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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
 [AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
 Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 120022

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2024

Fifth Semester

Biomedical Engineering

U19BMV52 – CRITICAL CARE EQUIPMENT

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define Bone Mineral Density (BMD). Give its significance.	2	K1	CO1
2.	What is a suction apparatus used for?	2	K2	CO1
3.	Mention the primary function of a medical incubator.	2	K2	CO2
4.	Identify the functions of a hemodialysis machine.	2	K1	CO2
5.	What is a craniotomy, and why is it performed?	2	K2	CO3
6.	State the reason for instrument sterilization before and after surgery.	2	K2	CO3
7.	How does the operation theatre table contribute to patient safety during surgery?	2	K2	CO4
8.	Why is centralized air supply crucial in an operation theatre?	2	K2	CO4
9.	What is leakage current in medical devices?	2	K1	CO5
10.	How does an opto coupler work?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Illustrate and explain with necessary diagrams an automated insulin pump and mention some challenges associated with the implementation of the same.	13	K3	CO1
	(OR)			
b)	Explain the indications for initiating an ICU ventilator and mention some key parameters that need to be monitored.	13	K3	CO1
12. a)	Analyze how the selection of dialyzer size and type influence treatment parameters and patient comfort and overall treatment outcomes in hemodialysis.	13	K4	CO2
	(OR)			
b)	Analyze the role of defibrillators in the management of cardiac arrest. Discuss the potential complications and risk associated with defibrillator.	13	K4	CO2
13. a)	What does the Boyle's law apparatus do? Elaborate.	13	K1	CO3
	(OR)			
b)	Explain in detail on endoscopy.	13	K1	CO3
14. a)	What are the key factors to consider when designing a centralized air conditioning system for hospitals? Explain about them in detail.	13	K2	CO4
	(OR)			
b)	How do surgical lights minimize shadows during an operation? Outline the design requirements of surgical lights.	13	K2	CO4
15. a)	What are the hazards in a hospital setting, and what strategies can be employed to mitigate them? Discuss about them in detail.	13	K1	CO5
	(OR)			
b)	What are the key monitoring parameters for patients in an ICCU and IMCU, why are they important?	13	K1	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	John was brought to the hospital with chest pain and referred for a cardiac open heart surgery. Suggest the equipment that will aid to perform the surgery in a bloodless environment. Explain the essential components of the equipment with necessary block diagram.	15	K4	CO2
	(OR)			
b)	What are the key technical specifications to consider when selecting a C-arm for a medical facility? Explain in detail.	15	K3	CO4