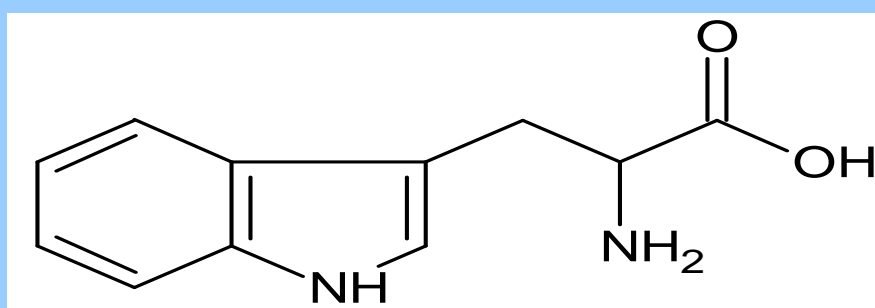
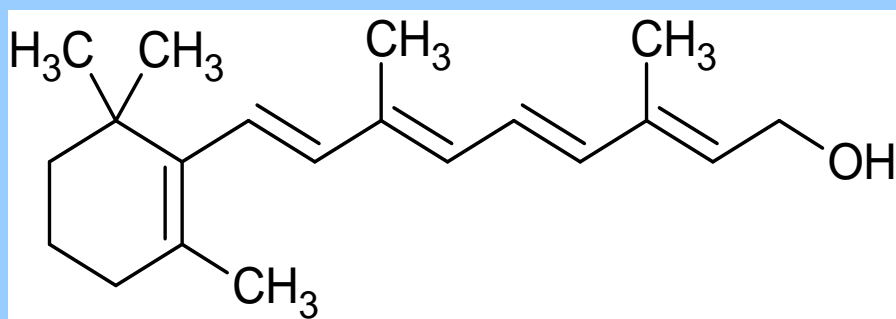


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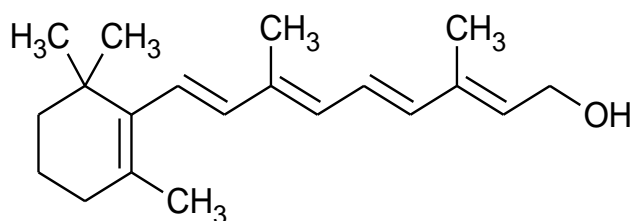
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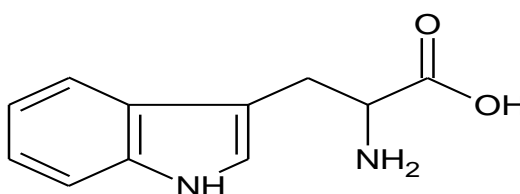
Victor J. Temple

# BIOCHEMISTRY REVISION

## QUESTIONS AND ANSWERS APPROACH



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## PREFACE

The main objective of this book is to provide a simple comprehensive revision of major biochemical concepts that enable students to appreciate the relevance of biochemistry to medicine as well as to everyday life. The book is based primarily on the Biochemistry courses taught to undergraduate (medical, dentistry and health sciences) students in the School of Medicine and Health Sciences (SMHS), University of Papua New Guinea (UPNG). The MBBS program uses the problem-based integrated curriculum in which Biochemistry is taught throughout the duration of the program. The Health Sciences and Dentistry programs use the didactic curriculum in which Biochemistry is taught in the first and second years of each program.

The questions and answers approach adopted in this book should enable students discern core information from that which is peripheral. The book is designed to give students rapid, easy access to the core factual material in a format which facilitates learning and rapid revision. It is hoped that this book will serve as the final preparatory step for the examination in biochemistry. This book should not be used as a replacement for standard biochemistry text book, nor should it prevent the student from attending routine lectures (seminars) or thoroughly revising the various biochemistry topics completed during the semester or trimester. The best way to use this book is for the student to first answer each question before proceeding to the answer section to read the prepared answer.

This book contains special topics in biochemistry (Clinical Biochemistry) with questions and answers that are more relevant to the MBBS problem-based integrated curriculum. Candidates doing the Master of Medicine (M. Med) Part-1 Common Core program in the SMHS UPNG should find this book useful.

The answers provided in this book were obtained from very reliable sources; they were checked and found to be correct and acceptable at the time of publication. However, the possibility of inadvertent errors cannot be totally ruled out; therefore, students are requested to double check the facts presented with other standard texts in biochemistry. A list of references and materials for further reading has been included in the reference section of this book. Constructive comments and recommendations for improvement in the next edition of this book are most welcome by the author.

Victor J. Temple

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## ABBREVIATIONS

ACAT: Acyl-CoA Cholesterol Acyl-Transferase  
ACE: Angiotensin Converting Enzyme  
AEE: Activity-related Energy Expenditure  
Ach: Acetylcholine  
ACP: Acyl Carrier Protein  
ACTH: Adrenocorticotrophic Hormone  
ADP: Adenosine Diphosphate  
AIDS: Acquired Immune Deficiency Syndrome  
ALA: Amino-Laevulinic Acid  
ALP: Alkaline Phosphatase  
ALT: Alanine Transaminase  
AMP: Adenosine Monophosphate  
APR: Acute Phase Reactants  
Aspartate Transaminase  
ATP: Adenosine Triphosphate  
ATPase: Adenosine Triphosphatase  
AVP: Arginine Vasopressin  
BBB: Blood Brain Barrier  
BCB: Blood-Cerebrospinal fluid Barrier  
BMI: Body Mass Index  
2,3-BPG: 2,3-Bis-Phosphoglycerate  
BUN: Blood Urea Nitrogen  
CAH: Congenital Adrenal Hyperplasia  
CoA: Coenzyme A  
C-AMP: 3',5'cyclic AMP  
CC: Creatinine Clearance  
CDP: Cytidine Diphosphate  
C-GMP: cyclic-GMP  
CK: Creatine Kinase  
COMT: Catechol-O-Methyl-Transferase  
Cw: Cytochrome Q (Ubiquinone)  
CRH: Corticotrophin Releasing Hormone  
COX: Cyclooxygenase  
DEE: Daily Energy Expenditure  
DKA: Diabetic Ketoacidosis  
DNA: Deoxyribonucleic Acid  
ECF: Extracellular Fluid  
EPI: Extrinsic Pathway Inhibitor  
EPO: Erythropoietin  
ER: Endoplasmic Reticulum  
ETC: Electron Transport Chain  
FAD: Flavin Adenine Dinucleotide (oxidized)  
FADH<sub>2</sub>: Flavin Adenine Dinucleotide (reduced)  
FBG: Fasting Blood Glucose  
FMN: Flavin Mononucleotide (oxidized)  
FSH: Follicle Stimulating Hormone  
GAG: Glycosaminoglycans

GABA: Gamma Amino Butyric Acid  
GDM: Gestational Diabetes Mellitus  
GFR: Glomerular Filtration Rate  
GGTP: Gamma Glutamyl Transpeptidase  
GMP: Guanosine Monophosphate  
G-6-PD: Glucose-6-Phosphate Dehydrogenase  
GSH: Glutathione (Reduced)  
GSSG: Glutathione (Oxidized)  
GTP: Guanosine Triphosphate  
Hb: Hemoglobin  
HbO<sub>2</sub>: Oxy-hemoglobin  
HDL: High Density Lipoprotein  
HGPRT: Hypoxanthine-Guanine Phospho-Ribosyl-Transferase  
HHb: Reduced Hemoglobin (Deoxy-Hemoglobin)  
HIV: Human Immunodeficiency Virus  
HMG-CoA: 3-Hydroxy-3-Methyl-Glutaryl-CoA  
HMM: Heavy Meromyosin  
HMP-shunt: Hexose Monophosphate Shunt (pathway)  
HVA: Homovanillic Acid  
ICF: Intracellular Fluid  
ID: Iodine Deficiency  
IDD: Iodine Deficiency Disorders  
IDL: Intermediate Density Lipoprotein  
Ig: Immunoglobulin  
IP<sub>3</sub>: Inositol 1,4,5-triphosphate  
LACI: Lipoprotein-Associated Coagulation Inhibitor  
LCAT: Lecithin-Cholesterol Acyl-Transferase  
LDH: Lactate Dehydrogenase  
LFT: Liver Function Tests  
LH: Luteinizing Hormone  
LMM: Light Meromyosin  
MAU: Microalbuminuria  
MNP: Micronutrient Powder  
MSH: Melanocyte Stimulating Hormone  
MAO: Monoamine Oxidase  
NAD: Nicotinamide Adenine Dinucleotide (oxidized)  
NADH: Nicotinamide Adenine Dinucleotide (reduced)  
NADP: Nicotinamide Adenine Dinucleotide Phosphate (oxidized)  
NADPH: Nicotinamide Adenine Dinucleotide Phosphate (reduced)  
NMDA: N-Methyl-D-Aspartate  
OG: Osmolal Gap  
OGTT: Oral Glucose Tolerance Test  
PCOS: Polycystic Ovarian Syndrome  
PLA<sub>2</sub>: Phospho-Lipase A<sub>2</sub>  
PLWHA: People Living with HIV/AIDS  
POMC: Proopiomelanocortin  
PPi: Inorganic Pyrophosphate  
PTH: Parathyroid Hormone  
RBG: Random Blood Glucose  
REE: Resting Energy Expenditure

RER: Rough Endoplasmic Reticulum  
RFLP: Restriction Fragment Length Polymorphism  
RNA: Ribonucleic Acid  
RPF: Renal Plasma Flow  
RTA: Renal Tubular Acidosis  
RUF: Ready-to-Use Foods  
RUTF: Ready-to-Use Therapeutic Foods  
SAC: Surface Active Compounds  
SER: Smooth Endoplasmic Reticulum  
SHBG: Sex Hormone Binding Globulin  
STKM: Sucrose, Tris-buffer, K (potassium), Magnesium  
TAFI: Thrombin-Activatable Fibrinolytic Inhibitor  
TBG: Thyroid Binding Globulin  
TEE: Total Energy Expenditure  
TFPI: Tissue Factor Pathway Inhibitor  
TPP: Thiamine Pyrophosphate  
TSH: Thyroid Stimulating Hormone  
UDP: Uridine Diphosphate  
UDP-GT: UDP-Glucuronyl Transferase  
USI: Universal Salt Iodization  
UTP: Uridine Triphosphate  
VLDL: Very Low Density Lipoprotein  
VMA: Vanillylmandelic Acid

# **BIOCHEMISTRY REVISION**

**QUESTIONS AND ANSWERS APPROACH**

**VICTOR J. TEMPLE**