



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF ENGINEERING**

**InSTEM**

<b>QUALIFICATION: INTRODUCTION TO SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS</b>	
<b>QUALIFICATION CODE:</b> 04STEM	<b>LEVEL:</b> 4
<b>COURSE CODE:</b> IBL402S	<b>COURSE NAME:</b> INTRODUCTION TO BIOLOGY
<b>SESSION:</b> NOVEMBER 2019	<b>PAPER:</b> N/A
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

<b>FIRST OPPORTUNITY EXAMINATION QUESTION PAPER</b>	
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<b>MODERATOR:</b>	Mr Petrus Paulus

<b>INSTRUCTIONS</b>	
1.	The number of marks is given in brackets at the end of each questions or part question.
2.	Answer all the questions.
3.	Please write neatly and legibly.
4.	Mark all answer clearly with their respective numbers.
5.	Use the graph paper provided for Question 6.

**PERMISSIBLE MATERIALS**

1. Calculator and stationery.

**THIS QUESTION PAPER CONSISTS OF 6 PAGES (Excluding this front page)**

## Section A

### Question 1: Multiple choice question.

[16]

Evaluate the statements in each numbered section select the most appropriate answer or phrase from the given possibilities. Fill in the appropriate letter next to the number of the correct statement/phrase in the ANSWER SHEET provided.

- 1.1 At rest, you probably take about 12 breaths per minute, each one moving about  $0.5 \text{ dm}^3$  of air into and out of your lungs, resulting in  $6 \text{ dm}^3$  of air into and out of your lungs each minute, this is your..... (1)
- A Voluntary control
  - B Rhythmic breathing
  - C Ventilation rate
  - D Involuntary rate
- 1.2 Within minutes of Asthma attack one of the following will NOT happen: (1)
- A Blood vessels in the wall of the air contract (Vasconstriction)
  - B Extra mucus is produced
  - C Blood vessels in the wall of the airways dilate ( Vasodilation).
  - D Blockage of the airways
- 1.3 In the complementary base pairs of a DNA , Thymine readily pair up with ..... (1)
- A Guanine
  - B Cytosine
  - C Uracil
  - D Adenine
- 1.4 Water behaves very oddly between  $0 \text{ }^\circ\text{C}$  and  $4 \text{ }^\circ\text{C}$  as seen in ponds and during winter. Identify a false statement in these facts below: (1)
- A Density increases as the temperature rises.
  - B The Maximum Density of water is not at  $0 \text{ }^\circ\text{C}$  but at  $4 \text{ }^\circ\text{C}$
  - C Water at the bottom of the pond stays at  $4 \text{ }^\circ\text{C}$
  - D Heat is rapidly lost to the environment of ice from the bottom of the pond.

- 1.5 Which of the following is false about a high latent heat of Vaporization? (1)
- A At low temperatures water molecules can escape into the atmosphere.
  - B At 100 °C with sufficient kinetic energy, water molecules escape.
  - C Much energy is needed to break the hydrogen bonds.
  - D Low energy is needed to break the hydrogen bonds.
- 1.6 Which of the following are PENTOSEs? (1)
- A Glucose and fructose
  - B Fructose and galactose
  - C Ribose and deoxyribose
  - D Maltose and Cellobiose
- 1.7 The ring form of Monosaccharide are..... (1)
- A Starch and glycogen
  - B Beta glucose and Starch
  - C Alpha glucose and Gamma glucose
  - D Alpha glucose and Beta glucose
- 1.8 Which of the following is NOT true about MITOSIS? (1)
- A Two divisions resulting in four daughter cells.
  - B haploid and diploid cells may divide by mitosis
  - C Individual Chromosomes are arranged on the equator of the spindle.
  - D Daughter cells are genetically identical with each other, and with the parent cell.
- 1.9 Which of the following is NOT true about MEIOSIS? (1)
- A Daughter cells are genetically different.
  - B Daughter cells are genetically identical
  - C Daughter cells have half chromosomes numbers.
  - D In Meiosis I, the chromatids stay joined and the homologous chromosomes separate.

- 1.10 Which of the following is NOT true about Protein Synthesis? (1)
- A Direction of replication is NOT important.
  - B One DNA molecule contains enough instructions for making many proteins.
  - C DNA contains a code which dictates the sequence in which amino acids are to be linked together to make a protein.
  - D The sequence of bases in a gene is a code for the sequence of amino acids in a protein.
- 1.11 Vitamin B12 (riboflavin ) is present in all these except..... (1)
- A Eggs
  - B Citrus fruits
  - C Milk
  - D Yeast
- 1.12 The role of Phosphate,  $PO_4^{3-}$  is to help in..... (1)
- A bone formation
  - B formation of thyroxine
  - C thymine formation
  - D Coenzyme NAD formation
- 1.13 Iron ( $Fe^{2+}$ ) carry out all functions except..... (1)
- A formation of transmission signals across synapses
  - B formation of haemoglobin
  - C formation of myoglobin
  - D formation of cytochrome oxidase (an enzyme in the electron chain)
- 1.14 All the following are functions of Calcium  $Ca^{2+}$  in the body except..... (1)
- A Transmission of signals across synapses.
  - B Formation of bones, blood clotting.
  - C Transmission of electron transport chains.
  - D Muscle contraction.

1.15 Retinol (Vitamin A) is responsible for ..... (1)

- A formation of co-enzyme A
- B formation of rhodopsin, the light sensitive pigment in rod cells.
- C formation of TPP, which is coenzyme.
- D formation of FAD , a coenzyme required in respiration.

1.16 Iodine is found in all these except ..... (1)

- A oily fish
- B drinking water
- C iodised Salt
- D sea food

**SECTION B**  
**ANSWER ALL QUESTIONS**

**Question 2** [21]

- 2.1 To which kingdom do the following organisms belong: moulds, toadstools, mushrooms, yeast, puffballs. (1)
- 2.2 Make a large labelled diagram of the mould found on bread *Rhizopus nigricans*. (11)
- 2.3 List the main features of this Kingdom and state why they are successful. (9)

**Question 3** [20]

- 3.1 Explain the light reaction or dark reaction in photosynthesis. (14)
- 3.2 What are plastids? (6)

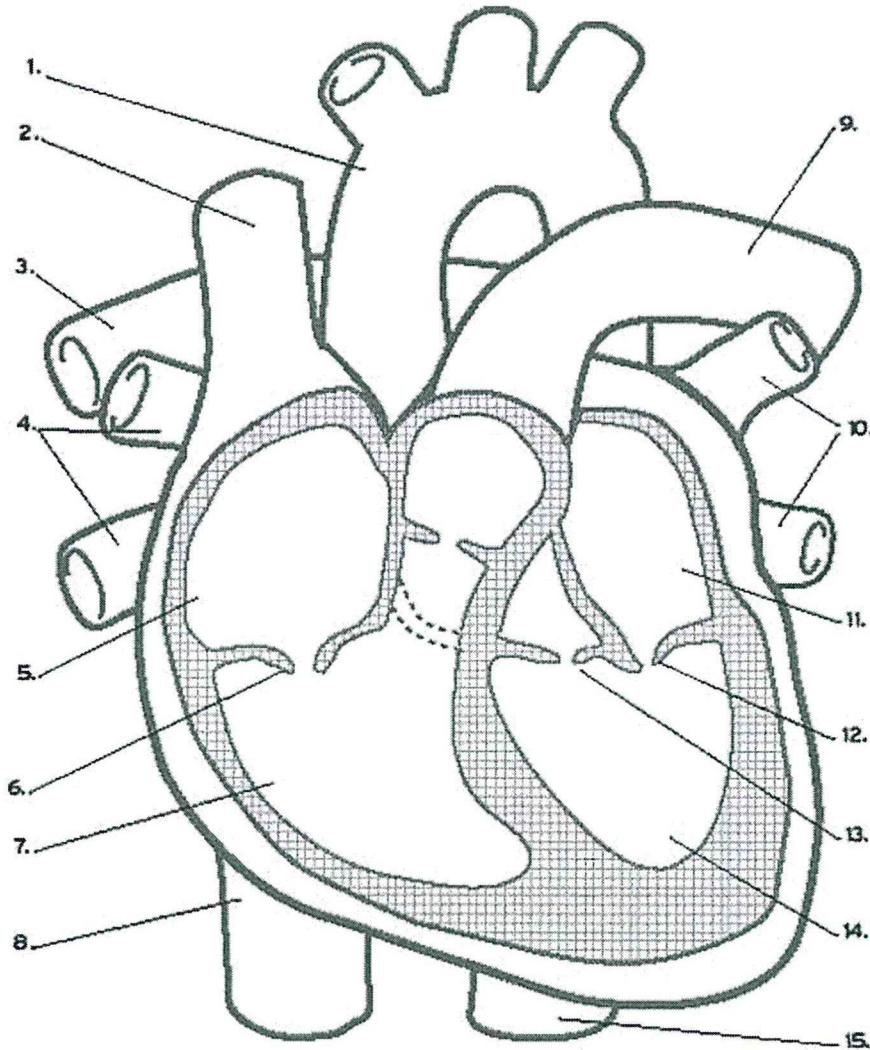


Question 4

[17]

4.1 Label any ten (10) parts of the provided diagram below:

(5)



4.2 List the composition of blood. (5)

4.3.1 What makes Haemoglobin functional? (2)

4.3.2 Explain the biological significance of Haemoglobin, a diagram will be necessary. (5)

**Question 5**

**[10]**

Differentiate between intraspecific and interspecific competition.

**Question 6**

**[16]**

Using the data below, construct a bar-chart:

The following is an Estimate Population of Swine flu in hospitals in Namibia.  
Treated cases verses Death.

HOSPITAL	T (TREATED)	D(DEATH)
P	33	3
Q	40	1
R	22	0
Z	50	5

**END OF EXAM**