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Question Paper Code: UB703

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Professional Elective

Biomedical Engineering

21BMV703 CRITICAL CARE AND OPERATION THEATRE EQUIPMENT

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1. What is a suction apparatus, and what is its primary function in healthcare settings? CO1U
2. What is meant by the term 'Quantitative Ultrasound Bone Densitometer'? CO1 U
3. Identify and classify the significance of peristaltic pumps across different sectors CO1 U
4. List of various types of oxygen generators used in medical and industrial applications? CO1 U
5. How can we categorize the use of surgical microscopes in medical procedures? CO1 U
6. What is the technique employed in endoscopy CO1 U
7. What are the main components of a C-arm system used in medical imaging? CO1 U
8. Write the necessity of OT table CO1 U
9. Define IMCU in brief. CO1 U
10. What you mean by opto couplers. CO1 U

PART – B (5 x 16= 80Marks)

11. (a) (i) Explain the basic principles behind how automated drug delivery systems function to administer medications to patients. CO1 U (10)
(ii) Brief the key components of automated drug delivery system. CO1 U (6)

Or

- (b) (i) Analyze the advantages and limitations of DXA for assessing bone health or body composition in the ICU setting. CO1 U (10)
- (ii) List the importance of implantable infusion pump. CO1 U (6)
12. (a) Can you explain the basic principles underlying the operation of a heart-lung machine for supporting cardiopulmonary bypass during open-heart surgery? CO1 U (16)
- Or
- (b) Why is it important to maintain a sterile environment within an incubator for patient safety? Explain, CO1 U (16)
13. (a) Compare and contrast the impact of operating conditions on the efficiency and reliability of Pressure Swing Adsorption (PSA) and membrane separation oxygen generators. How do variations in temperature, pressure, and flow rate affect the performance of each type of generator? Provide specific examples. CO2 App (16)
- Or
- (b) How would you determine which approach to use for a patient recovering from surgery? Consider factors such as the patient's respiratory status, risk of aspiration, and tolerance for suctioning, as well as the surgical procedure and postoperative care plan CO2 App (16)
14. (a) Compare and contrast the advantages and limitations of fluoroscopy and digital subtraction angiography (DSA) in the context of their applications within a C-arm system. Analyze how each mode contributes to improving visualization, guiding interventions, and enhancing patient outcomes. CO1 U (16)
- Or
- (b) Analyze the advantages and disadvantages of centralized oxygen supply compared to decentralized or portable oxygen systems in healthcare settings CO1 U (16)

15. (a) Explain the potential consequences of each factor on patient safety and the functioning of medical equipment." CO1 U (16)

Or

(b) Analyze the impact of various factors, such as staffing levels, nurse-to-patient ratios, and availability of specialized equipment, on patient outcomes and recovery in the IMCU. Evaluate how variations in these factors can affect the quality of care provided and the likelihood of positive outcomes for patients." CO1 U (16)

