[LD 0212] **AUGUST 2013** **Sub. Code:1422**

B.Sc., CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER II – CARDIO PULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time : Three hours **Maximum : 100 Marks**

Answer all questions

I. Elaborate on **3 x 10 = 30**

1. Hemodynamic aspects of Cardio Pulmonary Bypass
2. Cardiac Cycle
3. Cardioplegia

II. Write Notes on **8 x 5 = 40**

1. Coronary Perfusion
2. Oxygen Toxicity
3. Biocompatible materials
4. Nervous Control of Heart
5. Priming solution
6. Pre Cardio Pulmonary Bypass check list
7. Cerebral protection during Cardio Pulmonary Bypass
8. Anticoagulation

III. Short Answers on **10 X 3 = 30**

1. Extra corporeal membrane oxygen
2. Intra Aortic Balloon Pump
3. Circuit alarms
4. Hematocrit
5. Auto transfusion
6. Roller pumps
7. Electrolyte imbalance
8. Venting of the heart
9. Priming volume
10. Gas transfer

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[LE 0212] FEBRUARY 2014 Sub. Code: 1422

B.Sc., CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER II – CARDIO PULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on **3 x 10 = 30**

1. Cardio Pulmonary Bypass circuit diagram incorporating all components
2. Induced Cardiac Arrest
3. Hypothermia

II. Write Notes on **8 x 5 = 40**

1. Hematocrit
2. Coagulation Cascade
3. Intra aortic balloon pump
4. LV assist devices
5. Partial cardiopulmonary bypass
6. Autotranfusion
7. Modified cold prime cardioplegia
8. Heparin reversal

III. Short Answers on **10 X 3 = 30**

1. Priming volume
2. Rotatory pumps
3. Tubings in CPB
4. Cell saver
5. Protamine
6. IABP
7. Left ventricular Assist devices
8. Hemostasis
9. Biomedicus pump
10. Oxygen Toxicity

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[LF 0212] **AUGUST 2014** **Sub. Code:1422**

B.Sc., CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER II – CARDIO PULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time : Three hours **Maximum : 100 Marks**

Answer all questions

I. Elaborate on: **(3x10=30)**

1. Induced Cardiac arrest
2. Temperature management in Cardio Pulmonary Bypass
3. Complications of extracorporeal circulation

II. Write Notes on: **(8x5=40)**

1. Anticoagulation for Cardio Pulmonary Bypass
2. Blood surface interface
3. Biocompatible materials
4. Acid base balance
5. Coagulation cascade
6. Priming solution
7. Pre Cardio Pulmonary Bypass check list
8. Cerebral protection during Cardio Pulmonary Bypass

III. Short Answers on: **(10x3=30)**

1. Circuit alarms
2. Hematocrit
3. Cell saver
4. Perfusion record
5. Extra corporeal membrane oxygen
6. Roller pumps
7. Filters and Bubble traps
8. Venting of the heart
9. Priming volume
10. Heparin

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[LH 0815] **AUGUST 2015** **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Complications of Cardio Pulmonary Bypass.
2. Starting the pump and going on Bypass.
3. Coming out from the Bypass.

II. Write notes on: **(8 x 5 = 40)**

1. Heparinisation.
2. Heparin reversal.
3. Myocardial protection.
4. Methods of Cardioplegia administration.
5. Canulation of the heart.
6. Supporting the heart on pump (after coming out of Bypass).
7. Hypothermia.
8. Activated clotting time.

III. Short answers on: **(10 x 3 = 30)**

1. Low cardiac output.
2. Low urine output.
3. Blood Transfusion.
4. Hyperkalemia.
5. Ventricular Assist Devices.
6. Types of pumps.
7. Oxygen dissociation curve.
8. Venous drainage of the heart.
9. Cardiotomy suckers.
10. O_2 blender.

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[LI 0216] FEBRUARY 2016 **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Adequacy of Perfusion during Cardio Pulmonary Bypass.
2. Acid Base management on Cardio Pulmonary Bypass.
3. Hematocrit management on Bypass.

II. Write notes on: **(8 x 5 = 40)**

1. Monitoring during Cardio Pulmonary Bypass.
2. Effects of perfusion lungs and blood.
3. Renal complications in cardiac surgery.
4. Prolonged pump time.
5. Cerebral protection.
6. Pacing while weaning from Bypass.
7. Partial Cardio Pulmonary Bypass.
8. Myocardial protection during Cardio Pulmonary Bypass.

III. Short answers on: **(10 x 3 = 30)**

1. Cardiac cycle.
2. Oxygen toxicity.
3. Preload
4. After load.
5. Inotropes.
6. Anticoagulants.
7. Ventricular arrhythmia and management.
8. Deep hypothermic cardiac arrest of the heart.
9. Haematuria after Bypass.
10. Protamine reversal.

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[LJ 0816] AUGUST 2016 **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Cardio Pulmonary Bypass circuit diagram incorporating all components.
2. Cardiac Cycle.
3. Complications of extracorporeal circulation.

II. Write notes on: **(8 x 5 = 40)**

1. Hematocrit.
2. Coronary Perfusion.
3. Heparin reversal.
4. Hyperkalemia.
5. Partial cardiopulmonary bypass.
6. Types of pumps.
7. Modified cold prime cardioplegia.
8. Low urine output.

III. Short answers on: **(10 x 3 = 30)**

1. Priming volume.
2. Rotatory pumps.
3. Tubings in CPB.
4. Cell saver.
5. Protamine.
6. Oxygen dissociation curve.
7. Left ventricular Assist devices.
8. Hemostasis.
9. Biomedicus pump.
10. Canulation of the heart.

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[LK 0217] FEBRUARY 2017 **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Hemodynamic aspects of Cardio Pulmonary Bypass.
2. Induced Cardiac Arrest.
3. Hypothermia.

II. Write notes on: **(8 x 5 = 40)**

1. Coagulation cascade.
2. Oxygen Toxicity.
3. Biocompatible materials.
4. Nervous Control of Heart.
5. LV assist devices.
6. Blood surface interface.
7. Cerebral protection during Cardio Pulmonary Bypass.
8. Priming solution.

III. Short answers on: **(10 x 3 = 30)**

1. Extra corporeal membrane oxygen.
2. Intra Aortic Balloon Pump.
3. Circuit alarms.
4. Hematocrit.
5. Auto transfusion.
6. Roller pumps.
7. Electrolyte imbalance.
8. Venting of the heart.
9. Priming volume.
10. Gas transfer.

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[LL 0817] AUGUST 2017 **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. List out the essential monitoring device used during bypass and write short note on any two.
2. Explain principle of Extracorporeal membrane oxygenation with their types, cannulation sites, circuit.
3. Note on Adequacy of perfusion.

II. Write notes on: **(8 x 5 = 40)**

1. Principle of centrifugal pump.
2. Note of Activated clotting time and factors affecting the same.
3. Effects of Cardiopulmonary bypass on brain.
4. Formula to calculate the cardiopulmonary blood flow.
5. Oxygen dissociation curve.
6. On pump coronary artery bypass grafting - perfusionist role.
7. Write a note on Custodiol cardioplegia solution.
8. Note on Left ventricular assist device.

III. Short answers on: **(10 x 3 = 30)**

1. Write the uses of Mannitol during Cardiac Bypass.
2. Write about the disadvantages of Blood Prime.
3. Explain Respiratory Acidosis with an example.
4. Write about Bellow Pump.
5. Write the Formula to Calculate Bicarbonate correction.
6. Add a note on the priming solution to be used in Renal Failure patients.
7. Write about the role of Magnesium in Cardioplegic solution.
8. Write on the rationale behind using Hypothermia in cardiac surgery.
9. Write about the management of Anaemia on bypass.
10. Write about the various tubing’s and their characteristics used in Bypass.

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[LM 0218] FEBRUARY 2018 **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Principles of myocardial protection.
2. Intra-aortic balloon pump - principle, indication, contraindication, placement.
3. Types of hypothermia and brief notes on deep hypothermic circulatory arrest.

II. Write notes on: **(8 x 5 = 40)**

1. Describe about Heparin Induced Thrombocytopenia.
2. Effects of Cardiopulmonary bypass on kidney.
3. Cell saver and it uses in cardiac surgery.
4. Principle of bubble detector.
5. Explain about Splanchnic Circulation during Bypass.
6. Add a Note on Hematuria in the Perioperative Period.
7. Characteristic features of coated circuits.
8. Note on biventricular assist device.

III. Short answers on: **(10 x 3 = 30)**

1. Write about the various types of venous cannula and its importance.
2. Explain about Sickle cell Trait and precautions to be taken during bypass.
3. Write about the drug WARFARIN.
4. Write about Ventricular Pump.
5. Write the formula to Calculate Hemaocrit value during bypass.
6. Write on the principle of Hemodialysis.
7. What are the alternatives to Protamine?
8. Write about the rate of Rewarming and cooling during bypass.
9. Write about the sites of venting.
10. What are the causes of High arterial line pressures?

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[LN 0818] AUGUST 2018 **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Write in detail about alpha and ph stat and mention their pros and cons.
2. Distinguish Crystalloids vs. Colloids as priming solution for bypass.
3. Steps involved in oxygenator change out and reasons.

II. Write notes on: **(8 x 5 = 40)**

1. Design your own perfusion data sheet which covers all essential documentation?
2. Heparin resistance and management.
3. Principle of level sensor.
4. Retrograde autologous priming - Techniques - pros – con.
5. Precaution for known cold agglutinins patient during bypass.
6. Characteristic features of an ideal pump.
7. Note on warm blood cardioplegia.
8. Note on Right ventricular assist device.

III. Short answers on: **(10 x 3 = 30)**

1. Describe the uses of Bivalirudin in Cardiac surgery.
2. Write about the pros and cons of Roller pump.
3. Write about the role of Ringer Lactate solution as a priming solution.
4. Explain Respiratory Alkalosis with an example.
5. Write about Hyponatremia.
6. Write on the principle of Hemofiltration.
7. What are the causes of low Urine output during bypass?
8. How will you manage Gas Blender Failure during bypass?
9. Write the formula for correcting Hyperkalemia.
10. Write about the importance of arterial filter in the bypass circuit.

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[LO 0219] FEBRUARY 2019 **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Describe the steps in Initiating and going on Cardiopulmonary Bypass.
2. Write notes on Acid Base management in Cardio Pulmonary Bypass.
3. Describe Extracorporeal life support (ECLS) - indications, contraindications and placement.

II. Write notes on: **(8 x 5 = 40)**

1. Monitoring during Cardio Pulmonary Bypass.
2. Effects of cardiopulmonary bypass on the lungs.
3. Renal complications in cardiac surgery.
4. Write notes on Heparin reversal.
5. Describe the methods of Cerebral protection.
6. Methods of Cardioplegia administration.
7. Partial Cardio Pulmonary Bypass.
8. Myocardial protection during Cardio Pulmonary Bypass.

III. Short answers on: **(10 x 3 = 30)**

1. Describe the contribution of Wilfred Bigelow to Cardiac surgery.
2. What are the effects of Oxygen toxicity?
3. Write notes on Activated clotting time.
4. Describe after load and the causes of increased afterload.
5. Write notes on commonly used Inotropes and their mechanism of action.
6. Write notes on Anticoagulants.
7. Define Low cardiac output and mention how it is diagnosed?
8. Write notes on Deep hypothermic cardiac arrest.
9. Write notes on Hematuria after Bypass.
10. Describe the Venous drainage of the heart.

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[LP 0819] AUGUST 2019 **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY

Q.P. Code: 801422

Time: Three Hours **Maximum: 100 Marks**

Answer all questions

I. Elaborate on: **(3 x 10 = 30)**

1. Describe the steps in weaning off from cardiopulmonary bypass.
2. Types of hypothermia and write notes on deep hypothermic circulatory arrest.
3. Myocardial Protection in cardiac surgery.

II. Write notes on: **(8 x 5 = 40)**

1. Write notes on Heparinisation.
2. What are the alternatives to Heparin?
3. Intra-aortic balloon pump - principle, indications and contraindications.
4. Describe Veno-Arterial Extracorporeal membrane oxygenation.
5. Write notes on Canulation of the heart during bypass.
6. Write notes on Arterial Blood Gas and its uses.
7. Cell saver and it uses in cardiac surgery.
8. Write notes on Warfarin.

III. Short answers on: **(10 x 3 = 30)**

1. Hematocrit management on cardiopulmonary bypass.
2. Write notes on Low urine output in the post operative period.
3. Complications of Blood Transfusion.
4. ECG changes in Hyperkalemia.
5. Write on the principle of Hemodialysis.
6. Types of pumps used in bypass.
7. Write notes on venting of the heart.
8. Describe the contributions of Walton Lillehei to Cardiac surgery.
9. Write notes on Auto transfusion.
10. Describe Heparin Induced Thrombocytopenia.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LR 1220] DECEMBER 2020 Sub. Code: 1422
(AUGUST 2020 EXAM SESSION)

BACHELOR IN CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations from 2010-2011 & 2014-2015)
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY
Q.P. Code: 801422

Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Write a note on Transposition of Great Arteries, Total circulatory Arrest and Paediatric perfusion Protocols in detail.
2. What is Ultrafiltration? Types of it and principle involved and Fluid balance management during it on Bypass.
3. Alpha stat and PH stat management. Write a note on Acidosis and Alkalosis in detail.

II. Write notes on: **(8 x 5 = 40)**

1. NIRS monitoring Purpose and its usage in Cardiac surgery.
2. Oxygen Toxicity, Reperfusion Injury and Myocardial Stunning.
3. Blood conservation Methods and techniques.
4. Effects of CPB on Various Organs in short.
5. How do you calibrate the Heart Lung Machine and check the Occlusion and Mention various Occlusion setting Methods?
6. Clotting Mechanism and Various types of Clotting Factors.
7. VAVD principle and what are the Steps and Precautions Involved – Describe in detail.
8. Circle of Willis? Explain and Draw and Label and Anterograde Cerebral Perfusion methods and protocol.

III. Short answers on: **(10 x 3 = 30)**

1. Air Embolism Management on Pump.
2. What are the sources of Blood returning to the Heart during CPB?
3. Indications for Femoral Artery Bypass and describe the principle behind Venting of the Heart.
4. ECMO and its Types in short.
5. Harlequin syndrome in ECMO.
6. What is the Optimal Flow rates on CPB?
7. Positive and Negative Effects of Hypothermia.
8. Centrifugal Pump Advantages and Draw the Pump with parts.
9. Management of Sickle cell Anaemia cases in short.
10. HTK solution constituents and Role of it in Cardiac and other Surgeries.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0122] JANUARY 2022 Sub. Code: 1422
(FEBRUARY 2021 & AUGUST 2021 EXAM SESSION)

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations from 2010-2011 & 2014-2015)
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY
Q.P. Code: 801422

Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Principles of myocardial protection.
2. Distinguish Crystalloids vs. Colloids as priming solution for bypass.
3. Describe Extracorporeal life support (ECLS) - indications, contraindications and placement.

II. Write notes on: **(8 x 5 = 40)**

1. Add a Note on Hematuria in the Perioperative Period.
2. Anticoagulation for Cardio Pulmonary Bypass.
3. Principle of centrifugal pump.
4. Pre Cardiopulmonary Bypass check list.
5. Venous drainage of the heart.
6. Oxygen Toxicity.
7. Monitoring during Cardiopulmonary Bypass.
8. Methods of Cardioplegia administration.

III. Short answers on: **(10 x 3 = 30)**

1. Heparin reversal.
2. Hemostasis.
3. Hematocrit.
4. ECG changes in Hyperkalemia.
5. Protamine.
6. Low urine output.
7. Cardiotomy suckers.
8. Biomedicus pump.
9. Ventricular arrhythmia and its management.
10. Tubings in CPB.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0922] SEPTEMBER 2022 Sub. Code: 1422
(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations from 2010-2011 & 2014-2015)
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY
Q.P. Code: 801422

Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Pre-bypass checklist and steps for Initiation of Cardio Pulmonary Bypass.
2. Write an essay on VV – ECMO and its management.
3. Principles of ultrafiltration and add a detail note on CUF.

II. Write notes on: **(8 x 5 = 40)**

1. Explain partial Heart-Lung Bypass in detail.
2. Write a note on normovolemic hemodilution.
3. Cell saver and its uses.
4. Oxygen free radical scavengers.
5. Controlled cross circulation.
6. Adrenaline.
7. List the causes of low venous return.
8. Write a note on centrifugal pump.

III. Short answers on: **(10 x 3 = 30)**

1. Short notes on cold prime cardioplegia.
2. Roller pump.
3. ABG parameters.
4. Temperature monitoring sites.
5. Circuits and pump alarms.
6. Define preload and afterload.
7. Aprotinin.
8. Define reaction time.
9. Diastolic augmentation.
10. Priming Volume and composition.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0423] **APRIL 2023** **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY
Q.P. Code: 801422

Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Explain in detail about Anticoagulation management during CPB and ECMO.
2. Draw and label CPB circuit diagram for a 15 kg cyanotic child undergoing total repair for TOF.
3. Explain bubble oxygenator in detail.

II. Write notes on: **(8 x 5 = 40)**

1. Importance and procedure of occlusion checking.
2. Write a note on del – nido cardioplegia.
3. Importance of Hematocrit.
4. Protamine reactions and its management.
5. Uses of recirculation line and priming volume of membrane oxygenator.
6. Write a note on cardiotomy filter.
7. Bio line coated tubings.
8. Uses of CPB on liver transplant.

III. Short answers on: **(10 x 3 = 30)**

1. Left ventricular assist device indications.
2. Perfusion record.
3. Sites of venting of the heart.
4. Fick’s law.
5. Sources of Heparin.
6. EOPA cannulas.
7. Hemostasis.
8. Effective communication in conduct of CPB.
9. Oxygen free radicals.
10. Q 10 factor.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1123] **NOVEMBER 2023** **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY
Q.P. Code: 801422

Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Types of hypothermia and write notes on deep hypothermic circulatory arrest.
2. Intra-aortic balloon pump - principle, indication, contraindication, placement.
3. Complications of Cardio Pulmonary Bypass.

II. Write notes on: **(8 x 5 = 40)**

1. Write on the principle of Hemofiltration.
2. Effects of priming solutions on RBCs.
3. Heparinisation and its reversal.
4. Principle of bubble detector.
5. Cannulation of the heart during bypass.
6. Principles of ECMO.
7. Causes of Cerebral Injury in Cardio Pulmonary Bypass.
8. Custodiol cardioplegia solution.

III. Short answers on: **(10 x 3 = 30)**

1. Autotransfusion.
2. Write the formula to Calculate Bicarbonate correction.
3. Priming volume.
4. List causes of low venous return.
5. Importance of activated clotting time during Cardio Pulmonary Bypass.
6. Oxygen toxicity.
7. Inotropes.
8. Hyperkalemia- causes and management during Cardio Pulmonary Bypass.
9. Left ventricular Assist devices.
10. Circuit alarms.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0424] **APRIL 2024** **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY
Q.P. Code: 801422

Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. List out the essential monitoring device used during bypass and describe any two.
2. Types of Hypothermia and describe Deep Hypothermic Circulatory arrest.
3. Acid Base Management in Cardio Pulmonary Bypass.

II. Write notes on: **(8 x 5 = 40)**

1. Types of Pumps, principle and benefits of Centrifugal Pump.
2. Define Ideal Perfusion. Explain about Monitoring devices.
3. Cell saver and it uses in Cardiac Surgery.
4. Neurological effects of Cardio Pulmonary Bypass.
5. Methods of Cardioplegia Administration.
6. Define Extra Corporeal Membrane Oxygenation and explain any one in detail.
7. Arterial Blood Gas and its uses.
8. Basic setup steps, indications and contraindications of Intra Aortic Balloon Pump.

III. Short answers on: **(10 x 3 = 30)**

1. Induced Cardiac arrest – Principles.
2. Oxygen toxicity.
3. Hyperkalemia and its treatment.
4. Effects of partial heart lung bypass on organs.
5. Electrolyte and water balance.
6. Ventricular Assist devices – Indications and Contraindications.
7. Lasix.
8. Blood prime and Priming solutions.
9. LV assists devices.
10. Write the formula to Calculate Hematocrit value during Bypass.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0125] **JANUARY 2025** **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY
Q.P. Code: 801422

Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Describe the various techniques used for blood salvage and conservation during CPB.
2. Explain the conduct of CPB for an adult male weighting 73 kgs undergoing MVR.
3. Explain the systemic response to CPB according to organ system.

II. Write notes on: **(8 x 5 = 40)**

1. Blood filters.
2. Albumin and its uses.
3. Methods of occlusion checking.
4. LV assist devices – LVAD, RVAD.
5. Types and complications of VAD.
6. Timing errors of IABP.
7. Coagulation pathway.
8. Absolute and relative indications for femoral cannulation and its complications.

III. Short answers on: **(10 x 3 = 30)**

1. Causes of high line pressure.
2. Cardioplegia.
3. Oxygen toxicity.
4. Perfusion emergencies.
5. Role of diuretics in CPB.
6. BI – VAD.
7. Low venous return.
8. Steroids.
9. Gas filters.
10. Difference between adult and pediatric circuits.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0425] **APRIL 2025** **Sub. Code: 1422**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY
Q.P. Code: 801422

Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Adequacy of Perfusion during Cardio Pulmonary Bypass.
2. Cardio Pulmonary Bypass Circuit diagram incorporating all components.
3. What is Ultrafiltration? Explain the types, principles involved and fluid balance management during Bypass.

II. Write notes on: **(8 x 5 = 40)**

1. Partial Cardio Pulmonary Bypass.
2. Principle of Centrifugal Pump and explain with a diagram.
3. Effect of perfusion on brain, heart and lungs.
4. Cell saver and its uses in Cardiac Surgery.
5. Reperfusion injury and Myocardial stunning.
6. Alpha stat and pH stat management.
7. Types of Cardioplegia and methods of Administration.
8. What is Extra Corporeal membrane oxygen? Explain any one type in detail.

III. Short answers on: **(10 x 3 = 30)**

1. Hematocrit management on Cardiopulmonary Bypass.
2. List the three effects of priming solution on RBC.
3. Define Cardioplegia.
4. Write about the importance for Arterial filter in the Bypass circuit.
5. Retrograde Autologous priming.
6. Define Biomedicus pump.
7. Deep Hypothermic cardiac arrest.
8. Protamine reversal.
9. Diastolic augmentation.
10. Ventricular Pump.

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THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

[AHS 1125] **NOVEMBER 2025** **Sub. Code: 1422**

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THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER II – CARDIOPULMONARY BYPASS & PERFUSION TECHNOLOGY
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Time: Three Hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Cannulas used in CPB – types and selection criteria.
2. What is an ideal oxygenator? Discuss the types of Oxygenator.
3. Write a note on Myocardial preservation, strategies involved in Cardiopulmonary bypass.

II. Write notes on: **(8 x 5 = 40)**

1. Coronary artery disease and Anatomy of Coronary circulation.
2. Transmission of fluids at capillaries.
3. Centrifugal pump vs Roller pump - Differentiate
4. Causes of poor venous return during CPB.
5. Positive and Negative effects of Hemodilution.
6. Principles of membrane oxygenation.
7. Pre-bypass check list.
8. Degrees of Hypothermia.

III. Short answers on: **(10 x 3 = 30)**

1. Cardiac output.
2. Preload and afterload.
3. Oxygen toxicity.
4. Retrograde cardioplegia.
5. Leucocyte depleting filters.
6. Heparin dosing.
7. Normal perfusion flow.
8. Crystalloid cardioplegia vs Blood cardioplegia.
9. Timing of IABP.
10. Retrograde autologous Priming.

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