Answer Key

BCA /B. Com/ B.Sc Degree Examinations – February/2024

Continuous Assessment I

Common to all BCA, B. Com and B.Sc.

Year of Admission 2022

XECOE2 - HUMAN ASSIST DEVICES

Part A

1. **a)** Oxygenate the blood
2. **c)** End-stage heart failure
3. **d)** Bubble oxygenator
4. **b)** oxygenator
5. **c)** Total Artificial Heart (TAH)
6. **b)** Assist the heart in pumping blood moreeffectively
7. **a)** A non-invasive approach
8. **c)** improve blood flow to the heart muscle
9. b) White
10. a) An additional pumping chamber to the heart

Part B

11. How does a bubble oxygenator work?

A bubble oxygenator exposes blood to oxygen by bubbling a mixture of oxygen and other gases through it, facilitating gas exchange.

12. **Define artificial heart?**

An artificial heart is a prosthetic device designed to replace the function of a natural heart temporarily or permanently. It is used when a patient's heart is unable to pump blood effectively.

13. Write the mechanism of roller pump in H/L system?

Roller pumps can generate high pressures and are capable of providing both pulsatile and continuous flow, depending on the setup.

14. List the cardiac assist Devices (any two)

Left Ventricular Assist Device (LVAD)
Right Ventricular Assist Device (RVAD)
Biventricular Assist Device (BiVAD)
Total Artificial Heart (TAH)
Temporary Assist Devices

15. What is an auxiliary ventricle, and when is it used?

An auxiliary ventricle is an additional pumping chamber implanted to support the heart's function, often used in cases of severe heart failure.

Part C:

16.a.i: **Define a Heart-Lung Machine and explain about the functions of its components** (10)

Write about heart-lung machine – 2
Function explanation – 3
Explain at least 5 components – 5

16.a.ii: Explain the indications for a cardiac transplant in detail (5)

End-Stage Heart Failure
Cardiomyopathy
Coronary Artery Disease
Congenital Heart Defects
Valvular Heart Disease
Refractory Arrhythmias
Certain Inherited Heart Diseases
Any five with explanation - 5 marks

6.b.i: Explain the different types of oxygenators in H/L system. (10

Details about oxygenator facilitates ---- 5 marks
Types with explanation ------- 5marks
1. Bubble Oxygenators
2. Membrane Oxygenators
3. Hollow Fiber Oxygenators

16.b.ii. Which parameters are monitored during the cardiopulmonary bypass? (5)

1. Blood Pressure
2. Oxygenation and Gas Exchange
3. Temperature
4. Electrocardiogram (ECG)
5. Blood Flow and Pump Performance

with explanation ------- 5 marks

17.a.i: Discuss in details about Cardiac Assist Devices (10)

Left Ventricular Assist Device (LVAD)
Right Ventricular Assist Device (RVAD)
Biventricular Assist Device (BiVAD)
Total Artificial Heart (TAH)
Temporary Assist Devices
Explanation with each types - 10 marks

17.a.ii: How does an Intra-Aortic Balloon Pump (IABP) assist the heart's function? (5)

Key wors: improve coronary artery blood flow and overall cardiac function.
mechanical device used as a form of temporary circulatory support in patients with certain cardiac conditions ----- 5 marks

17.b.i: What is the significance of open chest and closed chest approaches in cardiac surgery? and write its Advantages and Disadvantages (10)

Explanation ---- 2
Advantages and Disadvantages of open chest approaches – 4
Advantages and Disadvantages of closed chest approaches – 4

17.b.ii: Outline the importance of auxiliary ventricles. (5)

Implantation
Function
Bridge to Transplant
Mechanical Support
Patient Selection
Complexity