

CHUKA



UNIVERSITY

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**EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF SCIENCE IN BIOCHEMISTRY**

BIOC 416: BIOCHEMICAL PATHOLOGY AND TOXICOLOGY

STREAMS: BED (ARTS)

TIME: 2 HOURS

DAY/DATE: MONDAY 03/12/2018

2.30 PM – 4.30 PM

INSTRUCTIONS:

Answer Question One and any other Two Questions

Question 1 (compulsory) 30 marks

- (a) Define neurotoxicity and briefly describe the classification of neurotoxic injuries based on the neuronal structures or function affected. [5 marks]
- (b) Outline 5 main mechanisms that can convert proto-oncogenes to oncogenes. [5 marks]
- (c) Using specific examples, describe classification of cancer based on the three embryonic germ layers from which tissue or organ is derived. [5 marks]
- (d)
 - (i) Explain the biochemical sequence of events leading to profound hypoglycaemia in an apparently healthy subject 36 hours after an alcoholic binge.
 - (ii) How does the alcohol deterrent, Antabuse (disulfiram), work? [5 marks]
- (e) Describe five factors which places an individual at increased risk of anemia. [5 marks]
- (f) State three characteristics of ideal tumor markers. State their roles in the management of cancers. [5 marks]

Question 2 (20 marks)

A 65-year-old man was admitted to the emergency department in an unconscious state. Apparently he had become increasingly depressed after death of his younger son two months

ago. Previously before his death he had been a moderate drinker, but consumption of alcohol had increased markedly over the last few weeks. He had also been eating poorly.

His elder son had dropped around to see him on Sunday morning and found him unconscious in the living room couch with two empty bottles of whisky. Three more bottles were also found on the living room table. On examination he could not be roused, his breathing was deep and noisy.

Alcohol could be smelt in his breath, and his temp was 36 °C

Lab findings:

Blood alcohol 550mg/dl

Blood glucose 50mg/dl

Blood lactate 8 mmol/L

pH 7.21

(a) Give a detailed account on the metabolism of alcohol on this patient. [10 marks]

(b) Describe the biochemical basis for all the laboratory findings in this patient. [10 marks]

Question 3 (20 marks)

(a) Highlight how Proto-oncogenes, Oncogenes and Tumor suppressor genes modulate tumor formations. [10 marks]

(b) Discuss the clinical significance of tumor markers. [10 marks]

Question 4 (20 marks)

(a) Describe four types of Leukemia. [4 marks]

(b) Explain how the extrinsic and intrinsic coagulation pathways lead to the common pathway, and the coagulation factors involved in each. [10 marks]

(c) Describe five types of coagulopathies. [6 marks]
