

## ISTA Senior Science Quiz Final Q&A 2018

### Round 1:

1. Former President of Ireland and newly appointed Chair of the Elders, Mary Robinson, is a <b>pescatarian</b> . What does this mean?	a person who <b>does not eat meat but does eat fish</b> .
2. Ozone absorbs much of the ultraviolet radiation in which <b>layer</b> of the atmosphere?	<b>Stratosphere</b>
3. Which <b>two</b> celestial bodies cause tides?	<b>Moon &amp; Sun</b>
4. <b>Name</b> the odourless gas also known as <b>marsh gas</b> .	<b>Methane</b>
5. In terms of which <b>constant</b> will the <b>kilogram</b> be redefined in May 2019?	<b>Planck constant,</b>
6. What is the name of the book, based on the series of lectures, given by Schrödinger in Trinity College 75 years ago?	<b>What is life?</b>

### Round 2:

1. Plastic pollution has become one of the greatest scourges of this generation. What is the main <b>source</b> of <b>synthetic plastics</b> ?	<b>Crude oil/ Petroleum</b>
2. Write a <b>balanced chemical equation</b> for the reaction of <b>bread soda</b> with <b>vinegar</b> .	<b><math>\text{NaHCO}_3 + \text{CH}_3\text{COOH} = \text{CH}_3\text{COONa} + \text{H}_2\text{O} + \text{CO}_2</math></b>
3. Louise Brown celebrated her 40 <sup>th</sup> birthday this year and is famous for being born after conception by IVF. What does <b>IVF</b> stand for?	<b>In Vitro Fertilisation</b>
4. TESS (Transiting Exoplanet Survey Satellite) is a space telescope launched in April. What is it designed to search for in space?	<b>Exoplanets</b>
5. Give the <b>binomial name</b> of this eukaryotic protozoan.	<b>Amoeba proteus</b>
6. RCD is a current-activated circuit-breaker used as a safety device for mains-operated electrical tools and appliances. What does the acronym <b>RCD</b> stand for?	<b>Residual Current Device</b>

### Round 3:

1. The 'Theory of Everything' was a film about which famous cosmologist who died this year?	<b>Stephen Hawking</b>
2. Name <b>two metal</b> elements which are not silver in colour?	<b>Copper &amp; Gold</b>
3. Identify this <b>molecule</b> which consists of a porphyrin ring, coordinated to a central magnesium atom.	<b>Chlorophyll</b>
4. Define <b>Biological Oxygen Demand</b>	the <b>amount of dissolved oxygen consumed</b> by biochemical action when a sample of water is kept in <b>darkness at 20°C for 5 days</b> .
5. Which <b>two planets</b> have no known moons?	<b>Mercury &amp; Venus</b>
6. What is the name of the protein found in muscles?	<b>Myosin (&amp; actin)</b>

### Round 4:

#### **DOWN:**

1. An enzyme used to break down Polyethylene terephthalate (**PET**), which is a plastic widely used for soft drinks. **PETASE**
2. Pushing a person in a swing is a common example of a system that vibrates with increasing amplitude at some frequencies of excitation. **RESONANCE**
3. A three-dimensional image formed by the interference of light beams from a laser or other coherent light source. **HOLOGRAM**

#### **ACROSS:**

4. An allergy to grass and other pollen which causes cold symptoms in sufferers e.g. hay fever **POLLINOSIS**
5. The production of abnormally large volumes of dilute urine. **POLYURIA**
6. A programming language & a unit of pressure. **PASCAL**

### Round 5:

1. Which gas diffuses faster in the blood? <b>Oxygen or Carbon dioxide?</b>	<b>Carbon dioxide</b>
2. Why is the shape of <b>hydrogen sulfide</b> v-shaped and not linear?	<b>Lone pair – lone pair repulsion</b>
3. The wonders of Epsom salt have been known for hundreds of years, its beneficial properties can soothe the body, mind, and soul. What is the main <b>component of Epsom salts?</b>	<b>Magnesium sulfate/ MgSO<sub>4</sub></b>
4. Lyme disease is caused by which kind of <b>arachnid?</b>	<b>Tick</b>
5. If the acceleration due to gravity on a planet is 20 ms <sup>-2</sup> at the surface, what the <b>acceleration</b> at a height of 3 times the radius above the surface?	<b>1.25 ms<sup>-2</sup></b> <i>Gravity is proportional to 1 /distance squared</i> <i>Height of 3R above surface = distance from centre of planet of 4R</i> <i>So R--&gt; 4R will reduce gravity by 1/4 squared i.e. divided by 16</i> <i>20/16 = 1.25 ms<sup>-2</sup></i>
6. Does it take a <b>longer or shorter</b> time to prepare hard-boiled eggs at the top of Mount Everest?	<b>Longer</b>

### Round 6:

1. <b>Tullgren Funnel</b>	<b>used to extract living organisms from samples of soil.</b>
2. <b>Desiccator</b>	<b>used to protect chemicals which are hygroscopic or which react with water from humidity.</b>
3. <b>Newton's cradle</b>	<b>used to demonstrates the principle of the conservation of momentum</b>
4. <b>Centrifuge</b>	<b>used for the separation of fluids based on density.</b>
5. <b>Bomb Calorimeter</b>	<b>used to measure Heat of Combustion</b>
6. <b>State Boyles Law</b>	<b>states that at constant temperature the volume of a fixed mass of gas is inversely proportional to the pressure applied.</b>

### Round 7:

1. <b>IUPAC</b> is the organisation which names elements. What do the letters stand for?	<b>International Union of Pure and Applied Chemistry</b>
2. How are <b>heavy metal ions</b> removed from water?	<b>Precipitation</b>
3. What is the effect on the <b>resistance</b> of a wire if its radius is doubled?	<b>Decreases by a factor of 4</b>
4. What is <b>phobophobia</b> ?	<b>Fear of being afraid</b>
5. In a vacuum chamber, which will land first, when dropped from the same height, an apple or a feather?	They fall at the <b>same time</b>
6. This week a 77-year old Sligo woman was recognised as the world's longest surviving recipient of <b>which organ</b> ?	<b>Lung</b>

### Round 8:

1. Who was the <b>English physician</b> and scientist who was the pioneer of the <b>smallpox</b> vaccine?	<b>Edward Jenner</b>
2. Identify this <b>famous equation</b> that is used to find the allowed energy levels of quantum mechanical systems? $-\frac{\hbar^2}{2m} \nabla^2 \psi + V(\mathbf{x})\psi = E\psi$	<b>Schrödinger equation</b>
3. The International Space Station is in a LEO. What does <b>LEO</b> stand for?	<b>Low Earth Orbit</b>
4. According to a recent study removing which <b>vestigial organ</b> reduces the risk of Parkinson's disease by up to 25%?	<b>Appendix</b>
5. The label on a bottle of vinegar has 5% (v/v) acetic acid content. How many cm <sup>3</sup> of acetic acid does a litre of the vinegar contain?	5cm <sup>3</sup> in 100cm <sup>3</sup> <b>50cm<sup>3</sup> in 1000cm<sup>3</sup></b>
6. Atoms of which <b>element</b> make buckminsterfullerenes?	<b>Carbon/C</b>