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## MANIPAL UNIVERSITY

MD (BIOCHEMISTRY) DEGREE EXAMINATION – APRIL 2016

SUBJECT: PAPER I: GENERAL BIOCHEMISTRY & INSTRUMENTATION

Monday, April 18, 2016

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essays:**

1. Describe the principle and applications of electrophoresis and Immunofixation electrophoresis. Mention two differences between Western Blots and Immunofixation electrophoresis.

(12+3 = 15 marks)

2. Describe the structural organization of proteins, with the help of suitable diagrams. With the help of any four disease examples, explain how abnormalities in structure can affect functioning in a protein and produce disease.

(7+8 = 15 marks)

3. **Write short notes on:**

3A. Structures and functions of heteropolysaccharides

3B. Principles and applications of PCR and RT-PCR

3C. DNA sequencing

3D. Cell cycle

3E. Monoclonal Antibodies

3F. Body buffer systems in health and disease

3G. Cell fractionation

3H. High energy compounds

3I. Affinity chromatography

3J. Endoplasmic reticulum

(7 marks × 10 = 70 marks)



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# MANIPAL UNIVERSITY

## MD (BIOCHEMISTRY) DEGREE EXAMINATION – APRIL 2016

### SUBJECT: PAPER II: METABOLISM AND NUTRITION

Tuesday, April 19, 2016

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

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✍ **Answer ALL the questions.**

✍ **Long Essays:**

1. Describe the HMP shunt pathway. How is it related to Glycolysis? How is HMP regulated in erythrocytes?

(15 marks)

2. Discuss the pathway of heme biosynthesis and its regulation.

(15 marks)

3. **Write short notes on:**

3A. Beta oxidation of odd chain and branched chain fatty acids

3B. Hyperammonemia

3C. Important products synthesized from sulfur containing amino acids

3D. Hormonal regulation of blood sugar in fed state

3E. Formation and fate of acetyl CoA in the body

3F. Inter-relationship of folic acid and vitamin B12 in metabolism

3G. Ocular functions and disorders associated with vitamin A

3H. Diet modifications in Chronic kidney disease

3I. Nutritional anemias

3J. List and discuss in detail any two trace elements

(7 marks × 10 = 70 marks)



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**MANIPAL UNIVERSITY**

**MD (BIOCHEMISTRY) DEGREE EXAMINATION – APRIL 2016**

**SUBJECT: PAPER III: CLINICAL BIOCHEMISTRY**

Wednesday, April 20, 2016

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essays:**

1. Explain the biochemical basis and diagnosis of diabetes mellitus.

(15 marks)

2. Explain the regulation of acid base balance.

(15 marks)

3. **Write briefly on:**

3A. Thalassemia

3B. Carcinoid syndrome

3C. D-dimer

3D. Classification of hormones

3E. Atherosclerosis

3F. Mechanisms of detoxification of xenobiotics

3G. Abnormal copper metabolism

3H. Creatinine clearance

3I. Galactosemia

3J. Diagnosis of jaundice

(7 marks × 10 = 70 marks)



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## MANIPAL UNIVERSITY

### MD (BIOCHEMISTRY) DEGREE EXAMINATION – APRIL 2016

#### SUBJECT: PAPER IV: MOLECULAR BIOLOGY, BIOTECHNOLOGY & RECENT ADVANCES IN CLINICAL BIOCHEMISTRY

Thursday, April 21, 2016

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essays:**

1. Describe the synthesis of different forms of RNA from DNA. Add a note on their inhibitors.  
(15 marks)
2. Elaborate on the use of quality control (QC) material in clinical laboratory. Add a note on QC trouble shooting.  
(15 marks)

3. **Write briefly on:**

- 3A. Mutations
- 3B. Diagnostic use of nucleic acids
- 3C. Linearity check for any given analyte
- 3D. Telomere and telomerase
- 3E. Hybridoma technique
- 3F. DNA polymerase
- 3G. Foetal lung maturity testing
- 3H. Cytotoxic drugs
- 3I. Gene library
- 3J. Post-translational modifications

(7 marks × 10 = 70 marks)

