

CONTENTS

UNIT 1: HEART LUNG MACHINE AND ARTIFICIAL HEART .. 1.1 - 1.44

1.1. Condition to be satisfied by the H/L System.....	1.1
1.1.1. Heart Lung Machine	1.4
1.1.2. Condition to be satisfied by the H/L System	1.6
1.2. Different types of Oxygenators.....	1.7
1.2.1. Usage of Oxygenator	1.8
1.2.2. Blood oxygenator	1.8
1.2.3. Types of Blood Oxygenator	1.9
1.3. Pumps, Pulsatile and Continuous Types	1.15
1.4. Monitoring Process.....	1.20
1.5. Shunting.....	1.23
1.6. The Indication for Cardiac Transplant	1.27
1.7. Blood Handling System	1.28
1.8. Functioning and different types of Artificial Heart.....	1.31
1.8.1. Types of Artificial Heart	1.32
1.9. Schematic for temporary bypass of left ventricle.....	1.36
Two Marks Questions and Answers (Part - A)	1.39
Review Questions (Part B and Part C)	1.44

UNIT 2: CARDIAC ASSIST DEVICES..... 2.1 – 2.29

2.1. Assisted through Respiration	2.1
2.1.1. Ventricular Assist Device (VAD).....	2.1
2.2. Right and left Ventricular Bypass Pumps	2.5

2.2.1. Right Ventricular Bypass Pump	2.6
2.2.2. Left Ventricular Bypass Pump	2.7
2.3. Auxiliary ventricle.....	2.10
2.4. Open Chest and Closed Chest type	2.12
2.5. Intra Aortic Balloon Pumping	2.12
2.6. Prosthetic Cardiac valves.....	2.15
2.6.1. Mechanical Heart Valves	2.16
2.6.2. Biological Heart valves.....	2.22
2.7. Principle of External Counter pulsation techniques	2.24
Two Marks Questions And Answers (Part - A)	2.26
Review Questions (Part B and Part C)	2.29

UNIT 3: ARTIFICIAL KIDNEY..... 3.1 – 3.32

3.1. Introduction.....	3.1
3.1.1. Physiology of Kidney	3.1
3.2. Indication and Principle of Haemodialysis.....	3.3
3.2.1. Principle of Haemodialysis	3.4
3.2.2. Principles of Dialysis with an Artificial Kidney	3.6
3.2.3. Functions of Artificial Kidney	3.8
3.3. Indication of Haemodialysis	3.9
3.4. Membranes for Haemodialysis	3.15
3.5. Dialysate	3.16
3.6. Types of Filter and Membranes	3.17
3.7. Different types of Haemodialysers	3.19
3.8. Monitoring Systems	3.22
3.8.1. Monitoring System of Haemodialysers	3.22

3.9. Wearable Artificial Kidney.....	3.24
3.9.1. Working of WAK	3.25
3.10. Implantable Artificial kidney	3.27
3.11. Implantable Artificial Kidneys (IAK)	3.28
Two Marks Questions and Answers (Part - A)	3.30
Review Questions (Part B and Part C)	3.32

UNIT 4: RESPIRATORY AND HEARING AIDS.....4.1 – 4.48

4.1. Ventilator and its types	4.1
4.1.1. Negative Pressure Ventilators	4.3
4.1.2. Positive-Pressure Ventilators	4.4
4.2. Ventilation Modes.....	4.11
4.3. Breathing Apparatus Operating Sequence	4.16
4.4. Intermittent Positive Pressure	4.18
4.5. Electronic IPPB Unit with monitoring for all Respiratory Parameters.....	4.22
4.6. Deafness.....	4.25
4.7. Hearing Aids	4.28
4.8. SISI (Short Increment Sensitivity Index)	4.33
4.9. Masking Techniques	4.35
4.10. Wearable Devices for Hearing Correction	4.42
Two Marks Questions and Answers (Part - A)	4.45
Review Questions (Part B and Part C)	4.48

UNIT 5: RECENT TRENDS5.1 – 5.39

5.1. Transcutaneous electrical nerve stimulator (TENS).....	5.1
--	------------

5.1.1.	TENS Used to Treat.....	5.2
5.1.2.	TENS Techniques (Types of TENS).....	5.15
5.2.	BIO FEED BACK	5.17
5.2.1.	Procedure for Bio feedback	5.19
5.2.2.	Bio Feedback Instrumentation	5.20
5.3.	Diagnostic and Point of care Platforms.....	5.26
5.3.1.	Diagnostic and Point-Of-Care Platforms (POC)	5.26
5.3.2.	Prevailing status of POC tools in the Indian healthcare system	5.28
5.3.3.	The Utility of POC diagnostic devices in India.....	5.31
Two Marks Questions and Answers (Part - A).....		5.36
Review Questions (Part B and Part C).....		5.39
Model Question Papers		M.Q.1 – M.Q.3