[LD 0212] AUGUST 2013 Sub. Code:1423

B.Sc., CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER III - CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Cardioplegia solution & its delivery
2. Components of Cardiopulmonary bypass circuit
3. Checklist before going on cardiopulmonary bypass

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

1. Role of Heparin in CPB
2. Coagulation path ways
3. Draw Rough Diagram of a extracorporeal circuit
4. Activated clotting time(ACT)
5. Pump Priming.
6. Air lock & its solution.
7. Loss of electrical power during cardiopulmonary bypass.
8. Periodic maintenance of heart lung machine

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

1. Factors activated on contact of blood with extracorporeal circuit
2. Centrifugal pumps
3. Membrane Oxygenator
4. Preoperative investigations for CPB
5. Mean arterial pressure during CPB
6. Steps for aspesis during assembling circuit
7. Hemotherm
8. Arterial line filter
9. Cooling and rewarming for circulatory arrest.
10. Hemofilter

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[LE 0212] FEBRUARY 2014 Sub. Code: 1423

B.Sc., CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER III - CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Pre bypass check List
2. Gas exchange in Oxygenator
3. Inadequate systemic pressure during cardiopulmonary bypass

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

1. Flow rates & desired canula sizes
2. Systemic flow rates
3. ACT(activated clotting time)
4. PH management during cardiopulmonary bypass
5. High arterial line pressure
6. Inadequate Cardioplegia delivery
7. Assembling of circuit of heart lung machine
8. Hemotherm

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

1. Complications of aortic canulation
2. Loss of electrical power during CPB
3. Mean BP during bypass
4. Deep hypothermic circulating arrest
5. Hematuria
6. Significance of Liver function & Renal function tests
7. Echocardiograph
8. Oxygenator malfunction
9. Air entry into venous line
10. Modified ultra filtration

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[LF 0212] **AUGUST 2014** **Sub. Code:1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER III - CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Typical perfusion record
2. Components of Cardiopulmonary bypass circuit
3. Membrane Oxygenator

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

1. Role of Heparin in CPB
2. Coagulation pathways
3. Systemic flow rates
4. PH management during cardiopulmonary bypass
5. High arterial line pressure
6. Temperature management during bypass
7. Inadequate venous drainage
8. Potassium measurement & its importance

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

1. Retrograde cerebral perfusion
2. Assisted venous drainage
3. Complication of aortic cannulation
4. Loss of electrical power during CPB
5. Chest X-Ray
6. Liver function tests
7. Coagulation factors activated on contact with extracorporeal circuit
8. Hemotherm
9. Hemolysis
10. Air entry into venous line

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[LG 0215] **FEBRUARY 2015** **Sub. Code:1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER III - CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Complication while initiating bypass.
2. Periodic maintenance of heart lung machine
3. Assembling and preparing circuits for heart lung machine.

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

1. Air lock and its solution.
2. Pump Priming.
3. ACT (activated clotting time)
4. Hemotherm
5. Rewarming and cooling
6. HIT (Heparin induced thrombocytopenia)
7. Systemic air embolism
8. Flow rates and desired cannula sizes.

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

1. Angiography.
2. Renal function tests.
3. Centrifugal pumps.
4. Preoperative investigations for CPB.
5. Hematuria.
6. Modified ultrafiltration.
7. Surgical asepsis.
8. Potassium measurement and its importance.
9. Filters used in bypass.
10. Terminating bypass.

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[LH 0815] **AUGUST 2015** **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Surgical asepsis.
2. Check list before going on cardiopulmonary bypass.
3. Complications while initiating cardiopulmonary bypass.

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

1. Heparin included thrombocytopenia.
2. Systemic air embolism.
3. Flow rates and desired cannula sizes.
4. Inadequate systemic oscygeneration.
5. Periodic maintenance of heart lung machine.
6. High arterial line pressure while on cardiopulmonary bypass.
7. Coagulation Pathway.
8. Inadequate venous drainage while on cardiopulmonary bypass.

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

1. Heparin management during cardiopulmonary bypass.
2. Liver function tests.
3. Hematuria causes and treatment.
4. Terminating bypass – complications and precautions.
5. ECG – Its significant to perfusionist.
6. Blood glucose.
7. Deep hypothermic circulatory arrest.
8. Assisted venous drainage.
9. Loss of electrical power during cardiopulmonary bypass.
10. Hemotherm design and its uses.

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[LI 0216] FEBRUARY 2016 **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Prebypass check list.
2. Complications while initiating bypass.
3. Assembling and preparing circuits for heart lung machine.

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

1. ECHO and Cardiopulmonary Bypass.
2. Pump priming.
3. Ph management during cardiac pulmonary Bypass.
4. Air lock and its solution.
5. Hypothermia.
6. Skin preparation for surgical procedure.
7. Activated clotting time.
8. Systemic flow rates.

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

1. Blood glucose monitoring during CPB.
2. Loss of electrical power during CPB.
3. Hemolysis.
4. Importance of chest X-ray to perfusionist.
5. Name of commonly used sites for temperature monitoring.
6. Coagulation factors activated on contact with extra corporeal circuit.
7. ECG—> Interpretation.
8. Renal function tests.
9. Coronary angiogram.
10. Liver function tests and their assessment.

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[LJ 0816] AUGUST 2016 **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Describe about Heparin and its pathway with diagram. Discuss in detail about Heparin Induced Thrombocytopenia.
2. Write a note on Reperfusion Injury and problems faced in Long Pump run/cross clamp.
3. Define SIRS (Systemic Inflammatory Response Syndrome) and also explain it and also describe the common CPB complications.

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

1. Role of Hemofilteration in CPB and list out the inflammatory Mediators.
2. Temperature related complication on CPB – Explain in detail.
3. List out all the blood conservations techniques and discuss it.
4. What is Sickle Cell Anaemia? Write down the perfusion technique of it.
5. Effects and complications of CPB on various organs.
6. Complications of IABP and draw a picture of positioning of IABP.
7. TCA protocol – and how safe you can give low flows at different temperature – prepare a chart?
8. Jehovah witness cases and perfusion technique for it.

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

1. How will you perform MUF safely without any complications? Specify the anticipated complications and also explain to overcome it?
2. Why Monitoring Lactate level on CPB is important? How does it help the Perfusionist.
3. How will you rectify and manage the heparin Resistance Cases?
4. What are the causes of Poor Venous Return and what will be your management?
5. What is Alpha stat and Ph stat?
6. How will you manage when Venous return is low and Venous return Overflow?
7. What is ECMO and state its benefits and discuss ECMO related complications?
8. Role of a Perfusionist in avoiding infections related to HLM and Hemotherm Maintenance.
9. What can cause Hemolysis/Hematuria on CPB and how will you manage it?
10. What is Pulsatile Perfusion?

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[LK 0217] FEBRUARY 2017 **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY

THIRD YEAR

PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Jehovah witness cases and it perfusion technique and write a note on Sickel Cell Anaemia management on CPB.
2. Write an essay on Heparin.
3. Write a note on Reperfusion Injury, oxygen Free Radicals, and also inflammatory Mediators in CPB. How will you manage such complications?

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

1. What is ECMO and state its benefits and discuss ECMO related complications?
2. Temperature related complication on CPB – Explain in detail.
3. List out all the blood conservations techniques and discuss it.
4. What are all the safety devices can be used to prevent the CPB Complications?
5. Effects and complications of CPB on various organs.
6. Indication, contraindication and complications of IABP.
7. TCA protocol – and how safe you can give low flows at different temperature – prepare a chart.
8. State the pediatric perfusion protocol and highlight its importance.

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

1. What will cause Hyperkalemia in Pump? How will you overcome it?
2. What can cause Hemolysis/Hematuria on CPB and how will you manage it.
3. How will you rectify and manage the heparin Resistance Cases?
4. What are the causes of Poor Venous Return and what will be your management?
5. What is Alpha stat and Ph stat?
6. How will you manage when Venous return is low and Venous return Overflow?
7. What is hand Crank? What is its importance?
8. Role of a Perfusionist in avoiding infections related to HLM and Hemotherm Maintenance.
9. How will you perform MUF safely without any complications? Specify the anticipated complications and also explain to overcome it?
10. Why Monitoring Lactate level on CPB is important? How does it help the Perfusionist?

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[LL 0817] AUGUST 2017 **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Explain briefly on the following special investigations a) Echocardiography b) Angiography c) Liver function test d) Renal function test.
2. Write in detail on rate of Rewarming and cooling in Cardiopulmonary bypass and explain grades of hypothermia and safety margin of how flows can vary with temperature. Prepare a flow chart according to the temperature.
3. Elaborate on the complications while initiating and at the termination of bypass.

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

1. Causes of poor venous return, its management and remedy.
2. Management of air in the arterial line of the circuit.
3. Brief about the periodic maintenance of the Hemotherm.
4. How will you manage renal failure patient on cardiopulmonary bypass? Mention about Conventional ultra filtration.
5. What are the Essential parameters monitored on cardiopulmonary bypass and state some safety devices in extracorporeal circuit?
6. Write short notes on Alternatives of Heparin.
7. Explain about Skin preparation for Cardiac surgery.
8. Define Surgical Asepsis and advocate its importance in Cardiac surgery.

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

1. What is Hand crank and when it is used?
2. Write short notes on importance of Potassium value during Cardiopulmonary bypass.
3. How will you treat Massive air embolism?
4. Mention about the indication and importance of Blood priming during cardiopulmonary Bypass.
5. Write short notes on Endocrine assays for Cardiopulmonary Bypass.
6. What is the importance of Level sensor in the cardiopulmonary circuit and write its working principle?
7. State the importance of Arterial Filter in the CPB circuit and also mention its pore size.
8. How can you prevent Hematuria on Bypass?
9. What is Alpha stat and pH stat?
10. Retrograde cerebral perfusion

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[LM 0218] FEBRUARY 2018 **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Elaborate on the complications while initiating and during cardiopulmonary bypass.
2. Write briefly on surgical asepsis in assembling cardiopulmonary bypass circuits and handling circuits from the surgeon.
3. Explain in detail about the routine investigation done for cardiac surgery and their importance to the perfusionist.

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

1. What is Heparin induced thrombocytopenia and its management?
2. What is Stone heart, what are the causes and remedy?
3. Explain about the common strategies to be taken for sickle cell anemia patients undergoing cardiopulmonary bypass.
4. Explain about the cleaning protocol for Hemotherm and brief about the periodic maintenance of the heart lung machine.
5. How will you wean off from cardiopulmonary bypass, mention all parameters?
6. Write a note on the Temperature management in Cardiopulmonary bypass.
7. What are the causes for hematuriaon bypass and its management?
8. Write short notes on prebypass checklist and its importance.

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

1. What is the importance of Chest X-ray for cardiopulmonary bypass?
2. Write the formula for calculating patient body surface area, blood volume and circulating blood volume.
3. What are the causes of poor venous return and management strategies?
4. Action of chlorhexidine in skin preparation.
5. Explain the role of Gas filter in a bypass circuit.
6. What is Total circulatory arrest and its indications and techniques?
7. Write about the significance of Lactate in cardiopulmonary bypass.
8. Application of leukocytes depleting filters and uses.
9. Write note on loss of electrical power during cardiopulmonary bypass and its Management.
10. How will you clean the Heart Lung Machine after the biohazard procedure?

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[LN 0818] AUGUST 2018 **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Elaborate on the complications. During and termination of Cardiopulmonary bypass.
2. Write the components of Cardiopulmonary bypass circuit, Support your answer with the basic bypass circuit diagram with label.
3. Explain briefly on the following special investigations a) Echocardiography b) Angiography c) Liver function test d) Renal function test.

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

1. When do you conclude heparin resistance and its management?
2. What is the pore size of Arterial filter, Gas filter and Cardiotomy filter? Where will you incorporate exactly in your bypass circuit?
3. As a perfusionist what are the precautions will you take while cooling and rewarming the patient to avoid cerebral damage?
4. Write down on the policies of maintenance on heart lung machine and cleaning protocol executed in your institution for Hemotherm and heart lung machine.
5. Explain about Alpha stat and pH stat.
6. What are the possible causes for ECG activity during cardioplegic arrest?
7. How do you manage the loss of electrical power during cardiopulmonary bypass?
8. Elaborate about pre bypass checklist and its importance.

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

1. Retrograde cerebral perfusion and its uses.
2. Explain the importance of bubble detector in the cardiopulmonary bypass circuit and its working principle.
3. Write about the cardiopulmonary bypass implication of increased cardiothoracic ratio on a chest x-ray.
4. Mention about the types of Hypothermia with its Temperature range.
5. Pre bypass filter, its pore size and importance.
6. What is Sickle cell anemia, write down the perfusion technique?
7. Glucose management during bypass.
8. Mention the common complications during Aortic and Venous Cannulation.
9. Name the sites of Temperature monitoring.
10. Write what are the differences between Adult and Paediatric Cardiopulmonary bypass circuits?

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[LO 0219] FEBRUARY 2019 **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Components of Cardiopulmonary bypass circuit.
2. Write in detail on rate of Rewarming and cooling in Cardiopulmonary bypass and explain grades of hypothermia and safety margin of how flows can vary with temperature? Prepare a flow chart according to the temperature.
3. Checklist before going on cardiopulmonary bypass.

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

1. Pump Priming.
2. Heparin Induced Thrombocytopenia (HIT).
3. Coagulation pathway.
4. Effects and complications of CPB on various organs.
5. ECHO and cardiopulmonary bypass.
6. List out all the blood conservations techniques and discuss it.
7. Systemic air embolism.
8. Mention all parameters while wean off from cardiopulmonary bypass.

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

1. Define ECMO and state its benefits and discuss ECMO related complications?
2. Preoperative investigations for CPB.
3. Angiography.
4. Potassium measurement and its importance.
5. Heparin management during cardiopulmonary bypass.
6. ECG – Interpretation.
7. Importance of chest X-ray for CPB.
8. Pulsatile perfusion.
9. Steps for asepsis during assembling circuit.
10. Oxygenator malfunction.

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[LP 0819] AUGUST 2019 **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

Answer all questions

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

1. Assembling and preparing circuits for heart lung machine.
2. Cardioplegia solution and its delivery.
3. Explain briefly on the following special investigations (a) Echocardiography (b) Angiography (c) Liver function test (d) Renal function test

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

1. Indications and contra indications of the use of Intra-aortic Balloon counter pulsation.
2. Ph management during cardiopulmonary bypass.
3. Air lock and its solution.
4. Hemotherm.
5. Skin preparation for invasive procedures.
6. State the pediatric perfusion protocol and highlight its importance.
7. Draw rough diagram of an extracorporeal circuit.
8. Rewarming and Cooling.

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

1. Loss of electrical power during CPB.
2. Causes of poor venous return and management strategies.
3. Filters used in bypass.
4. Terminating bypass.
5. Hemoglobinuria.
6. Prevention of hematuria on bypass.
7. Retrograde cerebral perfusion and its uses.
8. Differences between Adult and Paediatric Cardiopulmonary bypass circuits?
9. Centrifugal pumps.
10. Membrane oxygenator.

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

[LR 1220] **DECEMBER 2020** **Sub. Code: 1423**
(AUGUST 2020 EXAM SESSION)

BACHELOR IN CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulation from 2010-2011 & 2014-2015)
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE
Q.P. Code: 801423

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

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

1. Components of Cardiopulmonary bypass circuit.
2. Write in detail on rate of Rewarming and cooling in Cardiopulmonary Bypass and explain grades of Hypothermia and safety margin of how flows can vary with temperature. Prepare a flow chart according to the temperature.
3. Checklist before going on Cardiopulmonary Bypass.

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

1. Pump Priming.
2. Heparin Induced Thrombocytopenia (HIT).
3. Coagulation pathway.
4. Effects and complications of CPB on various organs.
5. ECHO and Cardiopulmonary Bypass.
6. List out all the Blood conservations techniques and discuss it.
7. Systemic Air Embolism.
8. Mention all parameters while wean off from Cardiopulmonary Bypass.

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

1. Define ECMO and state its benefits and discuss ECMO related complications?
2. Preoperative investigations for CPB.
3. Angiography.
4. Potassium measurement and its importance.
5. Heparin management during Cardiopulmonary Bypass.
6. ECG – Interpretation.
7. Importance of chest X-ray for CPB.
8. Pulsatile perfusion.
9. Steps for asepsis during Assembling Circuit.
10. Oxygenator Malfunction.

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

[AHS 0122] JANUARY 2022 Sub. Code: 1423
(FEBRUARY 2021 & AUGUST 2021 EXAM SESSION)

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulation from 2010-2011 & 2014-2015)
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE
Q.P. Code: 801423

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

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

1. Discuss in detail about various pumps used in Cardiopulmonary bypass.
2. Draw a neat labeled diagram of cardiopulmonary bypass circuit and describe in detail about the conduct of cardiopulmonary bypass.
3. Enlist the complications of cardiopulmonary bypass. Describe in detail about massive air embolism and its management.

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

1. Role of protamine in Cardiopulmonary bypass.
2. Heparin induced thrombocytopenia.
3. Discuss about retrograde cardioplegia in detail.
4. Cleaning and maintenance of Heart – lung machine.
5. Causes and management of low venous return during Cardiopulmonary bypass.
6. Pre-bypass checklist.
7. Write briefly about Extra-corporeal membrane oxygenator.
8. Precautions to be taken during rewarming.

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

1. What is respiratory acidosis?
2. Enlist the complications of aortic cannulation.
3. Venting in cardiopulmonary bypass.
4. Two-stage single venous cannula.
5. Terminating bypass.
6. Adrenaline.
7. Arterial line filter.
8. What is Deep hypothermic circulatory arrest?
9. Priming solution.
10. Liver function tests.

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

[AHS 0922] SEPTEMBER 2022 Sub. Code: 1423
(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations from 2010-2011 & 2014-2015)
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE
Q.P. Code: 801423

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

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

1. Enlist the complications of cardiopulmonary bypass. Describe in detail about myocardial protection.
2. Define Cardioplegia. Enlist different types of cardioplegic solutions. Discuss about retrograde cardioplegia in detail.
3. Discuss in detail about pre-bypass checklist. Add a note on trouble shooting during cardiopulmonary bypass.

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

1. Role of heparin in Cardiopulmonary bypass.
2. Explain how to maintain surgical asepsis in HLM.
3. Precautions to be taken during rewarming.
4. Write short notes on priming solutions.
5. Management of power failure during Cardio Pulmonary Bypass.
6. Discuss briefly about various types of venous cannula.
7. Write briefly about Intra –aortic balloon pump.
8. Cleaning and sterilization techniques of cannulas.

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

1. Write short notes on causes of cerebral damage post Cardio Pulmonary Bypass.
2. Draw a neat labeled diagram of ECG wave.
3. Defibrillator.
4. Surgeries which need femoral cannulation.
5. Terminating bypass.
6. Short note on Ventricular Assisting Devices.
7. Arterial line filter.
8. What is Deep hypothermic circulatory arrest?
9. Causes of Hemolysis and its management.
10. Alarms used in Cardiopulmonary bypass.

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

[AHS 0423] **APRIL 2023** **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE
Q.P. Code: 801423

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

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

1. Elaborate on the complications during and termination of Cardiopulmonary bypass.
2. Write the components of Cardiopulmonary bypass circuit, support your answer with the basic bypass circuit diagram by labeling.
3. Elaborate on preparation and assembling of circuits on Heart Lung Machine and filters under surgical asepsis.

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

1. Role of Heparin in CPB.
2. Periodic maintenance of Heart Lung Machine.
3. Air lock and its solution.
4. Flow rates and desired cannula sizes.
5. Activated Clotting Time (ACT).
6. Skin preparation for invasive procedures.
7. Temperature management during bypass.
8. Short notes on priming solutions.

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

1. What is Alpha stat and pH stat?
2. How will you manage when venous return is low and venous return Overflow?
3. What is ECMO and state its benefits and discuss ECMO related complications.
4. Role of a Perfusionist in avoiding infections related to HLM and Hemotherm Maintenance.
5. What can cause Hemolysis/Hematuria on CPB and how will you manage it?
6. What is Pulsatile Perfusion?
7. What is Hand crank and when it is used?
8. The indication and importance of Blood priming during Cardiopulmonary Bypass.
9. Retrograde cerebral perfusion.
10. Renal function test.

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

[AHS 1123] **NOVEMBER 2023** **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS
STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE
Q.P. Code: 801423

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

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

1. Types of Cardioplegia and describe methods of Delivery.
2. Complications during Cardiopulmonary Bypass.
3. Causes and management of Inadequate Systemic Pressure during Cardiopulmonary Bypass.

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

1. Management of pH during Cardiopulmonary Bypass.
2. Alternate sites for Cannulation in a porcelain (calcified) Aorta.
3. Management of Air entry into venous line.
4. Complications while initiating the bypass.
5. What is Hypothermia and describe deep Hypothermia.
6. How do you remove air from the Oxygenator?
7. Common investigation used before CPB.
8. Sterile method of assembling the circuit.

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

1. Fundamentals of Pace makers.
2. Surgical asepsis for invasive procedure.
3. Pulsatile perfusion.
4. Auto transfusion.
5. Hemodilution.
6. Hemoglobinurea.
7. ECMO maintenance.
8. Method to monitor Cerebral Oxygen Delivery.
9. Ventricular assist device
10. Drugs used to increase systemic vascular resistance.

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

[AHS 0424] **APRIL 2024** **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS
STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE

Q.P. Code: 801423

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

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

1. Safety methods and management of Accidents during Cardiopulmonary Bypass.
2. Extra Corporeal Membrane Oxygenator – Uses and Complications.
3. Stroke during Cardiopulmonary Bypass – Causes and Prevention.

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

1. Different types of Oxygenators.
2. Cerebral protection during Cardiopulmonary Bypass.
3. Intra Aortic Balloon Pump – Uses and Complications.
4. Indications for Deep Hypothermic Circulatory arrest.
5. Pre-operative investigations for Cardiopulmonary Bypass.
6. Parameters to be monitored on Cardiopulmonary Bypass.
7. Causes for Low mean arterial pressure.
8. Left Ventricular assists devices.

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

1. Specify the management of loss of electrical power during CPB.
2. Define Heparin reversal.
3. Enlist the methods of measuring of tissue oxygen.
4. Define Reperfusion injury.
5. Mention any three methods in maintenance of asepsis during Cardiopulmonary bypass.
6. List any three factors influencing venous drainage.
7. Enlist any three causes and prevention of Systemic Air embolism.
8. Define Retrograde Cardioplegia.
9. Define Cardio frequency ablation.
10. List any three uses of Air – Oxygen blender.

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

[AHS 0125] **JANUARY 2025** **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS
STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE
Q.P. Code: 801423

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

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

1. Note on Reperfusion injury and problems faced in long pump run / cross clamp.
2. Describe the various techniques of arterial and venous cannulation and its complications.
3. Pre-Bypass checklist.

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

1. DHTCA.
2. VAVD.
3. Management of loss of electrical power supply during CPB.
4. Management of air entry into venous line.
5. Chest X-ray.
6. pH management during CPB.
7. Complications while initiating CPB.
8. Heat exchanger devices.

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

1. Free radical scavenger.
2. Ischemic period.
3. Gas line filters.
4. Causes of low venous return.
5. Modified ultra filtration.
6. RVAD.
7. Mechanism of action of heparin.
8. Adult and Pediatric Cannulas.
9. Dobutamine.
10. Albumin and its uses.

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

[AHS 0425] **APRIL 2025** **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE
Q.P. Code: 801423

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

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

1. Describe the conduct of Cardio Pulmonary Bypass (CPB) for a 70-year-old male who is undergoing Aortic Valve Replacement (AVR) with Hb- 9g/dl.
2. Describe in detail about Ventricular assist device.
3. ECMO for Cardiac support.

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

1. Cell saver and its uses.
2. Timing errors of Intra Aortic Balloon Pump (IABP).
3. Topical agents for blood conservation.
4. Autologous blood donation.
5. Transfusion reaction.
6. Venting of the Heart.
7. Heparin induced thrombocytopenia.
8. Hematocrit.

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

1. Draw a diagram of Membrane oxygenator.
2. Air embolism.
3. Frank starling's law.
4. St. Thomas cardioplegia.
5. Factors affecting Activated Clotting Time (ACT).
6. Complications of ECMO.
7. Inadequate venous drainage.
8. Causes of high line pressure.
9. Sickle cell anemia management on Cardio Pulmonary Bypass CPB.
10. Cross circulation.

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

[AHS 1125] **NOVEMBER 2025** **Sub. Code: 1423**

B.Sc. CARDIO PULMONARY PERFUSION CARE TECHNOLOGY
THIRD YEAR – (Regulations 2010-2011, 2014-2015 & 2018-2019 onwards)
PAPER III – CARDIO PULMONARY BYPASS AND ITS COMPLICATIONS
STERILE TECHNIQUES AND SURGICAL ASEPSIS MAINTENANCE
Q.P. Code: 801423

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

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

1. Describe the benefits of hemodilution and physiological consequences of hemodilution.
2. Explain in detail about Intra-Aortic Balloon Pump (IABP) and its complications.
3. Explain the conduct of Cardiopulmonary Bypass **(**CPB) of an infant weight 8 kgs, patient posted for VSD.

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

1. Write a note on Hypothermia.
2. Contributions of Bigelow to CPB.
3. Write a note on antegrade Cardioplegia.
4. pH stat.
5. Pulsatile perfusion.
6. Significance of leukocyte depleting filter.
7. Write a note on Bubble oxygenator.
8. Filter and Bubble trap used in CPB.

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

1. Define Cardiac output and stroke volume.
2. Body surface area.
3. Conventional ultrafiltration.
4. Importance of hand crank.
5. Correction of hyperkalemia.
6. Custodial solution.
7. Role of perfusionist in Off-Pump Coronary Artery Bypass Graft (OPCAB).
8. Occlusion checking.
9. Colloidal solutions.
10. Protamine reactions.

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