



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: VARIOUS	
QUALIFICATION CODE: VARIOUS	LEVEL: 4
COURSE CODE: BSC410S	COURSE NAME: BASIC SCIENCE
SESSION: JULY 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION PAPER	
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MODERATOR:	PROF HABAUKA KWAAMBWA

INSTRUCTIONS	
1.	Write all your answers in the answer booklet provided, using black/blue ink pen only.
2.	Read the whole question before answering.
3.	Begin each question on a new page.
4.	The Periodic Table is attached at the back of this question paper.

PERMISSIBLE MATERIALS

Scientific Calculator

THIS QUESTION PAPER CONSISTS OF 13 PAGES
(INCLUDING THIS FRONT PAGE AND PERIODIC TABLE)

SECTION A: BIOLOGY

[35]

QUESTION 1:

[20]

Multiple choice questions

Each question weighs 2 marks each.

1.1 The basic structural and functional unit of all living organisms is called _____. (2)

- A. a cell
- B. an organ
- C. a protein
- D. an organic system

1.2 The scientific study of naming, describing and classifying organisms is called _____. (2)

- A. Taxonomy
- B. Classification
- C. Binomial nomenclature
- D. Ecology

1.3 A plants that have separate male and female flowers on the same plant are called _____. (2)

- A. Dioecious plants
- B. Monoecious plants
- C. Perfect plants
- D. Gymnosperm plants

1.4 An ecosystem is defined as _____. (2)

- A. The study of all living organisms
- B. The Study of all non-living organisms
- C. The study of energy production in the environment
- D. The interaction of living organisms and their abiotic component in the environment.

1.5 A relationship in which two organisms both benefit is called _____. (2)

- A. predation
- B. commensalism
- C. mutualism
- D. parasitism

1.6 In infants, a diet lacking Vitamin D and calcium can be linked to which of the following? (2)

- A. rickets
- B. scurvy
- C. osteoporosis
- D. cardiovascular disease

1.7 The vitamin that is called the "clot master" _____? (2)

- A. Vitamin B
- B. Vitamin C
- C. Vitamin K
- D. Vitamin E

1.8 Which is of the following vitamins requires daily intake? (2)

- A. Vitamin A
- B. Vitamin D
- C. Vitamin K
- D. Vitamin C

1.9. The process by which pathogenic and all unwanted microorganisms are killed from the milk is called _____ (2)

- A. Fermentation
- B. Elimination
- C. Pasteurization
- D. Decomposition

1.10 A fuel gas produced by anaerobic fermentation from the waste yields _____. (2)

- A. Carbon dioxide
- B. Oxygen
- C. Methane
- D. Bagasse

QUESTION 2 Structured questions

[15]

2.1 Given the following information on the classification of the African elephant, write down its scientific name? (2)

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Proboscidea
Family: Elephantidae
Genus: Loxodonta
Species: Africana

2.2 Discuss why producers and decomposers are indispensable in the smooth functioning of the ecosystem. (2)

2.3 Briefly explain three factors that cause organisms to become endangered or extinct. (3)

2.4 What is the role of vitamin D in the formation of bones? (2)

2.5 Discuss the three effects of a diet that is in deficiency of proteins? (3)

2.6 Explain the role of fermentation in bread making. (2)

2.7. What gives yoghurt its slightly sour tastes? (1)

SECTION B: CHEMISTRY

[35]

QUESTION 3:

[20]

Question Type: Multiple Choices. Choose and write a letter corresponding to the correct answer. Each correct answer carries **2 marks**.

3.1 A process which involves the output of energy or release of heat is called? (2)

- A. Exothermic
- B. Dissolving
- C. Endothermic
- D. Thermodynamic

3.2 Hydrogen is an example of a sample of matter classified as; (2)

- A. Compound
- B. Homogeneous mixture
- C. Heterogeneous mixture
- D. Element

3.3 In relation to composition, a saturated solution contains (2)

- A. A lot of solute in a given amount of solvent
- B. More solvent in a given amount of solute
- C. As much solute as the given amount of solvent
- D. None of the above

3.4 The two phase changes involved in simple distillation are; (2)

- A. Evaporation and condensation
- B. Evaporation and deposition
- C. Evaporation and sublimation
- D. Evaporation and melting

3.5 The weather forecast for Tuesday was estimated to be 28.4°C . What reading would this temperature give in degrees Fahrenheit? (2)

- A. 543.2°F
- B. 83.12°F
- C. 83.1°F
- D. 543°F

3.6 SI unit for temperature is: (2)

- A. $^{\circ}\text{C}$
- B. $^{\circ}\text{F}$
- C. $^{\circ}\text{K}$
- D. K

3.7 Which statement is correct about the Alkali metals group in the Periodic Table? (2)

- A. They have density less than water
- B. They are the most reactive metals
- C. They form positive charged ions during ionic bonding
- D. All of the above

3.8 If concentration of H^+ is equal to 1×10^{-7} , then the solution is _____. (2)

- A. Neutral
- B. Basic
- C. Acidic
- D. Aqueous

3.9 The identity of a particular element on the Periodic Table is determined by the; (2)

- A. Number of electrons in the shell
- B. Number of protons and neutrons in the nucleus
- C. Number of protons in the nucleus only
- D. Number of protons, neutrons and electrons

3.10 Sodium hydrogen carbonate is used in the following; (2)

- A. Drains and oven cleaners
- B. Additive in food and drinks
- C. As an antacid to relieve indigestion
- D. Both A and C

QUESTION 4

[15]

Question Types: Brief statement responses.

4.1 Provide definitions for the following terms: (5)

- a. Compound
- b. Experimental value
- c. Atomic number
- d. An Indicator
- e. A salt

4.2 Use your knowledge of atomic structure to complete the following table.

Note: $Symbol = \text{mass no.} \cdot \text{Element}^{\text{net charge}}$

(4)

Symbol			$^{35}\text{Cl}^-$
Protons	9		17
Neutrons	10		18
Electrons		18	
Mass number		40	35
Net Charge	0	+2	

4.3 Classify the property exhibited in each of the following as a **physical extensive** or **intensive property**: (2)

- Iron is denser than aluminium: _____
- Mercury melts at -39°C : _____
- The volume of water in a tank is 2 500 L: _____
- The distance between Windhoek and Swakopmund is 352.5 km: _____

4.4 Name the products obtained from the following reactions: (2)

- Acid + Metal \rightarrow _____
- Acid + Water \rightarrow _____

4.5 Carry out the following calculations and provide the answers to the correct number of significant figures: (2)

- 0.237×6.792
- $409.35 + 0.98 + 0.238$

QUESTION 5

[15]

Question Type: Multiple Choice Questions. Each question carries **1 mark**.

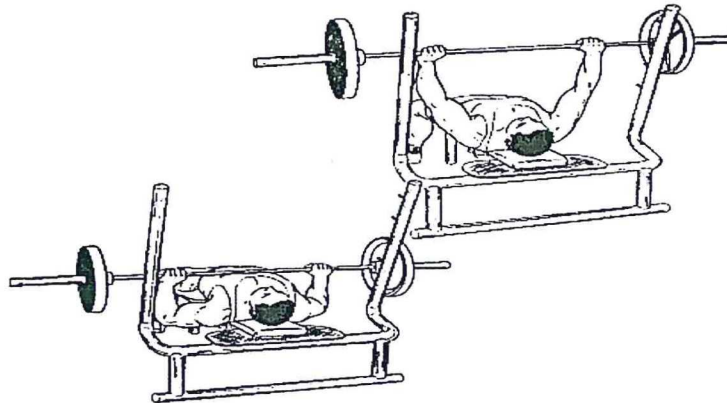
- 5.1 Which one is a renewable source of energy? (2)
- A. nuclear energy
 - B. natural gas
 - C. hydroelectric energy
 - D. coal
- 5.2 The correct order for generation of electricity from nuclear energy is _____. (2)
- A. Supply electricity → heat water to make steam → steam turns turbines → electrical power sent around the country
 - B. Fusion of uranium → heat water to make steam → steam turns turbines → electrical power sent around the country
 - C. Fission of uranium → heat water to make steam → steam turns turbines → electrical power sent around the country
 - D. Crushing of uranium Fission of uranium heat water to make steam → steam turns turbines → electrical power sent around the country
- 5.3 Which of the following is true for fossil fuels? (2)
- A. It is obtained from remains of plant and animal materials.
 - B. It can also be generated from biomass
 - C. It is a tidal source of energy
 - D. It can kill flocks of birds.
- 5.4 Peter uses energy of 800 J to carry a suitcase upstairs for a distance of 4 m. Assuming the acceleration due to gravity is 9.81 m/s^2 . Find the mass of the suitcase. (2)
- A. 20 g
 - B. 20 000 kg
 - C. 20 000 g
 - D. 200 000 kg

5.5 A 2500 gram ball is thrown into the air with an initial velocity of 30 cm/sec. Which statement is true about the ball when it reaches the top of its ascent? (2)

- A. Kinetic energy is at its highest
- B. Kinetic energy is equal to gravitational energy.
- C. The ball does not have energy at this position.
- D. Total energy is equal to potential energy of a ball.

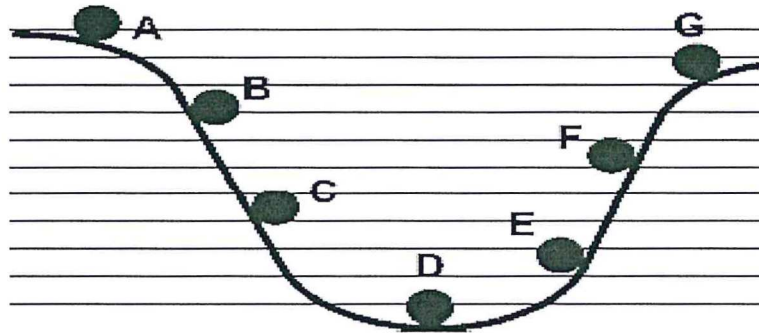
5.6 During the ascent phase of a rep of the bench press, the lifter exerts an *average* vertical force of 200 N against a barbell while the barbell moves 0.8 m upward. How much work did the lifter do to the barbell? (2)

BENCH-PRESS



- A. 0.8 J
- B. 200 J
- C. 800 J
- D. 160 J

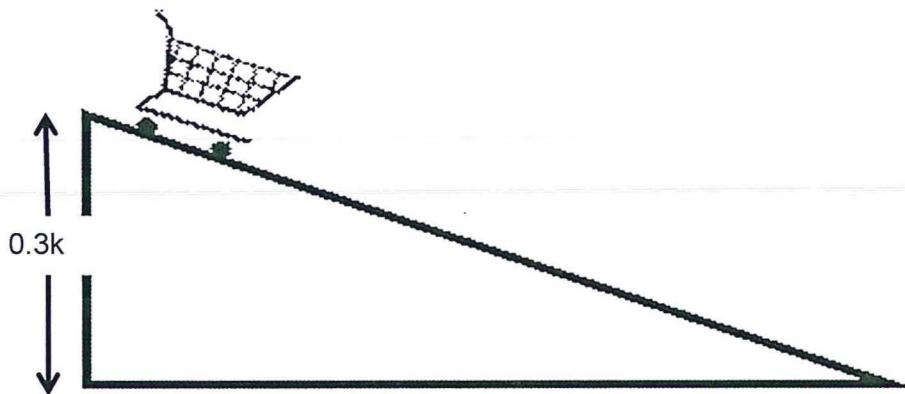
5.7 This graph shows a ball rolling from A to G. The ball starts at point A and rolls through to point G.



Which letter shows when the ball has the highest potential energy? (2)

- A. A only
- B. D and G
- C. C and E
- D. D and A

5.8 A cart at the top of a 0.3 km hill has a mass of 500 g? Assume that acceleration due to gravity is 10 m/s^2 .



What is the cart's gravitational potential energy? (2)

- A. 150 J
- B. 1500 J
- C. 15000 J
- D. 15000 Nm^2

5.9 Using the information from question 5.8 and assume that energy is conserved so that there is no friction. What is the speed at the bottom of the hill? (2)

- A. 137 m/s
- B. 173 m/s
- C. 173 m/s/s
- D. 77.5 m/s

5.10 Law of Conservation of Energy states that; (2)

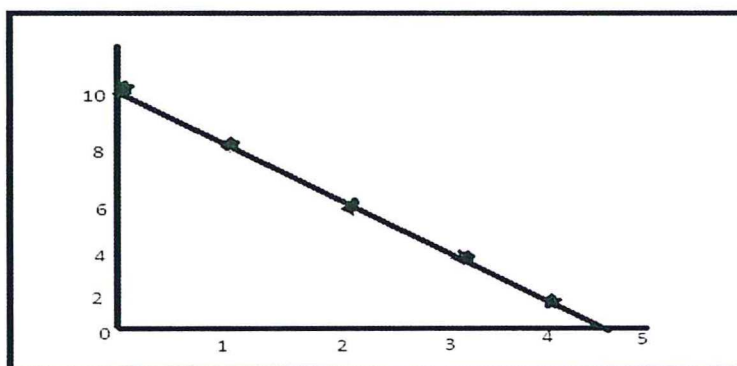
- A. Energy can be created or destroyed; it may be transformed from one form into another, but the total amount of energy never changes.
- B. Energy cannot be created or destroyed; it may be transformed from one form into another, but the total amount of energy never changes.
- C. A. Energy cannot be created or destroyed; it may be transformed from one form into another, but the total amount of energy changes.
- D. Energy can be created or destroyed; it may be transformed from one form into another, but the total amount of energy changes.

QUESTION 6

[10]

Question Type: Structured questions

6.1 An experiment carried out in the Physics laboratory to determine the rate of change of velocity has the following results presented in graphical form below. Using the diagram, answer the following questions:



- a. State the two important pieces of information missing from the graph? (2)
Information 1 is (i) _____

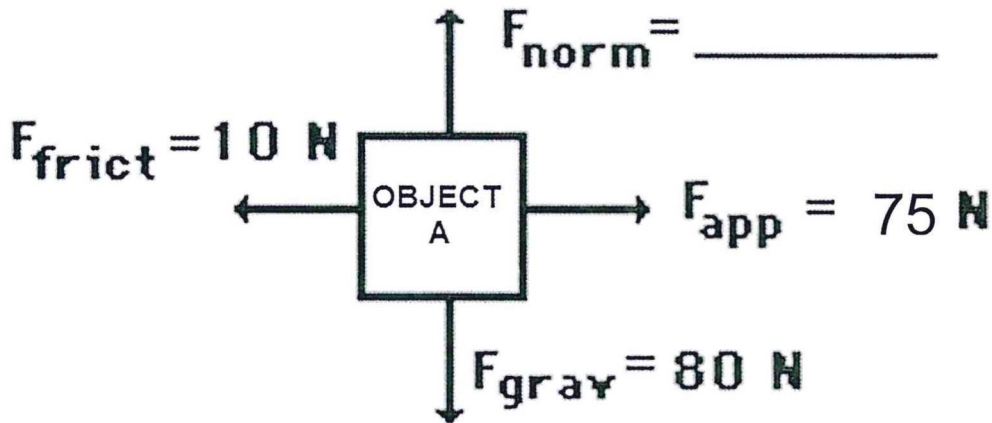
Information 2 is (ii) _____

b. The equation of a straight line is given by $Y = MX + C$

(i) From the graph above, what is the value of C ? (1)

(ii) At what time is the velocity = 2 m/s? (1)

6.2 An applied force (F_{app}) of 75 N is used to accelerate OBJECT A to the right across a frictional surface. The object encounters 10 N of friction (F_{frict}).



Use the diagram above to determine the:

(a) Normal force, F_{norm} . (2)

(b) Net force, F_{net} . (2)

6.3 Define the term **vector**. (2)

END

