ROUND 1 PHYSICS HODGE PODGE

1. Which German astronomer argued that the star of Bethlehem may have been a conjunction of Jupiter and Saturn?
   Johannes Kepler

2. What was originally called a Leyden jar?
   A capacitor

3. For which atom is tritium an isotope?
   Hydrogen

4. For what does the S in SPDF stand in the original atomic nomenclature?
   Sharp (S is the angular momentum quantum number)

5. What is Planck’s constant (number and units with bonus point for most correct sig figs)?
   \(6.62606957(29) \times 10^{-34}\) Js

6. What is the charge on the electron (number and units with bonus point for most correct sig figs)?
   \(-1.602176565(35) \times 10^{-19}\) C

7. If Santa Claus falls down a 5-metre high chimney from rest, what will be his velocity when he hits the ground (assume \(g = 10\) m/s\(^2\))?
   \(v = \sqrt{2gy}\)
   \(10\) m/s

8. What is the maximum possible score for the word PHYSICS, played at the start of a Scrabble game (H and Y = 4, P and C =3, I and S = 1)?
   94 (22 x 2 + 50 bingo bonus)

9. Name either of the two Dutch physicists who won the second Nobel prize in 1902 “in recognition of the extraordinary service they rendered by their researches into the influence of magnetism upon radiation phenomena”?
   Hendrik Lorentz, Pieter Zeeman

10. Name any of the three American physicists who won the 1972 Nobel prize “for their jointly developed theory of superconductivity usually called the BCS theory.”
    John Bardeen, Leon Cooper, John Schrieffer
ROUND 2 HISTORY

1. Which number Amendment to the U.S. Constitution outlawed slavery and involuntary servitude except as a punishment to a crime (as seen in the movie Lincoln)?

13

2. Who was Queen Victoria’s husband from 1840-1861?

Prince Albert

3. Which New York Herald reporter’s reputed words upon finding the missing Scottish explorer in Tanzania in 1871 were “Dr. Livingstone I presume?”

Henry Morton Stanley

4. What name was Queenstown, Cork changed to after the formation of the Irish Free State in 1920?

Cobh

5. What connects September 14, 1901, Buffalo, New York and November 22, 1963, Dallas, Texas?

U.S. Presidential assassinations (McKinley and Kennedy)

6. What connects June 30, 1908 Tunguska, Siberia and February 15, 2013 Chelyabinsk, Russia?

Meteor strikes

7. What paradigm changing first occurred at 10:30 pm October 29, 1969, involving UCLA and Stanford?

First internet message (LOGIN by Charley Kline on ARPANET)

8. What milestone was achieved on October 14, 1947, Mojave Desert and Roswell October 14, 2012

Breaking the sound barrier (with and without machine, by Chuck Yeager and Felix Baumgartner)

9. What last occurred on February 9, 1986 and prior to that on April 20, 1910?

Halley’s comet perihelion

10. Name any one of the top three Twitter-followed people (with 36 m, 35 m, and, 33 m followers respectively)?

Justin Bieber, Lady Gaga, Katy Perry
1. Who wrote *The Left Hand of Darkness*, which includes NAFL (Nearly As Fast As Light) travel?

Ursula K. Le Guin

2. In the 1997 film *The Saint* starring Val Kilmer, for what did American electrochemist Emma Russell played by Elizabeth Shue find a formula?

Cold fusion

3. What is the 1998 Michael Frayn play about the 1941 meeting between Niels Bohr and Werner Heisenberg called?

*Copenhagen*

4. Who wrote *The Hitchhiker’s Guide to The Galaxy*?

Douglas Adams


Phasers

6. On which musical instrument did Richard Feynman become accomplished?

Drums (bongo drums)

7. Which Austrian physicist and former professor at the Dublin Institute of Advanced Studies wrote the 1942 book *What is Life*?

Erwin Schrödinger

8. Who wrote the modern opera *Einstein on the Beach* first performed at the Avignon Festival, France on July 25, 1976?

Philip Glass

9. Which American astronomer, astrophysicist, and cosmologist co-wrote and narrated the 1980 television series *Cosmos* and wrote the novel *Contact*, on which the 1997 film was based?

Carl Sagan

10. Who is the British astrophysicist, D: Ream keyboard player, and BBC presenter of *Wonders of the Solar System* and *Wonders of the Universe*?

Brian Cox
Ireland 2013 IOP Intervarsity Physic Quiz

ROUND 4 NAME THE TIME FRAME

1. Century: In which century was the first circumnavigation of the earth (headed by Magellan until his untimely death three-quarters round)?
   16th (1519–1522)

2. Century: In which century did Galileo Galilei die and Isaac Newton was born?
   17th (1642)

3. Decade: In which decade did the first public railway open (a steam locomotive line built by George Stephenson between Stockton and Darlington in the U.K.)?
   1820s (1825)

4. Decade: In which decade did William Rowan Hamilton discover quaternions? According to Hamilton, the equations came to him while walking on the Royal Canal in Dublin with his wife. He used his pen knife to carve them into Broom Bridge for fear of forgetting.
   1840s (October 14, 1843)

5. Year: In which year did Albert Einstein write his four celebrated papers (his annus mirabilis)?
   1905 (Spot prize for the 4 papers)

6. Year: In which year did Michael Collins sign the Anglo-Irish Treaty in London?
   1921 (December 6)

7. Month and year: In which month and year did Apollo 11 land on the moon?

8. Month and year: In which month and year did Ireland clinch their last Six Nations rugby Grand Slam?
   March, 2009 (Ireland beat Wales at the Millennium Stadium 17–15 on March 21, 2009)

9. What is the time constant of a 2-micro farad capacitor in series with a 2 kilo-ohm resistor?
   $4 \times 10^{-3}$ seconds (4 milliseconds)

10. How many attoseconds are there in a second?
    $10^{18}$ (a trillion trillion)
ROUND 5 SCIENCE MUSIC (Name the band/performer)

1. Rolling Stones (Time is on my Side)
2. Lou Reed (Satellite of Love)
3. Olivia Newton-John (Let’s Get Physical) Hint: Granddaughter of Max Born
4. The Police (Walking on the Moon)
5. Monty Python or Eric Idle (The Galaxy Song)
6. Oasis (She’s Electric)
7. Big Audio Dynamite (E = mc²)
8. Coldplay (The Scientist)
9. Moby (We’re all Made of Stars)
10. Barenaked Ladies (Big Bang)

ROUND 6 PICTURE ROUND (from The Big Bang intro pics)

1. 25 Prince Siddhartha
2. 26 Moses (1831 statue in the village of Santa Maria del Monte)
3. 26 Parthenon on the Acropolis
4. 31 Notre Dame de Paris
5. 34 Michelangelo’s David
6. 35 Leonardo’s Vitruvian Man
7. 40 Jean of Arc
8. 70 Ford Model T
9. 72 Theodore Roosevelt
10. 79 Jackson Pollock

All 109 The Big Bang Theory images at http://haraldkraft.de/thebigbangtheory/
ROUND 7 NEWS

1. Which singer joined Kian, Bressie, and Sharon as a coach on the latest *Voice of Ireland* singing competition?
   - Jamelia

2. What did Research in Motion rebrand itself as, changing their name to their best-known product?
   - Blackberry

3. Who is the current president of Syria?
   - Bashar al-Assad

4. Who is the Argentine cardinal who became Pope Francis I?
   - Jorge Mario Bergoglio

5. What is the capital of Cyprus?
   - Nicosia

6. What is the capital of North Korea?
   - Pyongyang

7. Who won the 2013 Australian Grand Prix, the initial Formula 1 race of the year?
   - Kimi Raikkonen (Lotus)

8. Who signed a 10-year, $250-million sponsorship deal with Nike in January?
   - Rory McIlroy

9. Once called the “Baron of Ballsbridge,” which Irish businessman has filed for bankruptcy in the United States, claiming liabilities of over $500 million?
   - Sean Dunne

10. Who was appointed the new manager of the Sunderland Football club?
    - Paolo Di Canio
1. What is the largest country by land mass?
   Russia

2. Which is the largest island in the Caribbean?
   Cuba

3. What is the longest river in Asia?
   The Yangtze River

4. Through how many countries does the equator pass in Africa?
   6 (Gabon, Congo, DR Congo, Uganda, Kenya, Somalia)

5. To which country do the Galapagos Islands belong?
   Ecuador

6. Between which two lakes does Niagara Falls flow?
   Lake Erie and Lake Ontario

7. What is the name of the river that flows through Lisbon?
   The Tagus River

8. Which is the northernmost country of South America?
   Colombia

9. Which country is entirely surrounded by the Republic of South Africa?
   Lesotho

10. In which sea would you find the island of Ithaca?
    Ionian Sea
ROUND 9 NUMBERS

1. If the odds of winning any single rugby match are 50-50, what are the odds that Ireland wins 1 Six Nations game in any given year?

$$\frac{5}{32} \cdot \left(\frac{\binom{5}{4}}{2^5}\right)$$

2. What is $\tan^{-1}(1) \times 4$?

3.14159 (or pi, used as a computational means to calculate pi)

3. How many p-shell electrons are in the halogens?

5

4. What is the number of regular pentagonal faces in a dodecahedron divided by the number of Irish-born U2 members?

6 (12/2)

5. How many people are there in the two boats for the annual Oxford Cambridge Boat Race on the Thames, dominated this year by the Oxford Blues?

18 (8 oarsmen and 1 coxswain in each of two boats)

6. What is the atomic number of plutonium?

94

7. How many deputies are there in Dáil Éireann?

166

8. How many watts are in 1 horsepower?

746 watts

9. What is the sum of whole numbers from 1 to 100?

5,050 (50 \times 100 + 50)

10. What is a googol?

$10^{100}$ (1 followed by 100 zeros, aka ten duotrigintillion or ten thousand sexdecillion)
1. Born in Sicily in 287 BC and considered the greatest mathematician of antiquity, I accurately measured pi and famously said “Give me a lever long enough and a fulcrum on which to place it, and I shall move the world.”

Archimedes

2. Born in Edinburgh in 1550, I made use of the decimal point, discovered logarithms, and have a university there named after me.

John Napier

3. Born in Skreen County Sligo in 1819, I made contributions to fluid mechanics and optics and was Lucasian professor of Mathematics, Cambridge University for more than 50 years (the post first held by Newton).

George Gabriel Stokes

4. Born in Leighlinbridge, County Carlow 1820, I was the first to prove that the earth’s atmosphere had a Greenhouse Effect by showing that water vapour strongly absorbed infrared radiation.

John Tyndall

5. Born in 1845 in Lennep Germany, I discovered a new kind of ray and wrote the paper “On A New Kind Of Rays” (Über eine neue Art von Strahlen). I was awarded the first Noble prize in Physics in 1901.

Wilhelm Roentgen

6. Born in Worcester Massachusetts October 5, 1882, I was credited with creating and building the world's first liquid-fuelled rocket. My ideas were originally met with derision but I now have a Maryland NASA facility named after me.

Robert Goddard

7. Born in Somerset, England in 1917, I wrote such stories as *2001 A Space Odyssey*. My third law of prediction is “Any sufficiently advanced technology is indistinguishable from magic.”

Arthur C Clarke

8. Born in Petrovichi, Russia in 1920, I was a professor of biochemistry at Boston University and wrote popular science books. I coined the term ‘robotics’ in my 1941 story *Liar*.

Isaac Asimov


Dame Jocelyn Bell Burnell
10. We won the most recent Nobel Prize in Physics "for ground-breaking experimental methods that enable measuring and manipulation of individual quantum systems."

Serge Haroche and David J. Wineland
Ireland 2013 IOP Intervarsity Physic Quiz

Spot Prizes

Einstein

What were the topics of Einstein’s 4 famous 1905 papers (Photoelectric effect, Brownian motion, special relativity, mass-energy equivalence (E = mc²))

What did Einstein consider his biggest blunder (his cosmological constant)

What country asked Einstein to be its president (Israel)

Name the most Physics Nobel prize winners.

Name the most who have won American Idol, The X Factor, Britain’s Got Talent, or the Voice of Ireland?