


<p style="text-align: center;"><b>Tanta University</b>  <b>Faculty of Medicine</b>  <b>Anesthesia, SICU &amp; Pain</b>  <b>Medicine Dep.</b></p> <p>Date: 21 / 3 / 2021</p>	<p><b>Exam: MSc – 1<sup>st</sup> Part:</b></p> <p style="text-align: center;"><b>Physics &amp; Clinical Measurements</b></p> <p><b>No. of Questions: 3</b></p> <p><b>Times allowed: 3 hours</b></p> <p><b>Total marks: 45</b></p>	
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**Question 1:**

- a. Describe contents and function of closed anesthesia circuit (circle system)? (4marks)
- b. Demonstrate advantages and disadvantages of low flow breathing systems & what are the safe guards required when they are used? (4 marks)
- c. Discuss pumping effect in vaporizer and how it is avoided? (4marks)
- d. What are sources of errors in pulse oximeter reading? (3 marks)

**Question 2:**

- a. Draw, label and discuss normal capnogram & interpret abnormal curves during anesthesia? (4 marks)
- b. Describe methods, physical principles & sites for measuring body temperature? (4M)
- c. Identify factors contributing heat loss during surgery and its prevention? (4 marks)
- d. Explain venturi principle and its clinical application? (3 marks)

**Question 3:**

- a. Demonstrate measurement of intraoperative blood loss? (4 marks)
- b. Enumerate indications and complications of central venous line insertion? (4 marks)
- c. Discuss principles of different types of humidifiers? (4 marks)
- d. Define both critical temperature and specific heat? (3 marks)

-----GOOD LUCK-----

Master Degree

**All questions are to be answered, 15marks for each question**

1. Discuss types ,mechanism of action , indications and  
contraindications of electro-analgesia
2. Give an account on:
  - a. Galvanic current
  - b. Different mechanism of Laser therapy in pain management
3. Discuss methods of transmission of heat with enumeration of  
example for each method.

*Best wishes.*