



(University of Choice)
**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

THIRD YEAR, SECOND TRIMESTER EXAMINATION

**FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN PHYSIOTHERAPY (UPGRADING AND DIRECT)
MAIN**

COURSE CODE: BSP 326/ HPT 221

COURSE TITLE: CARDIORESPIRATORY IN PHYSIOTHERAPY II

DATE: MONDAY 17TH APRIL 2023

TIME: 8:00-10:00 AM

INSTRUCTIONS TO CANDIDATES

Answer All Questions

Section A: Multiple Choice Questions (MCQ)	20 Marks.
Section B: Short Answer Questions (SAQ)	40 Marks.
Section C: Long Answer Question (LAQ)	40 Marks

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This paper has 7 pages

SECTION A: MULTIPLE CHOICE QUESTIONS (MCQ) 20 MARKS

1. One of the following modes of ventilation “locks out” the patient's efforts to breathe.
 - A. Controlled Mandatory Ventilation
 - B. Synchronous Intermittent Mandatory Ventilation
 - C. Assist Control Mode
 - D. Pressure Control Mode
2. One of the following modes of ventilation has the risk of the patient getting respiratory alkalosis.
 - A. Controlled Mandatory Ventilation
 - B. Synchronous Intermittent Mandatory Ventilation
 - C. Assist Control Mode
 - D. Pressure Control Mode
3. The mode of ventilation which allows the patient to breathe spontaneously at his or her own respiratory rate and depth between the ventilator breaths is...
 - A. Controlled Mandatory Ventilation
 - B. Synchronous Intermittent Mandatory Ventilation
 - C. Assist Control Mode
 - D. Pressure Control Mode
4. Once mechanical ventilation is established, which of the following suggests that an intraluminal mass or bronchospasm is present?
 - A. Elevated resistive pressure
 - B. High minute ventilation
 - C. Inappropriate tidal volume for the lung
 - D. Increased elastic pressure
5. Which of the following is the simplest and most effective means of providing full mechanical ventilation?
 - A. Pressure control ventilation
 - B. Pressure support ventilation
 - C. Synchronized intermittent mandatory ventilation
 - D. Volume-control ventilation

6. If acute hypotension develops in a mechanically ventilated patient, which of the following should be considered?
- A. Oxygen toxicity
 - B. Tension pneumothorax
 - C. Venous thromboembolic disease
 - D. Ventilator-associated pneumonia
7. You are looking after a 75-year-old man who was admitted 3 days previously with an anterior ST- Elevation Myocardial Infarction and underwent primary Percutaneous coronary intervention to his left anterior descending artery. He has made a good recovery and his echocardiogram shows that he has only mild left ventricle impairment. He is asking about safe levels of physical activity once he goes home. What should you advise him?
- A. To return immediately to his previous (pre-admission) level of activity
 - B. That exercise is dangerous after a heart attack and he should continue with at least 2 weeks of bed rest after he returns home
 - C. That he should be physically active for 20–30 minutes a day to the point of slight breathlessness
 - D. That he should undertake a 30-minute warm up period prior to any exercise
 - E. That he should start with at least 20–60 minutes of moderate aerobic exercise, three to five times a week
8. One of your patients is about to be discharged following an They ask A Non-ST- Elevation Myocardial Infarction. They ask you for some dietary advice to help to try and reduce their risk of having a further heart attack. What advice should you give?
- A. To eat a Mediterranean-style diet with less meat and more bread, fruit, vegetables, and fish, and to replace butter and cheese with products based on vegetable and plant oils
 - B. To read food labels when shopping to ensure that they reduce the amount of mono-unsaturated fats in their diet and eat more foods containing saturated fats
 - C. To eat at least 1 g of omega-3 fatty acids, which are contained in oily fish, every week

- D. To take supplements containing beta-carotene, antioxidant supplements, (vitamin E and/ or C), or folic acid to reduce cardiovascular risk
9. You are reviewing a 60-year-old patient in clinic after a recent NSTEMI. They have not yet completed their cardiac rehabilitation programme and are asking for advice about ongoing physical activity. They have been looking online and have come across articles that say they should exercise at about 6 'METs'. They ask you to explain what a MET is and if it means that they have to jog to keep healthy.
- A. 1 MET, or metabolic equivalent of task, is equivalent to the resting metabolic rate when sitting quietly, and has a conventional reference value of 3.5 mL O₂/kg/min which is equal to 1 kcal/kg/h
 - B. 1 MET, or metabolic equivalent of task, is equivalent to the resting metabolic rate when sleeping, and has a conventional reference value of 3.5 ml O₂/kg/min which is equal to 1 kcal/kg/h
 - C. 1 MET, or metabolic equivalent of task, is equivalent to the resting metabolic rate when sitting quietly, and has a conventional reference value of 6.5 mL O₂/kg/min which is equal to 1 kcal/kg/h
 - D. 1 MET, or metabolic equivalent of task, is equivalent to the resting metabolic rate when sleeping, and has a conventional reference value of 6.5 mL O₂/kg/min which is equal to 1 kcal/kg/h
10. Whilst you are working in your local cardiology ward, one of the nursing staff approaches you and asks, in general, which patients are very high risk and will need specialist assessment prior to referral for the exercise component of your local cardiac rehabilitation (CR) programme. Which one of the following statements is correct?
- A. Patients with cyanotic congenital heart disease or those who have received an implantable cardiac defibrillator should never be referred for cardiac rehabilitation
 - B. Patients with decompensated heart failure should be encouraged to exercise if it is part of a cardiac rehabilitation programme
 - C. Patients with severe valvular stenoses can take part in exercise programmes whilst awaiting valve replacement surgery

- D. Patients with angina or breathlessness occurring at a low level of exercise (e.g. inability to complete the first 4 minutes of the shuttle walking test) should participate in exercise sessions based in a safe environment with access to a defibrillator and staff trained in advanced life support
11. Which of the following statements is TRUE regarding sternal precautions after Open Heart surgery
- A. There should be no lifting, pushing or pulling greater than 15lbs
 - B. There should be no lifting, pushing or pulling less than 5lbs
 - C. There should be no lifting, pushing or pulling greater than 10lbs
 - D. Lifting is okay but pushing or pulling is contraindicated
12. In phase 1 cardiac rehab, there should follow this philosophy: ____ weight and ____ repetitions
- A. Low / low
 - B. Low / high
 - C. High / high
 - D. High / low
13. According to the Borg's Rate of Perceived Exertion Scale, what should be the goal in rehab?
- A. 17-19
 - B. 11-13
 - C. 14-16
 - D. 8-10
14. Your pt. is in phase 1 of cardiac rehab. The intensity of his activities should stay in the _____ METS range.
- A. 1-4
 - B. 1-5
 - C. 1-3
 - D. 1-2
15. The goal of treatment in a cardiopulmonary rehab program is: _____ stroke volume and _____ heart rate for same amount of work.
- A. Decreased, decreased

- B. Increased, decreased
 - C. Decreased, increased
 - D. Increased, increased
16. The phase 2 of cardiac rehabilitation is
- A. Community based
 - B. In patient rehabilitation
 - C. Out patient rehabilitation
 - D. A and B
17. A patient is receiving positive pressure mechanical ventilation and has a chest tube. When assessing the water seal chamber what do you expect to find?
- A. The water in the chamber will increase during inspiration and decrease during expiration.
 - B. There will be continuous bubbling noted in the chamber.
 - C. The water in the chamber will decrease during inspiration and increase during expiration.
 - D. The water in the chamber will not move.
18. A patient with a chest tube has no fluctuation of water in the water seal chamber. What could be the cause of this?
- A. This is an expected finding.
 - B. The lung may have re-expanded or there is a kink in the system.
 - C. The system is broken and needs to be replaced.
 - D. There is an air leak in the tubing.
19. A patient is recovering from a pneumothorax and has a chest tube present. Which of the following is an appropriate finding when assessing the chest tube drainage system?
- A. Intermittent bubbling may be noted in the water seal chamber.
 - B. 200cc of drainage per hour is expected during recovery of a pneumothorax.
 - C. The chest tube is positioned at the patient's chest level to facilitate drainage.
 - D. All of these options are appropriate findings.
20. Mechanical ventilation
- A. Is used more often for type 1 than type 2 respiratory failure
 - B. Will always be needed for a patient with a cervical cord transection at c7

- C. In non-surgical patients is increasingly being carried out using non-invasive techniques
- D. Is relatively free from complications.

SECTION B: SHORT ANSWER QUESTIONS (SAQ)**40 MARKS****ANSWER ALL QUESTIONS. Each question is 5 marks**

- 1) You are working with a 54-year-old pt. who has just undergone a cardiac transplant. What should his target heart rate be (assuming you want it to be 70% of his max. heart rate)?
(Show your working) (5 marks)
- 2) State the disadvantages of pressure limited ventilation (5 marks).
- 3) State the respiratory complications of mechanical ventilation (5 marks).
- 4) State the disadvantages of PEEP in paediatric mechanical ventilation (5 marks).
- 5) State the possible causes of low-pressure alarm signal and the possible action for each cause (5 marks).
- 6) Describe characteristics of an infant's pulmonary anatomy that contribute to the increased work of breathing and to the potential for pulmonary distress in this age group (5 marks).
- 7) Describe the general goals and principles of cardiopulmonary physical therapy in the intensive care unit (5 marks).
- 8) The criteria for diagnosis for ARDS has been recently updated and is now termed the 'Berlin definition. State the criteria for Berlin definition (5 marks)

SECTION C: LONG ANSWER QUESTIONS (LAQS)**40 MARKS****ANSWER ALL QUESTIONS EACH ONE IS 20 MARKS**

Describe the phases of cardiac rehabilitation after Open Heart Surgery and the precautions to be taken (20 marks)

Physiotherapists play an important role in pulmonary rehabilitation. Discuss the components of exercise prescription during pulmonary rehabilitation (20 marks)