

MAGADH UNIVERSITY, BODHGAYA



SYLLABUS
FOR
BIOCHEMISTRY PRT

2011

Syllabus for Pre Ph D Registration Test

Biochemistry

There shall be two papers each of 100 marks. Time allowed for each paper shall be 3 hours.

Paper-I will consist of questions pertaining to general awareness of Biochemistry. In all 25 questions of objective type of multiple choice/true - false/matching /fill up the blank, are to be set out of the prescribed syllabus. Each question will be of 4 marks. All questions are compulsory.

Paper-II will consist of ten descriptive types of questions - four questions from G A of which any two are to be answered and six questions from G B of which any three are to be answered. Each question will be of 20 marks.

Group-A

1. Biophysical chemistry:
 - (i) Electronic theory of valency.
 - (ii) Atomic and molecular structure.
 - (iii) Oxidation and reduction reactions.
 - (iv) Ultracentrifugation and its application.
 - (v) Nature and uses of radioactivity, radioisotopes and autoradiography.
 - (vi) Electrophoresis and its application
2. Cell Biology:
 - (i) Ultrastructure and functions of prokaryotic and eukaryotic cells.
 - (ii) Cell cycle and its regulation.
 - (iii) Cell and tissue differentiation, totipotency.
 - (iv) Apoptosis and carcinogenesis.
 - (v) Structure and properties of genetic material.
3. Metabolism:
 - (i) Laws of thermodynamics and its application in biological reactions.
 - (ii) Molecular structure, classification and properties of carbohydrates, lipids, amino acids, and nucleic acids.

(iii) Biosynthesis of glycogen and hormonal regulation of carbohydrates.

(iv) α , β oxidation of fatty acids.

(v) Urea cycle and its regulation.

Plant Biochemistry & Environmental Biochemistry:

(i) PS I and PSII systems of light reactions.

(ii) Photorespiration and its significance.

(iii) Mechanism and significance of biological nitrogen fixation.

(iv) Concept and structure of environment, environmental toxicants and mechanism of toxicity.

(v) Nature of air pollutants, water pollutants, bio-pollutants and their impact on environment and important control measures.

3. Human Physiology:

(i) Characteristics, classification and functions of mammalian tissues.

(ii) Mechanism of digestion and absorption of carbohydrates, lipids, proteins, minerals and vitamins.

(iii) Cardiovascular and lymphatic system.

(iv) Endocrine glands and their physiological roles. Structure and functions of kidney, active and passive transport of sugars, amino acids, urea and creatinine

(v) Ultra-structure and molecular mechanism of contraction of skeletal muscle and its regulation.

(3)

Group-B

1. Enzymology:
 - (i) Structure, classification and properties of enzymes, mechanism of enzyme action.
 - (ii) Michaelis and Menten kinetics, determination and significance of K_m .
 - (iii) Mechanism of enzyme regulation.
 - (iv) Organization, classification and nature of mammalian hormones, mechanism of hormone action.
 - (v) Regulation of pituitary, thyroid and Pancreatic hormones, disorder of endocrine function.

2. Immunology:
 - (i) Structure and function of cells and tissues involved in immune system, primary and secondary immune responses.
 - (ii) Stem cells, their differentiation and applications.
 - (iii) Structure, nature and function of antigens and antibodies.
 - (iv) Activation and role of B- cells and T-cells in immune responses , MHC restriction and its role in immune responses.
 - (v) Monoclonal antibodies, hybridoma technique, immuno-electrophoresis, Western Blotting, RIA and ELISA techniques.
 - (v) Hypersensitivity, Immune-diseases, acquired immuno deficiency syndrome, vaccines and their role in the prevention of diseases.

(4)

3. Molecular Biology:

- (i) Recombinant DNA technology, restriction endonucleases and their mode of action.
- (ii) Construction of genomic and c DNA, chemical synthesis of gene, cloning vectors.
- (iii) DNA sequencing, Human Genome Project.
- (iv) Monoclonal antibodies and cell fusion, protoplast fusion, application of monoclonal antibodies.
- (v) Micropropagation, somatic hybridization, various methods of gene transfer.
- (vi) PCR, DNA Finger Printing, RFLP and applications.

4. Biostatistics &

Biinformatics :

- (i) Frequency distribution of biological data – mean, median, mode.
- (ii) Measurement of variation – co-efficient of variation, standard deviation, standard error.
- (iii) Correlation coefficient (r) and its application.
- (iv) Comparison of data by t-test, F – test.
- (v) Chi square test and its significance.
- (vi) Structure and components of a computer and their usage, application of software packages – M S Word, M S Excel, M S Power Point, application of Internet.

5. Clinical Biochemistry :

- (i) Disorders of carbohydrates metabolism- diabetes, hypoglycemia, galactosemia
- (ii) HDL and LDL cholesterol and tri - glycerides disorders.
- (iii) Disorders of amino acid metabolism.
- (iv) Disorders of Nucleic acid metabolism.
- (v) Inborn errors of metabolism- alcaptonuria, phenylketoneuria, albinism.

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10.10.11

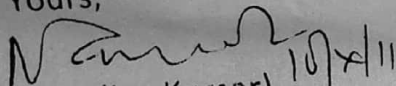
To
The Controller of examinations
Magadh University, Bodhgaya

Subject: Syllabus for PRT in Biochemistry.

Sir,

I am hereby enclosing the the syllabus of Pre Ph D Registration Test in
Biochemistry for the needful.

Yours,


(Nandjee Kumar) 10/10/11

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