BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – M.Sc.(MLT)-2023
Course Name – Diagnostic Endocrinology & Enzymology
Course Code - MMTD02004A
(Semester II)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Identify the model generally used to describe enzyme kinetics

a) Michaelis-Menten kinetics
b) Hill equation
c) Lineweaver-Burk plot
d) Eadie-Hofstee plot

(ii) Compare between allosteric and active site:

a) The active site is a type of non-competitive inhibitor, while allosteric site is where substrate binds.
b) The active site is where substrate binds, while allosteric site is a regulatory site.
c) Allosteric site is found in all enzymes, while active site is specific to allosteric enzymes.
d) The active site determines the enzyme's specificity, while allosteric site is where cofactors bind.

(iii) Identify In which type of enzyme inhibition does the inhibitor bind to both the enzyme and the enzyme-substrate complex?

a) Competitive inhibition
b) Uncompetitive inhibition
c) Mixed inhibition
d) Noncompetitive inhibition

(iv) Analyze the characteristics of eicosanoids and deduce their classification based on solubility and mechanism of action.

a) Water-soluble; act via second messengers
b) Lipid-soluble; act via intracellular receptors
c) Water-soluble; act via extracellular receptors
d) Lipid-soluble; act via membrane-bound receptors

(v) Compare the effects of stress on the secretion of Corticotropin-releasing hormone (CRH) and Gonadotropin-releasing hormone (GnRH).

a) Both are equally stimulated by stress.
b) CRH secretion increases, while GnRH secretion decreases.
c) CRH secretion decreases, while GnRH secretion increases.
d) Both are inhibited by stress.

(vi) Analyze the feedback loop involving cortisol and identify which hypothalamic hormone's secretion is inhibited by high levels of cortisol.

a) Dopamine
b) Corticotropin-releasing hormone (CRH)
c) Thyrotropin-releasing hormone (TRH)
d) Gonadotropin-releasing hormone (GnRH)

(vii) Analyze the role of melatonin in regulating circadian rhythms and deduce its impact on the secretion of other hormones. Which hormone is most affected by melatonin's influence on circadian rhythms?

a) Growth hormone (GH)
b) Cortisol
c) Thyroxine (T4)
d) Insulin

(viii) Relate the enlargement of the thyroid gland (goiter) to the following disorder:

a) Graves' disease
b) Hashimoto's thyroiditis
c) Addison's disease
d) Cushing's syndrome

(ix) Compare the symptoms of hyperthyroidism and hypothyroidism. Choose the correct statement:

a) Hyperthyroidism presents with weight gain, while hypothyroidism presents with weight loss.
b) Hyperthyroidism presents with heat intolerance, while hypothyroidism presents with heat tolerance.
c) Both hyperthyroidism and hypothyroidism present with fatigue.
d) Both hyperthyroidism and hypothyroidism present with increased heart rate.

(x) Select the correct statement regarding the location of the parathyroid glands:

a) The parathyroid glands are located in the thoracic cavity.
b) The parathyroid glands are situated in the abdominal region.
c) The parathyroid glands are embedded within the thyroid gland.
d) The parathyroid glands are found in the brain.

(xi) Identify the hormone secreted by the parathyroid glands that regulates calcium levels in the blood:

a) Calcitonin
b) Thyroid-stimulating hormone (TSH)
c) Parathyroid hormone (PTH)
d) Aldosterone

(xii) Relate the excessive secretion of parathyroid hormone (PTH) to the following disorder:

a) Osteoporosis
b) Rickets
c) Cushing's syndrome
d) Addison's disease

(xiii) Analyze the impact of parathyroid hormone (PTH) on bone remodeling and calcium homeostasis. Which condition is characterized by excessive bone resorption and elevated serum calcium levels?

a) Osteoporosis
b) Hypercalcemia
c) Hyperparathyroidism
d) Hypocalcemia

(xiv) Select the correct statement regarding the primary function of insulin:

a) Insulin promotes glycogenolysis.
b) Insulin inhibits gluconeogenesis.
c) Insulin stimulates glucagon secretion.
d) Insulin enhances lipolysis.

(xv) Choose the hormone primarily responsible for promoting glucose uptake and storage in liver and muscle cells:

a) Insulin
b) Glucagon
c) Somatostatin
d) Cortisol

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Name two examples each of peptide hormones and non-peptide hormones. (3)
3. Name two hormones produced by the hypothalamus. (3)
4. Name the hormone primarily produced by the pineal gland. (3)
5. Distinguish between primary hyperparathyroidism and secondary hyperparathyroidism in terms of underlying causes and clinical manifestations. (3)
6. Justify the use of creatine kinase (CK) and troponin measurements in diagnosing acute coronary syndromes. (3)

OR

Analyze the clinical utility of measuring cardiac enzymes in diagnosing myocardial infarction. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain the role of secondary messenger systems in hormone action. (5)
8. Explain the role of hypothalamic hormones in regulating pituitary gland function. (5)
9. Create a flowchart illustrating the hypothalamic-pituitary axis and the regulation of hormone secretion. (5)
10. Analyze factors influencing ALT levels in laboratory tests. (5)
11. Write a note on Troponin (5)
12. Categorize hypothalamic hormones based on their functions. (5)

OR

Evaluate the functions of thyroid hormones and their role in the body (5)

****