



## TOM NEWBY SCHOOL EXAMINATION



|  |  |                    |                              |
|--|--|--------------------|------------------------------|
| <b>Subject</b>                             | <b>NATURAL SCIENCE</b>                       | <b>Examiner/s</b>  | <b>MR HUDSON, MRS FOURIE</b> |
| <b>Date</b>                                | <b>9 JUNE 2015</b>                           | <b>Total marks</b> | <b>100</b>                   |
| <b>Session</b>                             | <b>2</b>                                     | <b>Duration</b>    | <b>2 HOURS</b>               |
| <b>Grade</b>                               | <b>7</b>                                     | <b>Moderator</b>   | <b>MRS FOURIE</b>            |
| <b>Special instructions/<br/>Equipment</b> | Redraw the tables if asked for table format. |                    |                              |

This Exam has been compiled using notes and information contained in the Tom Newby School book. The marking memorandum has been compiled accordingly. While alternative responses will be given due acknowledgement, the official memorandum will be considered a priority document to ensure uniformity of marking. Up to 10% of the total mark allocation may be deducted for spelling and grammatical errors, except in the case of Language papers, where deductions are made according to a memorandum.

### MEMORANDUM

#### INSTRUCTIONS:

1. Answer all questions on the A4 lined paper provided.
2. Read the questions carefully before writing.
3. Rule off after each question/ section.
4. Where required you must redraw the tables.
5. Look carefully at the mark allocation.
6. Set out your work very neatly.
7. Do your best and good luck! Think before you INK!

#### SECTION A – QUESTION 1 - MULTIPLE CHOICE

Read the sentence/ statement and choose the correct answer. Write only the correct letter next to the number, e.g. 1 c

1. All of life on Earth exists in an area known as the ....
  - a) Hydrosphere
  - b) Litosphere
  - 
  - d) Atmosphere (1)
  
2. Seeds that are dispersed by being eaten by animals are....
  - a) light and dry
  - 
  - c) explosive
  - d) surrounded by hooks and barbs (1)

3. An organism that has a soft body, a muscular foot and a shell is a ....  
[REDACTED]  
b) mammal  
c) arthropod  
d) amphibian (1)
4. Which of the following are classified as invertebrates?  
a) snakes, birds and fish  
[REDACTED]  
c) crabs, ants, snakes and bees  
d) birds, bees, butterflies and ants (1)
5. An example of variation that is inherited is ....  
a) a tattoo  
b) tanned skin  
[REDACTED]  
d) body piercings (1)
6. Plants that produce cones and have naked seeds are called ....  
a) angiosperms  
b) monocotyledons  
[REDACTED]  
d) dicotyledons (1)
7. Arthropods are animals that have ....  
a) an exoskeleton  
b) an exoskeleton and six jointed legs  
c) six jointed legs and two pairs of wings  
d) [REDACTED] (1)
8. The best method to separate a mixture of sand and iron nails is ....  
a) filtration  
[REDACTED]  
c) evaporation  
d) sieving (1)

9. During respiration ....

- a) food is produced
- b) energy is needed
- c) growth occurs
- d) XXXXXXXXXX

(1)

10. A pollen grain has two sacs filled with air. It is probably carried by....

- a) birds
- b) wind
- c) insects
- d) XXXXXX

(1)

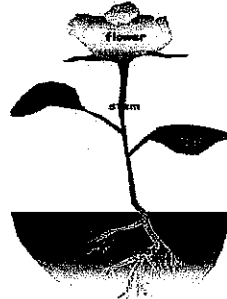
[10]

### **QUESTION 2- TRUE OR FALSE**

Say if the following sentences are TRUE OR FALSE. Write only TRUE or FALSE next to the number, e.g. 1 TRUE (REASONS WHETHER TRUE OR FALSE JUST FOR INFO FOR TEACHERS).

1. Fertilisation is the process where the use of specific techniques like injections, condoms and pills, prevent pregnancy.FALSE. Process where organisms(sperm cell of a male and ripe ovum of a female fuse together).
2. Puberty is a stage in your physical development when your body changes from a child to an adult. TRUE
3. The bladder protects and contains the testes. FALSE. The scrotum.
4. Boiling point is when a solid turns into a gas, at a high temperature. FALSE. Liquid turns into a gas.
5. Flexibility is a measure of how easy it is to bend a material.TRUE
6. Reptiles are warm-blooded organisms that are found in almost every habitat and environment in the world except for the Antarctic. FALSE.  
Cold-blooded
7. The biosphere is a group of different areas where life exists on earth. TRUE
8. Soil is abiotic (non-living) and is essential for plant growth. TRUE

9. If one substance is magnetic and the other is not, a magnet may be used to separate the mixture. TRUE
10. Strong materials will bend, break, shatter or deform when subjected to external forces FALSE . Strong materials will not bend, break or shatter.



[10]

### **QUESTION 3- FILL IN THE MISSING WORD/ WORDS:**

Make use of the following sentences or statements. Make use of the words in the word bank below to help you. Write only the missing word. Do not rewrite the whole sentence.

|                    |               |                    |             |
|--------------------|---------------|--------------------|-------------|
| Chlorine           | contraceptive | prevention measure | cement      |
| bricks             | gas           | pollination        | variation   |
| stigma             | ovary         | concrete           | inheritance |
| Fertilisation      | excretion     | consumption        | reptile     |
| plastic cling wrap | amphibian     | mixture            | solute      |
| Foil               | molluscs      | movement           | growth      |
| solvent            | newspaper     | soluble            |             |
| Crustaceans        |               |                    |             |

- The part of a flower that contains the ovules is called the ovary (1)
- Gas at room temperature is called chlorine (1)
- Cement is very heavy and is not water-tight. (1)
- A variation is a characteristic that is passed down from parents to their young. (1)
- The process that transfers pollen to the stigma of the flower is called pollination. (1)
- A device or method that is used to prevent pregnancy is called a contraceptive. (1)
- Excretion means when all living things produce waste which must be removed from the body. (1)

8. A/ An amphibian has /have smooth, naked skin and undergoes metamorphosis. (1)
9. Plastic cling wrap is too thin and cannot hold a specific shape. (1)
10. A mixture is not a pure substance. (1)



[10]

**QUESTION 4****MATCH THE COLUMNS**

Match the statement in Column A with the term in column B. Write only the number and the letter of your choice on your answer sheet, e.g. 4G

| COLUMN A                    | COLUMN B  |
|-----------------------------|---|
| 1. External fertilisation E | A. Cephalothorax, abdomen, compound and /or simple eyes.              |
| 2. Fish G                   | B. Have jointed legs and an exoskeleton                               |
| 3. Arthropods B             | C. Everything around us is made up of .....                           |
| 4. Stamen H                 | D. Melts at about 800 ° C   |
| 5. Matter C                 | E. The fusion of egg cells and sperm cells outside the mother's body. |
| 6. Melting point F          | F. When ice melts and changes from a solid to a liquid.               |
| 7. Arachnids A              | G. Cold-blooded, aquatic organisms that live in fresh or salt water.  |
| 8. Salt D                   | H. Male part of a flower, made up of the anther and a filament.       |
| 9. Magnets J                | I. Made up of only one type of particle.                              |
| 10. Pure substance I        | J. Used in recycling to recover substances or to attract iron.        |

[10]

## **SECTION B - ANALYSING PICTURES AND OR IMAGES OF ANIMALS**

### **QUESTION 5.1**

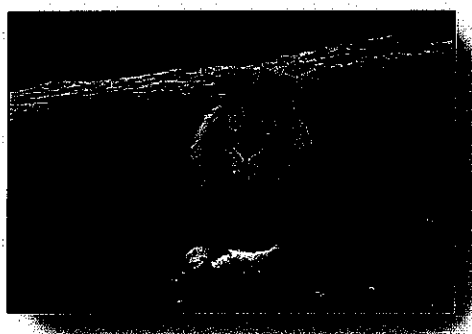
Analyse the following pictures / images. Fill in the missing answers in a table format on your lined paper. Give information relating to the images given.

#### **PICTURE A**

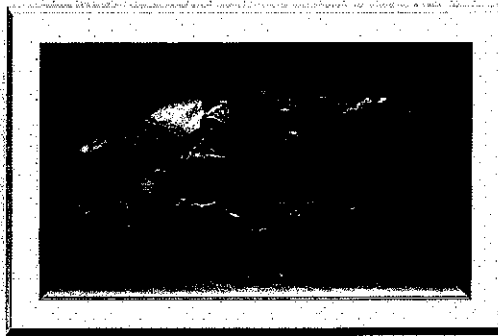


|                             |              |       |
|-----------------------------|--------------|-------|
| <b>PHYLUM</b>               | Vertebrate   | (1/2) |
| <b>CLASS</b>                | Reptile      | (1/2) |
| <b>RESPIRATION METHOD</b>   | Lungs        | (1/2) |
| <b>MOVEMENT</b>             | Limbs        | (1/2) |
| <b>WARM OR COLD-BLOODED</b> | Cold-blooded | (1/2) |
| <b>REPRODUCTION METHOD</b>  | Lays eggs    | (1/2) |

#### **PICTURE B**



|                             |                   |       |
|-----------------------------|-------------------|-------|
| <b>PHYLUM</b>               | Vertebrates       | (1/2) |
| <b>CLASS</b>                | Mammal            | (1/2) |
| <b>RESPIRATION METHOD</b>   | Lungs             | (1/2) |
| <b>MOVEMENT</b>             | Limbs for running | (1/2) |
| <b>WARM OR COLD-BLOODED</b> | Warm-blooded      | (1/2) |
| <b>REPRODUCTION METHOD</b>  | Live young        | (1/2) |



**PICTURE C**

|                             |                     |       |
|-----------------------------|---------------------|-------|
| <b>PHYLUM</b>               | Vertebrates         | (1/2) |
| <b>CLASS</b>                | Amphibian           | (1/2) |
| <b>RESPIRATION METHOD</b>   | Lungs and /or gills | (1/2) |
| <b>MOVEMENT</b>             | Webbed feet swim    | (1/2) |
| <b>WARM OR COLD-BLOODED</b> | Cold-blooded        | (1/2) |
| <b>REPRODUCTION METHOD</b>  | Lays eggs           | (1/2) |

**QUESTION 5.2**

Answer the following question.

All crustaceans have a) jointed (1/2) legs and b) a hard, shell-like exoskeleton(1/2).

[10]

**QUESTION 6.1**

**PLANTS**

Tabulate three differences between monocotyledonous and dicotyledonous plants. (6)

| <b>MONOCOTYLEDONOUS</b>     | <b>DICOTYLEDONOUS</b>                      |
|-----------------------------|--|
| 1) 3,6 or 9 petals          | 1) 4,5 petals or multiples of these        |
| 2) Parallel veined leaves   | 2) Net-veined leaves                       |
| 3) Adventitious root system | 3) Tap root system/ roots out of main root |

4) Stem green and flexible

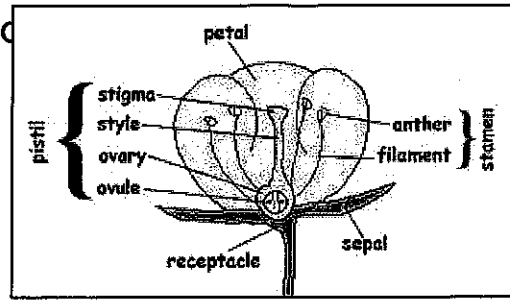
4) Stem hard and woody

**QUESTION 6.2**

Describe and explain the function of the following parts of a flower:

- Anther- It is part of the stamen and the male part of the flower. Grains of pollen are produced in the anther.
- Filament - The filament supports the anther.
- Stigma- The stigma receives pollen during pollination

- d) Ovary- Ovary contains the ovules/ seeds and is situated at the bottom on the inside of the flower.



(4)

[10]

### QUESTION 7 - HUMAN REPRODUCTION

1. Describe the function of the testes. It makes millions of sperm cells. Secrete male hormone called testosterone. (2)
2. How many sperm are needed to fertilise an egg? One sperm cell is enough. A sperm cell can fuse it, as it swims up the fallopian tube. (1)
3. Two eggs were released during ovulation. If a woman had sexual intercourse, suggest what might happen. She might expect twins or more than one baby. (1)
4. In plants the egg cells are fertilised after pollination. Write a short paragraph to explain how the male sperm reaches the egg cells in a female. The sperm swims up from the cervix, up through the uterus, into the fallopian tubes. If an ovum is present, one sperm cell can fuse with it. This is called fertilisation. (3)
5. Explain shortly what menstruation means and how long a menstrual cycle is. Menstruation is a sign that a female's body has prepared itself to fall pregnant. Monthly bleeding begins and the normal cycle lasts for 28 days. (3)
6. What do we call the developing baby during the different stages of pregnancy? How many months is a woman pregnant? Embryo, foetus, baby. A woman is pregnant for 9 months. (4)
7. Define the following terms:
  - a) Puberty - When a teenager starts turning into a young adult and hormones are starting to make changes in a boy/ girls body. (1)

b) Fertilisation - It is the process where a female's body prepares itself for pregnancy / when a female egg is ready for fusing with a male sperm. (1)

8. Explain why a pregnant woman should eat a healthy diet and not take drugs or drink alcohol. Anything that the expectant mother is eating is affecting the baby, so if she uses alcohol, the baby can be born smaller or under the expected weight. A baby is connected to the mother through the umbilical chord so the baby will be born with no side-effects if the mother stays healthy and eats healthy food.

(2)

What are the fertilisation stages in humans from sexual intercourse to pregnancy? Every month, an ovary will release an egg cell for fertilisation. This process is known as ovulation. After the penis enters the vagina, semen is ejaculated and the sperm cells then moves through the cervix and uterus into the fallopian tube where the 1st sperm cell to arrive, fertilises the egg. The fertilised egg then travels back through the fallopian tubes to attach to the uterus where there is a thick layer of blood known as the uterine lining. The woman will then become pregnant and a baby will develop within the uterus. If fertilisation does not occur then the layer of blood breaks down and is released, during menstruation, through the vagina.

(2)

[20]

### **QUESTION 8 - MATTER AND MATERIAL**

Explain briefly using the images below, what would happen if the object was made out of the incorrect properties. A) It would be flexible, bend easily and we won't be able to climb up the ladder. It would not stand.

B) The glass would shatter and break. We would not be able to cut with the knife.

C) Water will flow through the mesh.

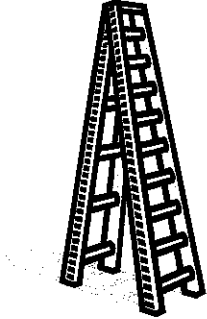
D) It will get wet in the rain or outside and it will not stand. It will fall down.

E) Too hard and too heavy to play with or kick. People/players would hurt / break their foot if they kick it.

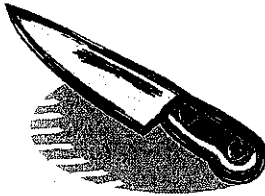
8.1

(5)

A) If a ladder was made of rubber



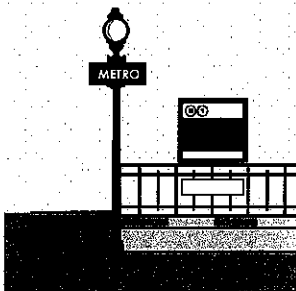
B) If a knife was made of glass



C) If a bucket was made of wire mesh



D) If a lamp post was made out of cardboard



E) If a soccer ball was made of iron



A) Which materials would be suitable to make each of the objects above (A,B,C,D,E)? (5)

Wood, aluminium for the ladder, high-grade steel, stainless steel for the knife and or a wooden handle/ galvanised steel/ iron for the bucket or plastic, steel for a lamp post, leather and or plastic for a soccer ball.

Name any three methods of how mixtures can be separated. (3)

Evaporation, Distillation, Magnetism, Filtration (any 2)

8.2 Explain briefly how you would separate the following mixture:

Sugar, water and alcohol (2)

Use the method of Distillation: Place the mixture in a flask. Use a condenser to collect the alcohol. Heat the mixture to 70 degrees Celcius so the alcohol will evaporate. Heat the rest of the mixture to 100 degrees Celcius. Collect the water and the sugar crystals will be left behind.

8.6 What is ink chromatography? Give a short definition. (2)

Ink chromatography is used to separate a mixture of different pigments. Some pigments/ colours dissolve more easily than others.

8.7 What can forensic scientists find out through chromatography? (2)

They are able to use it to catch criminals, by matching documents or stains found at a crime scene to a marker or a pen or a ransom note, that belongs to a suspect.

8.8 What is the apparatus called that we use for distillation? A Liebig condenser (1)

[20]

**GRAND TOTAL: [100]**

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