

B.Tech/BCA /B. Com/ B. Sc DEGREE EXAMINATIONS, APRIL 2024
Continuous Internal Assessment II
Common to all Aerospace, Biotechnology, Mechanical, BCA, B. Com, B. Sc
Year of Admission: 2021&2022
XECO2 - Human Assist Devices

Time: 1½ Hours

Maximum Marks: 50

Instructions to the Candidates

Answer all the Questions

PART – A (10 x 1 = 10 Marks)

- | | | |
|-----|---|-----|
| 1. | c. Filtering excess fluids from the blood | CO3 |
| 2. | c. Chronic kidney disease | CO3 |
| 3. | c. fluid balance | CO3 |
| 4. | b. High-flux | CO3 |
| 5. | b. Dyspnea | CO4 |
| 6. | d. Nasal cavity | CO4 |
| 7. | c. Carbon dioxide | CO4 |
| 8. | b. Overinflation of the lungs | CO4 |
| 9. | c. Alarms for high and low pressures | CO4 |
| 10. | c. Tidal volume | CO4 |

PART – B (5 x 2 = 10 Marks)

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|-----|---|-----|
| 11. | Define artificial kidney. | CO3 |
| | An artificial kidney is a medical device designed to perform the functions of a human kidney, such as filtering waste products and excess fluids from the blood. | |
| 12. | Write the advantages of wearable artificial kidney. | CO3 |
| | Continuous or Frequent Therapy, Improved Quality of Life, Reduced Treatment Burden, Steady Clearance of Toxins | |
| 13. | What is the significance of an artificial kidney in treating kidney failure? | CO3 |
| | An artificial kidney provides a life-saving solution by performing vital kidney functions, thereby preventing the accumulation of toxins and maintaining proper fluid balance in the body. | |
| 14. | How does smoking affect the respiratory system? | CO4 |
| | Smoking can damage the respiratory system by causing chronic bronchitis, emphysema, and increasing the risk of lung cancer. It also impairs the cilia's function and reduces lung function. | |
| 15. | What is the role of the diaphragm in breathing? | CO4 |
| | The diaphragm is a muscle that contracts and flattens to create a vacuum in the chest cavity during inhalation, allowing air to enter the lungs. | |

PART – C (2 x 15 = 30 Marks)

- 16. a. i. Describe the functions of hemodialysis method and write the advantages and disadvantages. (10) CO3**
Explanation about hemodialysis ---- 4 marks
Advantages ----- 3 marks
Disadvantages ----- 3 marks
- ii. Explain the various types of membranes in the artificial kidney. (5) CO3**
Cellulose-Based Membranes
Synthetic Membranes
High-Flux Membranes
Low-Flux Membranes
Hemodiafiltration Membranes
High-Cut-Off Membranes
Polymethylmethacrylate (PMMA) Membranes
Any five types ----- 5 marks
- (OR)**
- b. i. Explain in detail about the dialysate and how it is supporting an artificial kidney. (10) CO3**
Explanation of Composition of Dialysate ----- 5marks
Explanation of Personalization of Dialysate ----- 5marks
- ii. Discuss about the working of wearable artificial kidney. (5) CO3**
Detailed explanation – 5marks
- 17. a. i. Explain in detail about the ventilator and its types. (10) CO4**
Volume-Cycled Ventilators
Pressure-Cycled Ventilators
Volume-Assured/Pressure-Controlled Ventilators
Bilevel Positive Airway Pressure (BiPAP) Machines
Adaptive Support Ventilation (ASV)
Explanation with all types – 10 marks
- ii. Summarize the external and internal respiration. (5) CO4**
About external respiration ---- 3marks
About internal respiration ----- 2 marks
- (OR)**
- b. i. Explain the features of intermittent positive pressure ventilation. (10) CO4**
Controlled Mode
Regular Intervals
Tidal Volume
Positive Pressure
Assistance or Control
Explanations ---- 10marks
- ii. Discuss about the functions of human respiration system. (5) CO4**
Explanation ---- 5 marks

Subject Code : XECO2

Subject Name : Human Assist Devices

No. of Pages : 2

Set No. : 1

➤ The Question paper has been set from the prescribed syllabus and it covers exhaustively.		
➤ Ensured that one set of question paper is specific, precise and without ambiguity.		
➤ Declared that I shall abide the guidelines, rules and regulations related to the confidential work assigned to me.		
	Name	Signature with date
Prepared and verified by the Course teacher	Mr. S. Arunmurugan	
Reviewed and Checked by Chairperson / QP Setting	Dr. C. Narmadha	

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Scrutinizer (/s) Remarks:

1.

2

Name	Signature with date

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Note : 1.This Page should be printed at separate page

2. Refer Sample of Question Paper