

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

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

BIOC 424: BIOCHEMICAL ENDOCRINOLOGY

STREAMS: BIOC 424

TIME: 2 HOURS

DAY/DATE: TUESDAY 30/03/2021

2.30 P.M – 4.30 P.M

INSTRUCTIONS:

Answer question one and any other two questions

Do not write on question paper

QUESTION ONE (30 MARKS)

(a) Certain malignant tumors of the pancreas cause excessive production of insulin by the β -cells. Affected individuals exhibit shaking and trembling, weakness and fatigue, sweating and hunger. If this condition is prolonged, brain damage occurs.

(i) What is the effect of hyper insulinism on the metabolism of carbohydrate, amino acids and lipids by the liver? [5 marks]

(ii) What are the causes of the observed symptoms? Suggest why this condition, if prolonged leads to brain damage. [3 marks]

(b) Give an account of structure, mode of action and functions of progesterone. [6 marks]

(c) Using illustrative diagram, describe mechanism of insulin action. [5 marks]

(d) Describe molecular mechanism of thyroid hormone synthesis and secretion. [5 marks]

(e) Explain how human chorionic Somatomammotropin balances mother and fetal energy metabolism during pregnancy. [3 marks]

(f) Give hormonal basis of contraceptives. [3 marks]

QUESTION TWO

(a) What are pituitary ‘Tropins’? Describe the chemistry, regulation of secretion and functions of:

(i) Thyrotropic hormone (TSH) and

(ii) Adrenocorticotropic hormone (ACTH) [10 marks]

(b) Discuss major signaling pathways used by hormones to regulate cellular processes. [10 marks]

QUESTION THREE

(a) Define pheromones. Explain the role of four pheromones in human. [10 marks]

(b) Outline major steroidogenic pathways of dehydroepiandrosterone (DHEA) and testosterone synthesis. [10 marks]

QUESTION FOUR

(a) Discuss the physiological role of Abscisis acid (ABA) in plant response to environmental stress. [10 marks]

(b) List and describe endocrine diseases associated with hormone excess. [10 marks]
