BLDE (DEEMED TO BE UNIVERSITY)

Jan-26

B.Sc. in Cardiac Perfusion Technology

[Time: 3 Hours] **[Max. Marks: 80]**

IV SEMESTER

PAPER - I (Advanced Perfusion Techniques Paper I)

QP CODE: 8460

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Questions — 10X1 = 10 Marks

1. What is Deep Hypothermic Circulatory Arrest (DHCA)? Explain why and how it is done.

Short Essays: (Any – 8) — 5 X 8 = 40 Marks

2. Explain pH-stat vs Alpha-stat strategies in CPB blood-gas management with clinical uses.
3. Explain why venous saturation (SvO_2) and urine output are used as perfusion adequacy indicators.
4. During cross-clamp period: describe essential perfusionist responsibilities and critical monitoring.
5. Preparation for weaning from CPB: describe rewarming criteria, de-airing techniques, and hemodynamic stabilization.
6. Write a brief note on antegrade vs retrograde cardioplagia delivery routes with indications.
7. Explain neurological protection strategies during DHCA including cooling and adjunct perfusion techniques.
8. What is systemic inflammatory response syndrome (SIRS) during CPB? Describe mechanism and prevention.
9. Write a short note on Heparin and Protamine used in CPB including mechanism, dose, and complications.
10. What is autologous priming (RAP/VAP)? Write steps and clinical benefits.

Short Answers: (Any – 10) — 3 X 10 = 30 Marks

11. Describe line pressure monitoring and explain why it is critical during CPB.
12. What is cerebral oximetry (NIRS)? Mention one clinical application during surgery.
13. What is zeroing of pressure transducer? Why must it be performed before CPB?
14. List any three essential pre-bypass safety checks before starting CPB.
15. Mention the ideal temperature range for DHCA and the maximum safe duration for circulatory arrest.
16. List two indicators of adequate myocardial protection while cross-clamp is applied.
17. State one difference between blood and crystalloid cardioplagia with examples.
18. Mention two ultrafiltration techniques used during CPB with one indication each.
19. State two indications for retrograde cerebral perfusion during DHCA.
20. Name any three blood products used during CPB and their role.
21. Mention any two gas laws related to CPB and write one clinical application for each.

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IV SEMESTER

PAPER - II (Advanced Perfusion Techniques Paper II)

QP CODE: 8461

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Questions **10X1 = 10 Marks**

1. Explain the structure, types, and working principles of membrane oxygenators used in CPB.

Short Essays: (Any – 8) **5 X 8 = 40 Marks**

2. Define a transducer and explain its importance in medical monitoring and CPB.
3. What is mechanical circulatory support? Write briefly about the purpose of IABP.
4. What is cardiomegaly? How is it identified on a chest X-ray?
5. Describe the principle and clinical use of the ACT machine.
6. Write post-procedure care and hemostasis after coronary angiography.
7. What is oxygenator failure? Mention common troubleshooting steps.
8. Describe the principles and types of defibrillators.
9. What are the types of cardioplagia? Write cold vs warm cardioplagia in brief.
10. Explain radial and femoral arterial access for coronary angiography.

Short Answers: (Any – 10) **3 X 10 = 30 Marks**

11. What is cerebral oximetry (NIRS)?
12. What is the normal MAP target during CPB? Explain in short.
13. Give one cause and one effect of SIRS in CPB.
14. Define oncotic pressure and why it decreases during CPB.
15. Define myocardial preservation.
16. What are the normal values of ACT during CPB and the Cath lab?
17. List any three parameters shown in an anesthesia monitor.
18. Name any two types of diagnostic catheters used in coronary angiography.
19. What is ventricular fibrillation?
20. What is a lateral chest X-ray view?
21. Write any three types of temperature probes.

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[Time: 3 Hours] [Max. Marks: 80]

IV SEMESTER

PAPER - II (PT Directed Clinical Education II)

QP CODE: 8462

Long Questions **10X1 = 10 Marks**

1. Explain myocardial infarction and list ECG changes seen in MI

Short Essays: (Any – 8) **5 X 8 = 40 Marks**

2. Describe ECG findings in mitral stenosis and regurgitation.
3. Explain the mechanism of AV nodal re-entry tachycardia.
4. Discuss ECG changes in hyperkalaemia and hypokalaemia.
5. Describe the assessment of LV systolic and diastolic function in heart failure.
6. Explain the standard views used in Transoesophageal Echocardiography.
7. Describe Doppler findings in mitral valve prolapse.
8. Explain the echo features of myocardial infarction and its complications.
9. Discuss the echo assessment of prosthetic valve malfunction.
10. Describe the role of echo in detecting myocardial hibernation.

Short Answers: (Any – 10) **3 X 10 = 30 Marks**

11. ECG changes in LBBB
12. Aortic regurgitation – echo findings
13. Sinus re-entry mechanism
14. Pericardial effusion – echo features
15. Contraindications of TOE
16. Types of aortic stenosis
17. Electrical remodelling of atria
18. Hypertrophic cardiomyopathy
19. Echo findings in infective endocarditis
20. Hypercalcemia – ECG changes
21. Tricuspid stenosis – echo findings