



University of Fort Hare  
*Together in Excellence*

**SUPPLEMENTARY EXAM**  
**CLINICAL PHYSIOLOGY IN WORK ENVIRONMENT**  
**(HUS327)**

<b>PROGRAMME:</b>	Bachelor of Health Science in Human Movement Science
<b>DATE:</b>	November 2024
<b>EXAMINER:</b>	Ms S. Skeyi
<b>INTERNAL MODERATOR:</b>	Mrs X Muller
<b>EXTERNAL MODERATOR</b>	Dr Nicola du Preez
<b>DURATION:</b>	3 hours
<b>MARKS:</b>	100

**INSTRUCTIONS:**  
Answer all the questions in Sections A and B.

**SECTION A****[20]****QUESTION 1****{10}**

Make use of Column A and B. Match the correct physiological term in Column A to the function/definition in Column B. Write only your answer in the answer book that is provided, e.g. 1.1 E.

COLUMN A	COLUMN B	
1.1 Anaemia	A	Respect for individual differences, and responsibility to all stakeholders.
1.2 HF/E Principles	B	A condition that develops when your blood lacks enough healthy red blood cells or haemoglobin.
1.3 Myocardial infarction	C	Occurs when there's a marked reduction in the number of stem cells or absence of these cells.
1.4 Pharynx	D	Transports oxygenated blood to the rest of the body
1.5 Aplastic Anaemia	E	Sit-Stand workstations.
1.6 Left Ventricle	F	Conditions that occur when there are low levels of clotting factors in your blood.
1.7 Steady-state exercise	G	Occurs when the part of the heart muscle suddenly loses its blood supply resulting to a permanent cellular injury and necrosis after a prolonged ischaemic episode.
1.8 Ergonomic Intervention	H	Opening for both food and air.
1.9 Aorta	I	Constant submaximal activity profile e,g distance running.
1.10 Haemophilia A and B	J	Pumps blood to the rest of the body.

**QUESTION 2****{10}**

Indicate whether the following statements are true or false. Provide the correct answer if the statement is false. If no reason is provided, no marks will be allocated

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- 2.1 Ultra-endurance training is any exercise lasting 3 hours.
- 2.2 The Atrio-ventricular node slows down the action potential.
- 2.3 Intermittent exercise is an activity profile that is predictable.
- 2.4 The heart pumps 5 liters of blood per minute.
- 2.5 Cardiovascular diseases are the diseases that involve the heart or blood.
- 2.6 Oxygen combines with haemoglobin within the white blood cells.

2.7 Carbon dioxide is released into the blood during gas exchange in the lungs.

**SECTION B** **[80]**

**QUESTION 3** **{20}**

John, a 55-year-old male, presents with a family history of cardiovascular disease, smokes 10 cigarettes per day, has a blood pressure of 140/90 mmHg, experiences leg pain and reduced blood flow to the arms and legs and has a body mass index (BMI) of 30.

3.1 Name the cardiovascular diseases he suffers from and its cause. **{5}**

3.2 Discuss John's cardiovascular disease risk factors and explain how they contribute to his increased risk of developing cardiovascular disease. **{15}**

**QUESTION 4** **{10}**

John, a 25-year-old athlete, is preparing for a marathon. During his intense training session, his heart rate increases from 60 beats per minute (bpm) at rest to 180 bpm.

Explain the effects of exercise on heart rate and blood distribution within John's body.

**QUESTION 5** **{15}**

5. Sarah is a receptionist and spends most of her day in front of her computer doing administrative work.

5.1 Define Ergonomics **[5]**

5.2 Briefly discuss the impact Sarahs' job can have on her cardiovascular health and propose 2 intervention strategies that the company can implement to reduce these health risks. **[10]**

**QUESTION 6** **{25}**

The following data (Table 1) was obtained during a laboratory exercise where you exercised your classmates on a cycle ergometer.

**Table I: Systolic and Diastolic Blood Pressure responses**

Time (Minutes)	Blood Pressure (mmHg)		
	Participant 1	Participant 2	Participant 3
1	120/80	112/62	121/80
2	126/82	118/60	123/77
3	130/80	118/62	131/77
4	128/79	120/59	130/80
5	129/81	120/60	131/80
6	128/77	119/61	129/80

Using this data:

- (a) Calculate the mean and standard deviation for both systolic and diastolic blood pressure for each minute (using data provided from all three participants) from minutes 1-6. (12)
- (b) Using the data from (a), draw a clearly annotated graph showing these responses over the 6-minute period. (5)
- (c) Comment on the pattern of the blood pressure response and discuss the type of exercise they were likely doing and why you believe this to be the case. (8)

**QUESTION 7****{15}**

Discuss the impact of endurance training on heart rate, stroke volume and cardiac output at rest and during exercise.

**TOTAL: 100 Marks**