

Sec II Science and Technology Term 3 Exam Review**Characteristic/Non-characteristic properties**

1. For each of the following, state whether the properties is characteristic (C) or non-characteristic (NC)

- |                                |                                |
|--------------------------------|--------------------------------|
| a. mass__ <b>NC</b> __         | h. atomic number__ <b>C</b> __ |
| b. volume__ <b>NC</b> __       | j. pH__ <b>NC</b> __           |
| c. density__ <b>C</b> __       | k. length__ <b>NC</b> __       |
| e. temperature__ <b>NC</b> __  | l. distance__ <b>NC</b> __     |
| f. melting point__ <b>C</b> __ | m. colour__ <b>NC</b> __       |
| g. boiling point__ <b>C</b> __ |                                |

**Density**

2. Express the following information as a density:

- a. An irregular object with a mass of 18 kg displaces 2.5 L of water.

$$D = \frac{m}{V} = \frac{18kg}{2.5L} = 7.2kg/L$$

- b. A 250 g piece of rock has a volume of 50 cm<sup>3</sup>.

$$D = \frac{m}{V} = \frac{250g}{50cm^3} = 5g/cm^3$$

3. Metal A has a mass of 600 g and displaces 100 cm<sup>3</sup> of water while Metal B has the same mass and has a volume of 75 mL. Which metal has a higher density?

$$\text{Metal A} \quad D = \frac{m}{V} = \frac{600g}{100cm^3} = 6g/cm^3$$

$$\text{Metal B} \quad D = \frac{m}{V} = \frac{600g}{75mL} = 8g/mL$$

**Metal B has the higher density**

4. What happens to the density of air in a balloon if the volume is increased while the mass remains constant?

**If volume is increased but mass remains the same, that means that the mass is more spread out so the density is decreased**

## Atoms, molecules and periodic table

5. State the name and symbol of the first 20 elements from the periodic table.

H	Hydrogen	Na	Sodium
He	Helium	Mg	Magnesium
Li	Lithium	Al	Aluminum
Be	Beryllium	Si	Silicon
B	Boron	P	Phosphorus
C	Carbon	S	Sulfur
N	Nitrogen	Cl	Chlorine
O	Oxygen	Ar	Argon
F	Fluorine	K	Potassium
Ne	Neon	Ca	Calcium

6. What is a molecule? a group of 2 or more atoms that are chemically bonded together

7. What is the smallest particle of matter that can exist on its own? atom

8. Match the formula with the following molecular model given

gray = oxygen

white = hydrogen

black = carbon

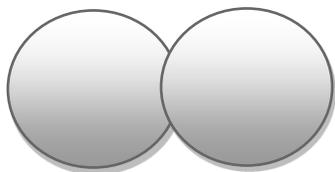
Carbon dioxide (CO<sub>2</sub>)

Oxygen (O<sub>2</sub>)

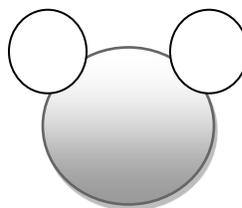
Water (H<sub>2</sub>O)

Methane (CH<sub>4</sub>)

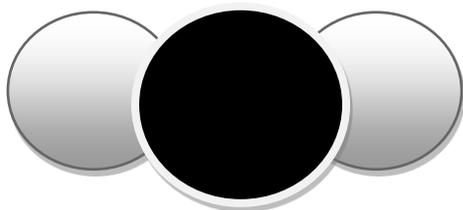
a. Oxygen



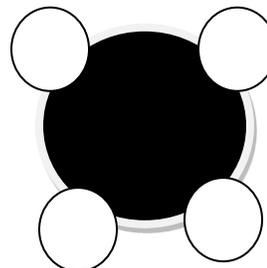
b. Water



c. Carbon dioxide



d. Methane



9. For each of the molecules above, state the number of atoms of each element.

a. 2 oxygen

b. 2 hydrogen, 1 oxygen

c. 1 carbon, 2 oxygen

d. 1 carbon, 4 hydrogen

10. How is it determined where in the periodic table an element is placed? the position of an element on the periodic table is determined by the number of protons

11. For each of the following state the location, mass, and charge:

a. Proton: in nucleus; 1 amu; positive

b. Electron: in orbits; negligible; negative

c. Neutron: in nucleus; 1 amu; neutral

12. If fabric softener is not used, sometimes socks stick together when they are removed from the dryer. Explain why using electrons and static electricity In the dryer, as the clothes tumble they are being rubbed against each other and the walls of the dryer's drum. This causes friction which allows electrons to move from one substance to another creating a static charge

13. Same charges will (attract or **repel**) and opposite charges will (**attract** or repel).

### Cells and cellular processes

14. Match the cell organelles on the left to their appropriate roles on the right

a. Cell membrane 4

1) Produce energy

b. Cytoplasm 2

2) Holds organelles in place

c. Nucleus 7

3) Absorbs energy from the sun for photosynthesis

d. Endoplasmic reticulum 8

4) Controls what comes in and goes out of the cell

e. Vacuoles 5

5) Storage of nutrients and other substances

f. Mitochondria 1

6) Thick support for plant cells

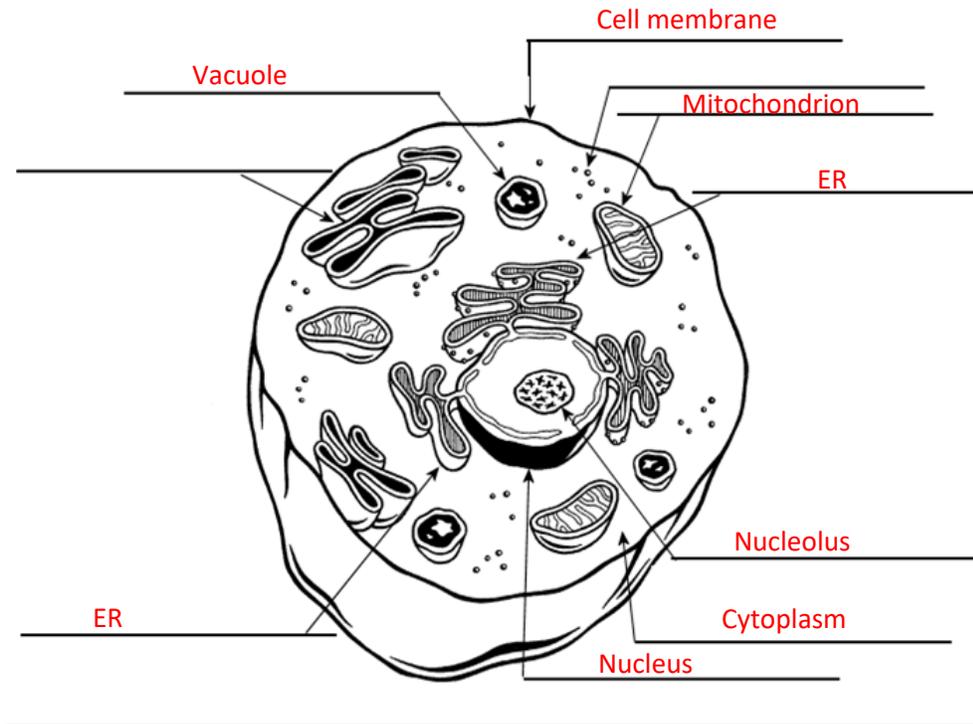
g. Cell wall 6

7) Directs cell's activities

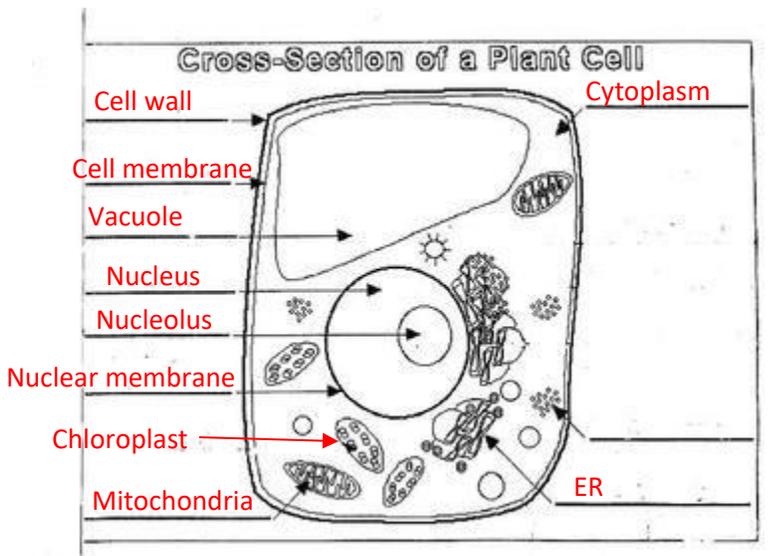
h. Chloroplast 3

8) Cellular transport and protein production

14. Label the organelles (except chloroplast and cell wall) from question 13 on the animal cell below



15. Label the organelles from question 13 on the plant cell below



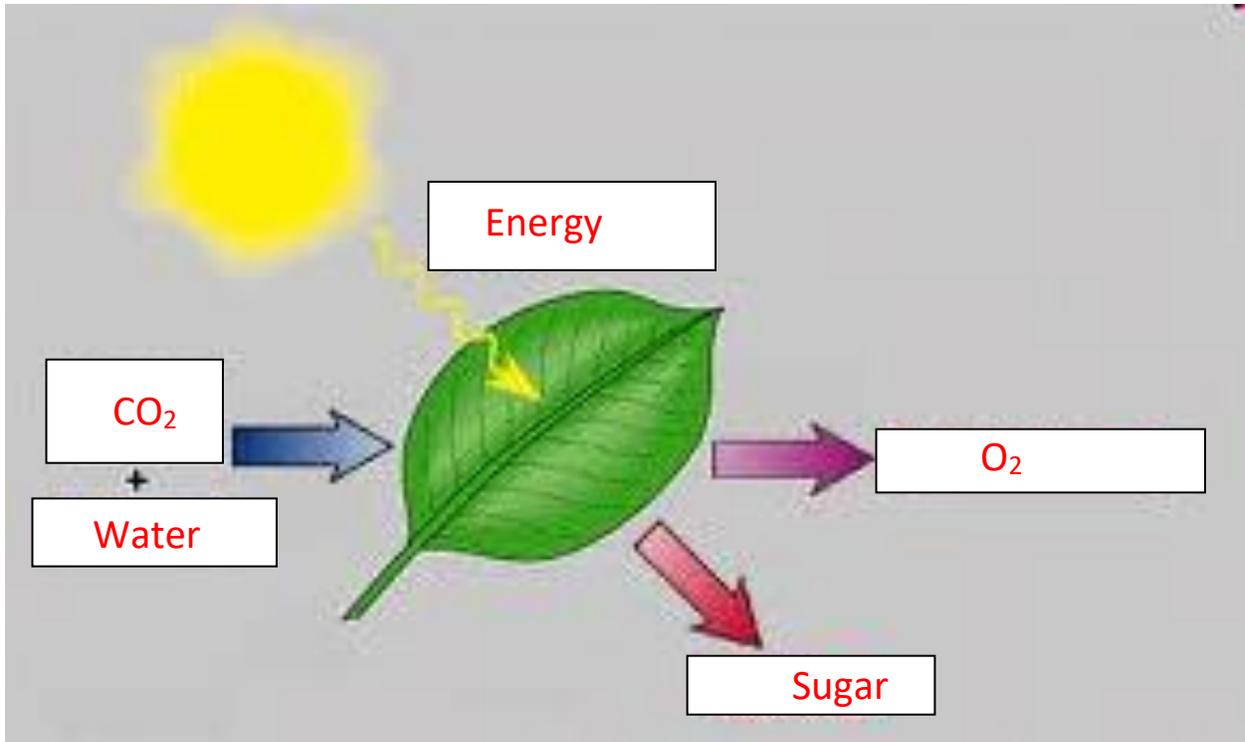
16. All living things are comprised of cells. It is the bases of life. What are other characteristics of living things? **need energy, respond to stimuli, growth and repair, reproduce, respire, excrete waste, movement.**

17. Write the equation for cellular respiration  $\text{oxygen} + \text{sugar} \rightarrow \text{carbon dioxide} + \text{water} + \text{energy}$

18. State whether the statement describes diffusion (D) or osmosis (O)

- Solute moves from a high concentration to a low concentration D
- Water moves from an area of low solute concentration to an area of high solute concentration O

19. Label the diagram of photosynthesis



20. What is the difference between photosynthesis and cellular respiration?

Cellular respiration:  $\text{oxygen} + \text{sugar} \rightarrow \text{carbon dioxide} + \text{water} + \text{energy}$   
done by all living things

Photosynthesis:  $\text{carbon dioxide} + \text{water} + \text{energy} \rightarrow \text{oxygen} + \text{sugar}$   
only in plants

21. What is the term used to describe molecules when they are evenly spread out in the space they occupy? equilibrium

## Reproduction

22. Define the following:

- a. Asexual reproduction: reproduction where an organism creates an exact copy of itself
- b. Sexual reproduction: reproduction where a male and female zygote combine to create a new organism
- c. Embryo: 4-8 weeks in the pregnancy
- d. Fertilization: the combination of the sperm and the egg
- e. Ova: the female gamete
- f. Fetus: the unborn child
- g. Spermatazoa: the male gamete
- h. Zygote: the combination of the sperm and the ova

23. Describe, in steps, the reproductive process of humans:

- 1) Male and female gametes (sperm and egg) come together (fertilization) to form the zygote
  - 2) The zygote eventually develops into an embryo (2 weeks)
  - 3) After 9-10 weeks the embryo develops into a fetus
  - 4) The child is born (baby or infant)
  - 5) The infant will grow into a toddler and child
  - 6) The child will become an adolescent and start to undergo puberty
  - 7) Sexual maturity is reached
- Cycle restarts

24. What are the stages of Human Development starting at fertilization with the zygote?

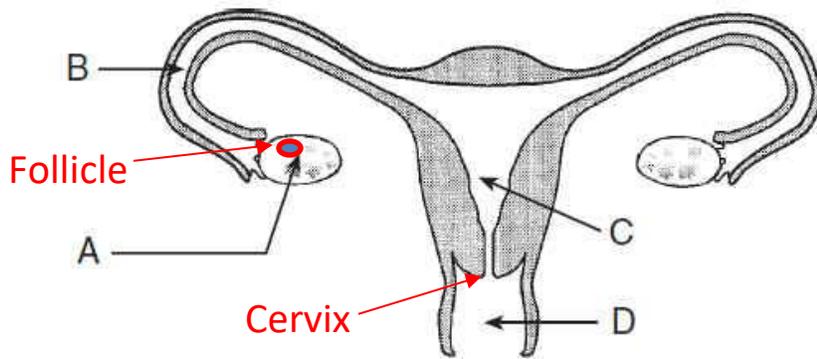
zygote -> embryo -> fetus -> baby -> toddler -> child -> adolescent -> adult -> old age

25. List 3 STI. What are possible health risks associated with STI?

Gonorrhea, chlamydia, genital warts, herpes, etc

Cancer, heart disease, brain disease, sterility

26. Label the following diagram of the female reproductive system.



A. Ovary

B. Fallopian Tube

C. Uterus

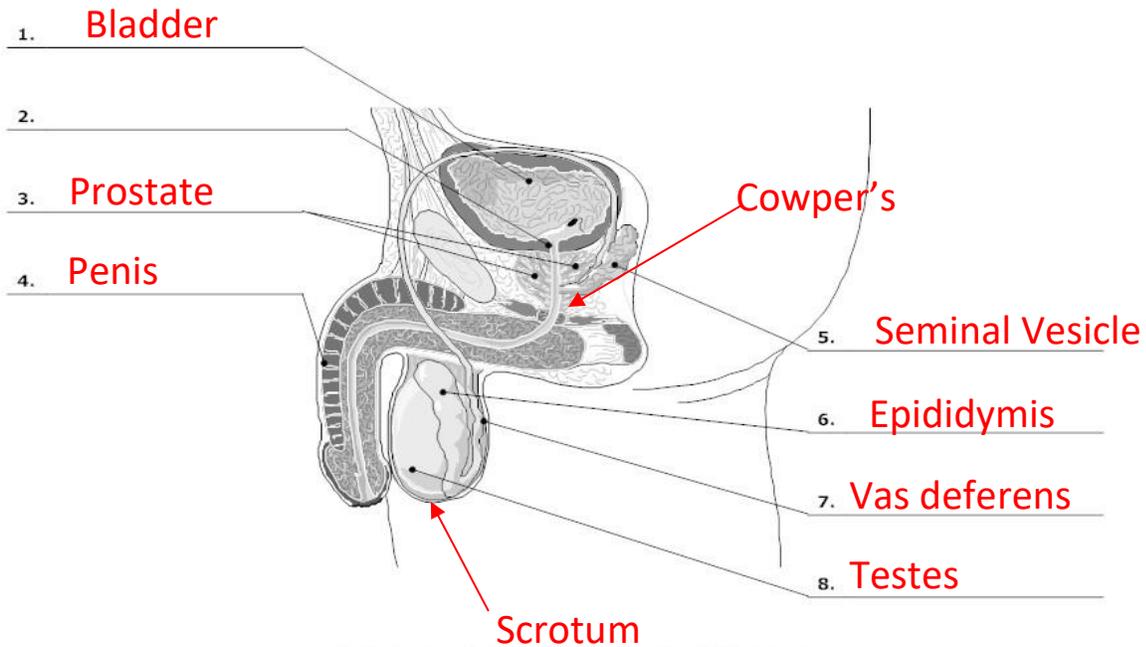
D. Vagina

E. Label the cervix

F. Add follicles to the diagram and label them

27. Label the following diagram of the male reproductive system.

Male Reproductive System and Organs



9. Label the Cowper's gland

10. Label the scrotum

