

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR**

**THIRD YEAR, FIRST TRIMESTER EXAMINATIONS
FOR THE DEGREE
OF**

BACHELOR OF SCIENCE IN PHYSIOTHERAPY

COURSE CODE: BSP 317

**COURSE TITLE: CARDIORESPIRATORY AND GENERAL
PHYSIOTHERAPY I**

DATE: ----- TIME: -----

INSTRUCTIONS TO CANDIDATES

Answer all Questions

Sec A: Multiple Choice Questions (MCQ) 20 Marks

Sec B: Short Answer Questions (SAQ) (40 marks)

Sec C : Long Answer Questions (LAQ) (40 marks)

TIME: 3 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over.



SECTION A: MULTIPLE CHOICE QUESTIONS

(20 marks)

- 43) The first heart sound occurs during the period of?
a. Isometric relaxation

- b. Isotonic relaxation
 - c. Isovolumetric contraction**
 - d. Isovolumetric relaxation
- 44) The PR interval of ECG corresponds to?
- a. Ventricular repolarization
 - b. Atrial repolarization and conduction through AV node**
 - c. Ventricular depolarization
 - d. Repolarization of AV node and bundle of His
- 45) Which of the following is not increased during exercise
- a. Stroke volume
 - b. Systolic BP
 - c. Heart rate
 - d. Total peripheral resistance**
- 46) The most important gas maintaining alveolar ventilation?
- a. Nitrogen
 - b. Hydrogen
 - c. Oxygen
 - d. Carbon dioxide**
- 47) Which is not a complication of suctioning?
- a. Cough**
 - b. Vagal stimulation
 - c. Hypotension
 - d. Atelectasis
- 48) Which is not an inotropic drug?
- a. Digoxin
 - b. Dobutamin
 - c. Enoxiumon
 - d. Furosemide**
- 49) The recommended frequency of performing incentive spirometer is?
- a. 4 times/day
 - b. 5 times/hr while awake
 - c. 10 time/day
 - d. 10 times/hour while awake**
- 50) For humidification which is the most important concept?
- a. Absolute humidity
 - b. Vapour pressure
 - c. Relative humidity**
 - d. Body humidity
- 51) Which of the following is not a self-drainage procedure?
- a. Forced Expiratory Technique
 - b. Active Cycle of Breathing Technique**
 - c. Autogenic Drainage
 - d. Prone on elbow
- 52) Flutter is a?
- a. High frequency PEP device**
 - b. Chest compressor
 - c. Vibrator
 - d. None of the above
- 53) Pressure at the umbilicus by heel of the palm is?
- a. Helmich type assist**
 - b. Costophrenic assist
 - c. Anterior chest compression assist

- d. None of the above
- 54) PaCo₂ is?
- Directly proportional to ventilation
 - Inversely proportional to ventilation**
 - Directly proportional to blood pH
 - Inversely proportional to blood pH
- 55) Which is not true for percussion?
- It is done with fingers and thumb adducted
 - The sound of percussion should be a hollow sound
 - The rate of percussion should be between 100-475 times per minute
 - The dominant hand pressure is more than the non-dominant hand**
- 56) Which is not a feature of decreased oxygenation?
- Bradypnea**
 - Tachypnea
 - Tachycardia
 - Clubbing
- 57) The cause of bronchial breath sound is?
- Narrowing of airway
 - Attenuation of breath sound
 - Pleural effusion
 - Bronchial asthma**
- 58) Leucocytes involved in anaphylactic hypersensitivity and inflammatory reaction?
- Basophiles**
 - Monocytes
 - Lymphocytes
 - Neutrophils
- 59) Normal plasma Prothrombin time (PT)
- 36-50 sec
 - 8-10sec**
 - 13-20sec
 - 20-30sec
- 60) Biochemistry tests are not done in sample obtained from?
- Urine
 - Whole blood
 - Serum
 - Stool**
- 61) The normal range for HDL is?
- 45-70mg/dl**
 - 70 – 100 mg/dl
 - 100-150 mg/dl
 - 150-200 mg/dl
- 62) Forced expiratory flow (FEF) is the flow of air coming out of the lung during the middle portion of a forced inspiration
- True
 - False**

SECTION B: SHORT ANSWER QUESTIONS

(40 MARKS)

- 16) Name and describe 8 anatomical differences between the adult and pediatric respiratory system. (8 marks)
- The chest or thorax**
 - Shape – child cylindrical

- Rib cage – soft and cartilaginous
 - Mechanism of breathing – bucket handle movement is seen in older children and adults
- ii. Breathing pattern – limited chest expansion- can only increase respiratory rate
 - iii. Diaphragm – diaphragmatic breathers
 - iv. Internal organs – heart other organs large
 - v. Airway diameter - small
 - vi. Bronchial walls – short and narrow hence more respiratory resistance, less cartilaginous in walls
 - vii. Surfactant – insufficient
 - viii. Alveoli – very few and small
 - ix. Collateral ventilation – poorly developed in children
 - x. Exposure to toxins and allergens – children are small and short hence come into contact with pollutants
 - xi.
- 17) What do the following pressure modes mean (8 marks)
- i. Pressure Controlled ventilation (PCV) – allows pressure ventilator pressure to be controlled throughout the cycle in order to generate the pressure necessary to expand the collapsed alveoli
 - ii. Pressure-support ventilation (PSV) - pressure support, is a spontaneous mode of ventilation. The patient initiates every breath and the ventilator delivers support with the preset pressure value. With support from the ventilator, the patient also regulates his own respiratory rate and tidal volume.
 - iii. Continuous positive airway pressure (CPAP) - is a form of positive airway pressure ventilator, which applies mild air pressure on a continuous basis to keep the airways continuously open in people who are able to breathe spontaneously on their own, but need help keeping the airway open.
 - iv. Positive end expiratory pressure (PEEP) -is the pressure in the lungs (alveolar pressure) above atmospheric pressure (the pressure outside of the body) that exists at the end of expiration.
- 18) Enumerate 8 abnormal types of breathing patterns (8 marks)
- i. Apnea
 - ii. Tachypnea
 - iii. Bradypnea
 - iv. Hyperventilation
 - v. Kussmaul breathing
 - vi. Cheyne-stokes breathing
 - vii. Biot's/ataxic breathing
 - viii. Sighing breathing
 - ix. Obstructive breathing
 - x. Agonal breathing
- 19) Why are PA chest x-rays preferred over AP chest x-ray? (8 marks)
- i. Reduces magnification of the heart therefore preventing appearance of cardiomegaly
 - ii. Reduces radiation dose to radiation sensitive organs e.g thyroid, eyes and breasts
 - iii. Visualized maximum areas of lung
 - iv. Moves scapula away from the lung fields
 - v. More stable for the patient as they can hold onto the unit – reducing patient movement
 - vi. Compression of breast tissue against the film cassette reduces the density of tissue around CP bases therefore visualizing them more clearly
- 20) Describe the principles of humidifier function

- i. **Temperature** – as the temperature of gas increases its ability to hold water vapour (capacity) increases and vice versa
- ii. **Surface area** – there is more opportunity for evaporation to occur with greater surface area of contact between water and gas
- iii. **Time of contact** – there is greater opportunity for evaporation to occur, the longer a gas remains in contact with water
- iv. **Thermal mass** – the higher the mass of water or core element of a humidifier the higher its capacity to transfer of hold heat

SECTION C: LONG ANSWER QUESTIONS (40 marks)

- 5) You meet Mr. Hamisi Bote an elderly gentleman who has been put on oxygen therapy.
- i. What is the indications for O₂ therapy (4 mark) –
 - i. **Hypoxia - normoxic hypoxia**
 - ii. **hypoxemia,**
 - iii. **severe trauma**
 - iv. **short term therapy e.g carbon monoxide poisoning**
 - v. **surgical intervention e.g post anesthesia recovery**
 - vi. **trapped gases -pneumothorax absorption**
 - ii. Differentiate the types of hypoxia (4 marks) –
 - i. **Hypoxic**
 - ii. **Stagnant**
 - iii. **Anemic**
 - iv. **hystotoxic,**
 - iii. Highlight the ways you could administer the oxygen therapy (8 marks)
 - i. **Low flow systems - contribute partially to inspired gas client breathes**
 1. **nasal cannula**
 2. **nasal catheter**
 3. **face mask**
 4. **non-re breather mask**
 5. **Partial rebreather mask**
 - ii. **High flow systems - deliver specific and constant percent of oxygen independent of client's breathing**
 1. **Venturi mask**
 2. **Trach collar**
 3. **T-piece**
 - iii.
 - iv. What are the possible hazards (4 marks)
 - i. **Drying of mucous membrane**
 - ii. **Depression of ventilation in COPD**
 - iii. **Reversal of compensatory hypoxic vasoconstriction**
 - iv. **Atelectasis due to absorption collapse**
 - v. **Oxygen toxicity**

vi. Retinopathy of prematurity
vii. Oxidative stress

- 6) You are required to perform postural drainage to a patient with pneumonia affecting all lung fields. Using your knowledge of anatomy describe the positions you would take to clear all the lobes of the lungs effectively.

