark each)*

Answer *true* or *false* the following questions in the answers booklet :

1 Liver has predominantly the GLUT 4 type of glucose transporters.

2 Most of the energy required by the liver is derived from oxidation of amino acids.

3 The major enzyme in saliva is pepsin.

4 Glutamine metabolism in the kidney can lead to gluconeogenesis during starvation.

5 Dietary carotenoids contribute to the color of the skin.

Answer the following questions below:

6 Name two factors involved in inflammation-induced hyperpigmentation.

7 Name two ligands for Toll-like receptors 2 and 4 during inflammation.

8 Name two factors regulating the acid secretion by oxyntic cells in the stomach.

9 List two major substrates for hepatic gluconeogenesis in order of importance.

10 Name the major metabolic response of adipose tissue during acute inflammation.

Fill the gaps:

11 _____white adipose tissue produces a greater effect on systemic inflammation than other sites of WAT accumulation.

12 Butyrate action is on histone _____. _____ of histones facilitates access of DNA repair enzymes.

13 PTH binds to specific receptors on osteoblasts, and stimulating ion and amino acid_____, and _____.

14 If the normal ratio of _____is restored then the acidosis or alkalosis is compensated.

15 Bone _____ occurs in response to physical stress and weight bearing exercise can increase _____ in adolescence.

For each of the following multiple choice, choose the most appropriate answer:

16 The most common cause of chronic kidney disease is

A Diabetes

B Cancer

C Liver failure

D Scurvy

17 Angiotensinogen is a substrate for

A α-globulin

B Angiotensin converting enzyme

C Rennin

D Aldosterone

18 Which of the following microorganisms belong to probiotic species in the colon?

A Bacteriodes

B Lactobacillus

C Clostridium

D Bifidobacterium

19 Which of the following cells are not present in adipose tissue?

A Macrophages

B Epithelial cells

C Fibroblasts

D Keratinocytes

20 Failure to repair dipyrimidine lesions in the skin is the caused by genetic disorder:

A Marfan syndrome

B Hyperkeratosis

C Xeroderma pigmentosum

D Ehlers-Danlos syndrome

SECTION B: *Answer All Questions (5 marks each)*

1 Explain the role of protein metabolites produced by bacterial activity in the colon in health and disease (5 marks)

2 a) Name four hormones involved in the regulation of leptin level (2 marks)

b) State the role of the leptin during adipose tissue inflammation (3 marks)

3 a) Name four functions of norepinephrine in brown adipose tissue (2 marks)

b) Outline the regulation of lipolysis by norepinephrine in brown adipose tissue (3 marks)

4 a) State the role of testosterone and oestrogen in the bone pathology (2 marks)

b) Explain the role of vitamin D in osteomalacia (3 marks)

5 Explain why blondes and red hair individuals are more susceptible to skin cancer (5 marks)

6 a) Outline the formation and excretion of ammonia in kidney (3 marks)

b) State the role of the liver in ammonia metabolism complementary to the above process (a)

(2 marks)

SECTION C: *Answer Any Two Questions (10 marks each)*

1 a) Outline the bilirubin metabolism from hemoglobin in the liver and gastrointestinal tract (6 marks)

b) Explain the clinical significance of the conjugated and unconjugated bilirubin in plasma and urine (3 marks)

c) Write the Fouchet's reaction for bilirubin test in the urine (1 mark)

2 a) Outline the major events of chronic inflammation (6 marks)

b) Explain various ways of resolution of tissue inflammation (4 marks)

3 a) Outline the formation of collagen (6 marks)

b) Write four reactions of post-translational processing for collagen: (4 marks)