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MD Biochemistry
EXAMINATION Supple, Nov 2016

Paper First

CELL & MOLECULAR BIOLOGY, IMMUNOLOGY, CANCER

*Time: Three Hours]**[Maximum Marks: 100***Note: Attempt all questions. All parts are compulsory.**

1. Discuss in detail the steps of monoclonal antibody production from a given protein and their applications. [10]
2. Write briefly on the following : [5x6]
 - a. Bare lymphocyte syndrome
 - b. Polyclonal antibodies
 - c. Mitochondrial diseases
 - d. Yeast as a research tool
 - e. Tumor suppressor genes
 - f. Gene dosage effect
3. Explain why : [5x5]
 - a. Why replacing one nucleotide by another , leads to a difference in the rate of electrophoretic migration in SSCP ?
 - b. Why is calcium and heat shock used for transforming bacteria with plasmids?
 - c. How does diphtheria toxin act on eukaryotic cells?
 - d. How does the same gene code for both apo B-100 and apo B-48 ?
 - e. How does a far fewer numbers of t- RNA species bind to a large number of genetic codes ?
4. Compare & contrast [5x4]
 - a. Idiotypic isotype and allotype of antibodies.
 - b. Primary and secondary lymphoid organs.
 - c. Mechanism of action of 5- Fluorouracil & Methotrexate with mechanism of action of Bleomycin.
 - d. Mechanism of action of Cyclophosphamide & Cisplatin with mechanism of action of Paclitaxel & Vincristine.
5. Give a brief account of : [5x3]
 - a. Pathogenesis of Autoimmunity
 - b. Telomerase
 - c. Oncogenes

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MD Biochemistry
EXAMINATION Supple, Nov 2016

Paper Second

**BIOENERGETICS, GENERAL BIOCHEMISTRY, METABOLISM, NUTRITION,
VITAMINS AND HORMONES.**

Time: Three Hours]

[Maximum Marks: 100

Note: Attempt all questions.

1. Discuss about inborn errors of amino acid metabolism. [10]
2. Write short notes on - [5x4]
 - a. Polycystic Ovarian Syndrome
 - b. Homocysteine
 - c. Metabolic acidosis.
 - d. Hypervitaminosis
3. Discuss - [5x6]
 - a. Fast food & energy status of the body.
 - b. Metabolic syndrome & its evaluation
 - c. Cyanide poisoning
 - d. Heat labile vitamins
 - e. Microalbuminuria
 - f. Treatment of iron deficiency anemia
4. Explain in detail- [5x3]
 - a. Hydroxylation of xenobiotics is not always beneficial.
 - b. Intake of oral contraceptive pill prevents pregnancy without disturbing menstrual cycle.
 - c. As a management of hyperkalemia intravenous mixture of glucose & insulin is administered in a slow drip.
5. Give a brief account of- [5x5]
 - a. Non- alcoholic fatty liver disease
 - b. Biological roles of Zinc & copper.
 - c. Effect of digitalis on sluggish cardiac muscle
 - d. Brown adipose tissue & other adipose tissues.
 - e. Role of alpha ketoglutarate in collagen synthesis

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MD Biochemistry
EXAMINATION Supple, Nov 2016

Paper Third

ENZYMOLOGY, CLINICAL BIOCHEMISTRY AND BIostatISTICS

Time: Three Hours]

[Maximum Marks: 100

Note: Attempt all questions. All parts are compulsory.

1. Describe principle, types, methods & application of electrophoresis in clinical biochemistry laboratory. [10]
2. Write briefly on the following: [5x4]
 - a. Allosteric regulation of enzymes.
 - b. Activation energy in enzymes
 - c. Michaelis-Menten Equation
 - d. Ribozymes
3. Discuss the following: [5x6]
 - a. Water quality in a clinical laboratory.
 - b. Markers of Myocardial infarction
 - c. Dry chemistry vs wet chemistry analysis.
 - d. HbA_{1c} vs glycated albumin
 - e. Role of western Blotting in diagnostics.
 - f. Chi Square Test
4. Explain in detail: [5x3]
 - a. Elaborate the technique for collection & analysis of urine.
 - b. Maternal diabetes leads to large for date baby.
 - c. Lp(a) in atherosclerosis
5. Give a brief account of: [5x5]
 - a. Role of diet in result of laboratory investigations.
 - b. Internal quality control in Biochemistry laboratory.
 - c. Significance of Levy- Jennings chart in clinical laboratory.
 - d. Ames test
 - e. Student 't' test.

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MD Biochemistry
EXAMINATION Supple, Nov 2016

Paper Fourth

**TECHNIQUES IN EXPERIMENTAL BIOCHEMISTRY, METABOLIC MEDICINE,
RECENT ADVANCES IN BIOCHEMISTRY AND MOLECULAR BIOLOGY.**

Time: Three Hours]

[Maximum Marks: 100

Note: Attempt all questions. All parts are compulsory

1. Describe the principle, technique and applications of Polymerase chain reaction. [10]
2. Write briefly on the following. [5x4]
 - a. Radial Immunodiffusion
 - b. Proteomics
 - c. Osteoporosis
 - d. Alkaptonuria
3. Discuss : [5x6]
 - a. Explain the principle of vitamin D estimation in our immunology laboratory.
 - b. Newborn screening.
 - c. Fractional Centrifugation.
 - d. DNA fingerprinting
 - e. Nanotechnology in modern medicine
 - f. Centrifugation
4. Explain why: [5x3]
 - a. DNA is denatured before blotting on to membrane during southern blotting
 - b. Ethidium bromide is used in the agarose gel electrophoresis of DNA.
 - c. The selection of buffer is important for electrophoresis.
5. Give a brief account of- [5x5]
 - i) SDS PAGE
 - ii) Sandwich ELISA
 - iii) Cell culture
 - iv) Spectrophotometry
 - v) High performance liquid chromatography

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MD Biochemistry
EXAMINATION, June 2016

Paper First

CELL & MOLECULAR BIOLOGY, IMMUNOLOGY, CANCER

Time: Three Hours]

[Maximum Marks: 100

Note: Attempt all questions. All parts are compulsory.

1. Discuss the factors that can lead to DNA damage. Discuss the steps of DNA repair, with an example of its failure. [10]
2. Write briefly on the following. [5x6]
 - a. Yeast as a research tool
 - b. Tumor suppressor genes
 - c. Gene dosage effect
 - d. Bare lymphocyte syndrome
 - e. Monoclonal antibodies
 - f. Mitochondrial diseases
3. Explain : [5x5]
 - a. How does diphtheria toxin act on eukaryotic cells
 - b. How does the same gene code for both apo B-100 & apo B-48
 - c. How does a far fewer numbers of t-RNA species bind to a large number of genetic codes .
 - d. Why replacing one nucleotide by another, leads to a difference in the rate of electrophoretic migration in SSCP ?
 - e. Why is calcium and heat shock used for transforming bacteria with plasmids ? .
4. Compare & contrast [5x4]
 - a. c DNA library & DNA library
 - b. Mechanism of action of cyclophosphamide & cisplatin with mechanism of action of paclitaxel & vincristine.
 - c. Type I & Type III hypersensitivity
 - d. Monoclonal & polyclonal antibodies
5. Give a brief account of : [5x3]
 - a. Primary & secondary lymphoid organs
 - b. Ames test
 - c. Pathogenesis of Autoimmunity

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**MD Biochemistry
EXAMINATION, June 2016**

Paper Second

**BIOENERGETICS, GENERAL BIOCHEMISTRY, METABOLISM, NUTRITION,
VITAMINS AND HORMONES.**

Time: Three Hours]

[Maximum Marks: 100

Note: Attempt all questions.

1. Explain [5×3]
 - a. High energy phosphates act as energy currency of the cell.
 - b. Inability of insulin to act causes ketogenesis.
 - c. Uncouplers of oxidative phosphorylation can generate extra heat
2. Write short notes on - [5×4]
 - a. Antidiuretic hormone
 - b. Vitamin D.
 - c. Polyamines.
 - d. Organic aciduria
3. Discuss - [5×6]
 - a. Biochemical basis of metabolic syndrome & its medical evaluation.
 - b. Structure, synthesis & clinical importance of collagen protein.
 - c. Sources & dietary requirement of iron. Describe the processes of absorption, transport & storage of iron in our body.
 - d. Heat labile vitamins
 - e. Microalbuminuria
 - f. Nutritional requirement in the elderly
4. Write in detail about Maple syrup urine disease. [10]
5. Enumerate differences between: [5×5]
 - a. Anemia due to iron deficiency compared to B₁₂ deficiency
 - b. Alcoholic fatty liver disease & Non-alcoholic fatty liver disease.
 - c. Vit C & Vit E
 - d. Brown adipose tissue & other adipose tissues.
 - e. Peptide hormones & steroid hormones

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MD Biochemistry
EXAMINATION, June 2016

Paper Third

ENZYMOLGY, CLINICAL BIOCHEMISTRY AND BIOSTATISTICS

Time: Three Hours]

[Maximum Marks: 100

Note: Attempt all questions. All parts are compulsory.

1. Describe in detail with appropriate examples, the significance of enzymes in the clinical laboratory, research & diagnostic. [10]
2. Write briefly on the following: [5x4]
 - a. Cystatin C
 - b. Nanotechnology in laboratory diagnosis
 - c. ANOVA
 - d. Point of care testing
3. Discuss the following: [5x6]
 - a. Anion gap & its applied importance
 - b. Levey Jennings chart
 - c. Therapeutic enzymes.
 - d. Reagent grade water preparations
 - e. Glycogenosis
 - f. Serine proteases.
4. Explain in detail: [5x3]
 - a. Methods of identification of isoforms of an enzyme.
 - b. Maternal diabetes leads to large for date baby.
 - c. Total quality management
5. Give a brief account of: [5x5]
 - a. Hexokinase vs Glucose oxidase method in glucose estimation
 - b. Competitive & Non competitive inhibitors.
 - c. Metalloenzymes & metal activated enzymes
 - d. Internal & external quality control
 - e. Colorimeter & spectrophotometer.

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**MD Biochemistry
EXAMINATION, June 2016**

Paper Fourth

**TECHNIQUES IN EXPERIMENTAL BIOCHEMISTRY, METABOLIC MEDICINE,
RECENT ADVANCES IN BIOCHEMISTRY AND MOLECULAR BIOLOGY.**

Time: Three Hours]

[Maximum Marks: 100

Note: Attempt all questions. All parts are compulsory

1. Describe the principle, technique & applications of DNA fingerprinting ? [10]
2. Write briefly on the following. [5x4]
 - a. Radial Immunodiffusion
 - b. Proteomics
 - c. Osteoporosis
 - d. Total parenteral nutrition.
3. Discuss : [5x6]
 - a. Explain the principle of vitamin D estimation in our immunology laboratory.
 - b. Newborn screening.
 - c. Metabolic syndrome & its diagnosis.
 - d. DNA vaccine.
 - e. Nanotechnology in modern medicine
 - f. Diabetic Neuropathy
4. Explain why: [5x3]
 - a. DNA is denatured before blotting on to membrane during southern blotting
 - b. Ethidium bromide is used in the agarose gel electrophoresis of DNA.
 - c. Selection of cuvette is important for spectrophotometry.
5. Enumerate differences between: [5x5]
 - i) SDS PAGE & native PAGE
 - ii) Gel filtration & Affinity chromatography
 - iii) Direct & Sandwich ELISA
 - iv) PCR & PCR- SSCP
 - v) Direct & Indirect Coombs test