THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 0524] **MAY 2024** **Sub. Code: 4030**

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

PAPER II - ENZYMES, BIOENERGECTIS, BIOLOGICAL OXIDATION, METABOLISM OF BIOMOLECULES, INTERMEDIARY METABOLISM AND REGULATION, INBORN ERRORS OF METABOLISM AND NUTRITION

Q.P. Code: 204030

Time : Three Hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

1. Explain in detail the mechanisms of regulation of Enzymes in the body.
2. Write the components of Electron transport chain and steps in the generation of ATP by oxidative phosphorylation.

II. Write notes on: **(10 x 5 = 50)**

1. Role of vitamins in Citric acid cycle.
2. Metabolism of HDL.
3. Regulation of lipogenesis.
4. Sphingolipidoses.
5. Homocystinuria.
6. The Antioxidant paradox.
7. Regulators of Appetite.
8. Zinc.
9. D-Dimer.
10. Acute Intermittent Porphyria.

III. Reasoning out: **(4 X 5 = 20)**

1. Vitamin D is a Hormone.
2. Bantu tribes in Africa are prone to Hemosiderosis.
3. Futile cycle allow fine tuning and rapid response.
4. Cellular concentration of pyruvate and α ketoglutarate increases in Beriberi.

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THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 1224] **DECEMBER 2024** **Sub. Code: 4030**
(OCTOBER 2024 EXAM SESSION)

M.D. DEGREE EXAMINATION

BIOCHEMISTRY

PAPER II - ENZYMES, BIOENERGECTIS, BIOLOGICAL OXIDATION, METABOLISM OF BIOMOLECULES, INTERMEDIARY METABOLISM AND REGULATION, INBORN ERRORS OF METABOLISM AND NUTRITION

Q.P. Code: 204030

Time : Three Hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

(10+5)

1. a) List the steps and enzymes which requires B complex vitamins as co enzymes in Citric Acid Cyle.
   b) Discuss the Significance of this pathway.

(4+8+3)

2. a) Brief how the β oxidation of Unsaturated fatty acids differs from saturated fatty acids.
   b) Describe in detail about the enzymes of β oxidation with its energetics.
   c) How will you evaluate disorders associated with defective carnitine cycle.

II. Write short notes on: **(10 x 5 = 50)**

1. Nutrition support for patient with surgery.
2. Decarboxylation reactions.
3. Mechanism of action and non-calcemic functions of Vitamin D.
4. Clinical utility of Isoenzymes.
5. Hyperglycemic Hyperosmolar State.
6. Regulation of intracellular iron homeostasis.
7. Markers of antioxidant status.
8. Metabolic derangement in chronic alcoholism.
9. Synthesis and regulation of D.N.A. nucleotides.
10. Discuss about High energy compounds and its importance.

III. Reasoning out: **(4 X 5 = 20)**

1. Niacin deficiency not affects E.T.C. though N.A.D is the coenzyme for complex I.
2. Redox shuttling is essential for continuation of glycolysis.
3. H.D.L. Concentration is indirectly proportional to Hepatic lipase activity.
4. Noncompetitive inhibition is reversible.

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THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 0525] **MAY 2025** **Sub. Code: 4030**

M.D. DEGREE EXAMINATION

BIOCHEMISTRY

PAPER II - ENZYMES, BIOENERGETICS, BIOLOGICAL OXIDATION, METABOLISM OF BIOMOLECULES, INTERMEDIARY METABOLISM AND REGULATION, INBORN ERRORS OF METABOLISM AND NUTRITION

Q.P. Code: 204030

Time : Three Hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

1. Explain in detail the metabolism of tyrosine and associated inborn errors of the same.
2. Explain in detail the synthesis of heme and associated disorders.

II. Write notes on: **(10 x 5 = 50)**

1. Explain the role of chemiosmotic theory in respiratory control and the inhibitors of the Respiratory chain.
2. High anion gap metabolic acidosis.
3. Explain the various tests to assess the pancreatic functions and its clinical significance.
4. Brown adipose tissue metabolism.
5. Cellular defense against reactive oxygen species.
6. Myocardial reperfusion injury.
7. Total parenteral nutrition.
8. Iron absorption and transport.
9. Pathogenesis of chronic complications of diabetes mellitus.
10. Brief the mechanism to facilitate enzyme catalysis with suitable examples.

III. Reasoning out: **(4 X 5 = 20)**

1. Conjugated bilirubin is water soluble.
2. Dipalmitoyl lecithin required for normal lung function.
3. Alcohol intoxication leads to hypoglycaemia.
4. Glucose stored as glycogen.

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THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[MD 1025] **OCTOBER 2025** **Sub. Code: 4030**

M.D. DEGREE EXAMINATION

BIOCHEMISTRY

PAPER II – ENZYMES, BIOENERGETICS, BIOLOGICAL OXIDATION, METABOLISM OF BIOMOLECULES, INTERMEDIARY METABOLISM AND REGULATION, INBORN ERRORS OF METABOLISM AND NUTRITION

Q.P. Code: 204030

Time : Three Hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

1. Explain in detail the integration of metabolism in various organs in FED state and starvation.

2. a) Explain in detail the significance and steps of Biosynthesis of Palmitic acid. (9)
   b) Add a note on its regulation. Also add a note on microsomal desaturate enzyme system. (3+3)

II. Write notes on: **(10 x 5 = 50)**

1. Receptor mediated endocytosis of LDL.
2. Wilson's disease.
3. Diagnostic significance of liver enzymes.
4. Remnant hyperlipoproteinemia.
5. Cellular defense against reactive oxygen species.
6. Brief the metabolic disorders associated with Tyrosine metabolic pathways.
7. Glycaemic index and its clinical significance.
8. Biochemical role and deficiency diseases of Vit B12.
9. Explain the various transporter systems of the inner mitochondrial membrane and their importance.
10. Acquired hyperbilirubinemia.

III. Reasoning out: **(4 X 5 = 20)**

1. Cyanide poisoning leads to rapid cell death.
2. Fuel sparing effect of fat.
3. Drug induced lysis of RBC'S.
4. Atherogenic nature of LP (a).

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THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[MD 0526] **MAY 2026** **Sub. Code: 4030**

M.D. DEGREE EXAMINATION

BIOCHEMISTRY

PAPER II – ENZYMES, BIOENERGETICS, BIOLOGICAL OXIDATION, METABOLISM OF BIOMOLECULES, INTERMEDIARY METABOLISM AND REGULATION, INBORN ERRORS OF METABOLISM AND NUTRITION

Q.P. Code: 204030

Time : Three Hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 15 = 30)**

1. Classify lipoproteins. Explain the metabolism of High-Density Lipoprotein. Add a note on Fredrickson's classification of Lipoproteinemias.

2. Write in detail the heme synthesis and its regulation Add a note on Acute Porphyrias.

II. Write notes on: **(10 x 5 = 50)**

1. Polyamines synthesis and its functions.
2. Metabolism of cysteine and its functions.
3. Fructose 2, 6 –Bisphosphate role in regulation of glycolysis and gluconeogenesis.
4. Chemiosmotic theory.
5. Mechanistic strategies of enzyme to facilitate catalysis.
6. Role of minerals as prosthetic group of Enzymes.
7. Glycogen storage disorders.
8. Keto diet.
9. Folate trap.
10. Toxic effects of Xenobiotics.

III. Reasoning out: **(4 X 5 = 20)**

1. Brown adipose tissue promotes thermogenesis.
2. Riboflavin plays a central role in energy metabolism.
3. Benzoic acid and Arginine used in the treatment of urea cycle disorders.
4. Pellagra occurs as a secondary manifestation of carcinoid syndrome.

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