

**MKULTRA II: A Fucking Didactic Educational .docx File**

**The Milton Keynes Ultimate Liaison of Trash and Academia**

**Edited by Emma Laslett, Ian Bayley, Hugh Bennett, Tristram Cole, Edmund Dickinson, Jonathan Elliott, David Knapp, David Stainer and Christopher Stern**

**Round 9 - Packet by Editors**

Tossups

**1. Name and regnal number required. One monarch of this name had earlier become Domnitor of the United Principalities after a palace coup in 1866. Another married Zita of Bourbon-Parma and was prevented in 1919 from returning to his country by law after renouncing participation in state affairs but not abdicating. A third monarch of this name was killed by a republican activist in 1908 along with his heir (\*) Luis who died twenty minutes later. Another was succeeded by his son Louis the Pious and crowned by Leo III on Christmas Day 800. For 10 points, give this name common to 20<sup>th</sup> century kings of Romania, Austria-Hungary and Portugal and an English king executed for high treason in 1649.**

ANSWER: Charles I [prompt on Charles or Charlemagne but do not accept any other regnal number]

**2. Christofk and Cantley discovered that the rate of this reaction process in tumours depends on the specific M2 splice isoform of PKM2; that study investigated the Warburg effect in which this process proceeds rapidly in cytosol. A protein fold consisting of eight alternating beta sheets and alpha helices is named for an enzyme in this pathway, which interconverts two three-carbon molecules at a (\*)**

**“catalytically perfect” rate. Triose phosphate isomerase acts on DHAP in this pathway, after which lactic acid fermentation can regenerate consumed NAD+. Aldolase breaks a carbon-carbon bond in this pathway that begins when hexokinase phosphorylates glucose. For 10 points, name this metabolic pathway that creates two pyruvate molecules as the first step of respiration.**

ANSWER: glycolysis [prompt on “respiration” until it is read; accept pyruvic acid dephosphorylation or pyruvate dephosphorylation until “in this pathway” is read]

**3. One song by this artist sees the narrator ponder “I don’t know why I let you kick in my “Do Not Disturb” sign / But I guess your mouth in motion got me so high”. As well as recording “Strawberry Bubblegum”, this artist featured on the Snoop Dogg single “Signs”, during the recording of which he discovered he had throat nodules. This artist appears on T.I.’s single (\*) “Dead and Gone” and this artist performed the single “Can’t Stop the Feeling!” during the interval at the 2016 Eurovision Song Contest. One of this artist’s best known tracks sees him claim “Your bridges were burned, and now it’s your turn” to do the title action, while another was the lead single from the album *FutureSex/LoveSounds*. “SexyBack” and “Cry Me a River” are, for 10 points, singles by which US artist?**

ANSWER: Justin (Randall) Timberlake

**4. One character created by this author says he has “been leading a double life – at least” after getting out of his wheelchair and taking off this moustache. In one play by this author, a man is offered a chocolate and asks for “Chateau Neuf du Pape ’55 Cracknell?” That man is later killed by Puckerage. In one play by this author a character says that “the practice of throwing one’s arms around a side of (\*) beef” is the definition of a carnal embrace. This creator of the theatre critics Moon and Birdboot set a play during two time periods in Sidley Park featuring the tortoise Plautus in every scene. This author of *The Real Inspector Hound* wrote about Thomasina Coverly and Septimus Hodge in one work. One play by this author begins with a character flipping a coin that comes up heads 92 times in a row. For 10 points name this author of *Arcadia* and *Rosencrantz and Guildenstern are Dead*.**

ANSWER: Tom Stoppard (Accept Tomáš Straussler)

**5. Between 1968 and their first major sponsorship deal, this was the predominant colour on McLaren racing cars. This colour does *not* appear in the uniform of one baseball team when they play home games at Comerica Park, despite being prominent on their logo, away uniform, and namesake animal. Miami**

**Gardens hosts a college playoff bowl named for this colour. This colour provides the most common nickname of a (\*) national team who beat the USSR in the final of the 1988 European Championships but who lost to Argentina in a 2014 semi-final as well as the final of the 1978 World Cup. This colour has superseded Old Gold as the predominant colour of Wolverhampton Wanderers. For 10 points, name this colour worn by the Dutch national football team.**

ANSWER: **orange** (accept **Orange Bowl**; accept **Oranje**)

**6. The first MP for London University was given this role in Gladstone's first cabinet, despite having opposed the 1866 Liberal Reform Bill; that holder of this role was Robert Lowe. While holding this role in the cabinet of Benjamin Disraeli, Stafford Northcote pursued the policies set out by his Liberal predecessor Gladstone. In this role, (\*) Randolph Churchill fought the demands of the War Secretary W.H. Smith and later claimed he had "forgotten Goschen" when he resigned from it. The sinking fund was re-established by holders of this role, and in this role under Lord Liverpool, Nicholas Vansittart's conduct was criticised by David Ricardo. For 10 points, name this government role that achieves the fair distribution of "misery" by setting taxes.**

ANSWER: **Chancellor** of the Exchequer

**7. A set of eight pieces for this instrument, clarinet and piano were composed by Max Bruch, as well as a double concerto for this instrument and clarinet. A concerto for this instrument with a movement titled *Zwischen Berg und tiefem Tal* was titled *Der Schwanendreher* and premiered by its composer (\*) Paul Hindemith, who also composed the *Trauermusik* suite for this instrument. The *allegro frenetico* last movement of one work for this instrument is interrupted 12 bars in by an *Adagio* 'reminiscence of the introduction.' That movement was entitled *Orgie de Brigands* and comes from a Berlioz work which was commissioned by Paganini and inspired by a Byron poem, *Harold in Italy*. For ten points, name this alto clef-using string instrument, which is pitched a fifth below the violin.**

ANSWER: **Viola**

**8. One building in this city was rebuilt twice in quick succession, the second time because it was considered 'sarkari' rather than 'akal', and it is the seat of the highest-ranking Jathedar. One Hindu temple in this city is known for its elaborate silver doors, although it is unclear whether its colloquial name is derived from this, or from its proximity to another, more well-known building. The most famous building complex in this city contains three sacred trees, or (\*) *bers*, including one where an unnamed leper was cured, and its central feature has four entrances, symbolising openness and acceptance, and is surrounded by the Sarovar, a lake of holy water from which this city takes its name. For 10 points, name this city in Punjab, home to the Harmandir Sahib, or 'Golden Temple', the spiritual centre of Sikhism.**

ANSWER: **Amritsar**

**9. A popular folk etymology holds that the phrase "cock-and-bull story" originates from the names of a pair of coaching inns in this town. A clock in the shape of a frog blowing bubbles can be found in another of this town's buildings, which is claimed to be the longest shopping centre in the world. This town is home to the UK's first (\*) multiplex cinema as well as its first purpose-built ecumenical church, the Church of Christ the Cornerstone. In 1978, Canadian artist Liz Leyh used scrap building materials to create the iconic *Concrete Cows* sculpture in this town, which is also known for its grid layout and numerous roundabouts. For 10 points, name this large "new town" in Buckinghamshire, where you are currently listening to this question.**

ANSWER: **Milton Keynes** [accept **Stony Stratford** before "frog" is read]

**10. One poem by this author calls for a dying lover to be "suspended / above Mortality" and states "That you, who were Existence / Yourself forgot to live." This author wrote that "'Twas lighter – to be Blind" in a poem about "A Threadless way". In one poem by this author "the Landscape listens / Shadows – hold their breath". That poem by this author describes the title concept "That (\*) oppresses, like the Heft of Cathedral Tunes". This author of *From Blank to Blank* wrote one poem where "The Stillness in the Room / Was like the Stillness in the Air / Between the Heaves of Storm." and another about a Carriage which "held but just**

Ourselves / and Immortality.” *There’s a certain Slant of light* is for 10 points by which author of *I heard a Fly buzz - when I died* and *Because I could not stop for Death*.

ANSWER: Emily Elizabeth Dickinson

11. One poem shows this woman being accosted on the way to the afterlife by a giantess, who criticises her for breaking oaths and causing the deaths of heroes. This woman was once known as Sigrdrifa, or ‘Victory-bringer’, although she lost this name after helping King Agnar win a battle. This woman’s fiancé proposed to her with the cursed ring (\*) Andvaranaut, though he later took it back after sleeping with a sword between them for three nights, while disguised as Gunnar. This woman’s father imprisoned her in a castle on top of a mountain, surrounded by both a wall of shields and a ring of fire that could only be crossed by a man without fear. For 10 points, name this shieldmaiden and valkyrie, who was cursed by Odin to live a mortal life, and fell in love with the hero Sigurðr.

ANSWER: Brynhildr [accept Brunhild or Brünnhilde]

12. One short story by this author is set in a world where homosexuality is the norm and heterosexuality an aberration. Another of their stories is about Vernon, who keeps a catalogue of his sexual activities with his wife before starting an affair with himself and taking up masturbation instead. In a novel by this author, Grace’s dementia causes her to reveal that she has been committing incest with her grandson. The lottery-winning title character of that novel feeds (\*) tabasco sauce to his pit bulls to keep them vicious. This author, who wrote about the amnesiac Mary Lamb in *Other People*, wrote a novel narrated by a dying writer about the ‘murderer’ Nicola Six and the paedophile darts player Keith Talent. This author of *Lionel Asbo* and *London Fields* wrote a novel about a German Holocaust doctor that is told backwards. For 10 points name this author of *Time’s Arrow* who wrote about John Self in *Money*.

ANSWER: Martin Amis (prompt on Amis)

13. The Kawasaki identity follows from an extension to this law that sets a ratio of probabilities of dissipation functions equal to an exponential. That fluctuation theorem, which gives the probability that this law can be microscopically violated, was introduced by Searles and Evans to deal with a objection that this statement is inconsistent with time symmetry put forward by Johann (\*) Loschmidt in response to Boltzmann’s *H*-theorem. Another version of this law states that the change in heat energy from a reservoir at constant temperature is always greater than or equal to zero, and was formulated by Clausius. This law limits the efficiency of the Carnot cycle. For 10 points, which law that states that the entropy of a non-ideal isolated system will always tend to increase?

ANSWER: Second law of thermodynamics [accept fluctuation theorem before it is read]

14. Swedish House Mafia member Axwell released a solo track of this name in conjunction with Carlsberg’s “Where’s the Party?” campaign. A Galaxy Reactor at this general location is accessed from Comet Observatory and is the location of the Bowser boss fight in *Super Mario Galaxy*. A planet located here was destroyed in a battle between Kyle Rayner and Hal Jordan, two Green Lanterns; that location is Oa in DC Comics. A three-torus (\*) cosmological model has been proposed to account for the non-observation of this location. Salvador Dalí argued that this location is the railway station in Perpignan. Geocentric models define the Earth as, for 10 points, what notional location that should not be confused with the spatial origin of the Big Bang?

ANSWER: centre of the universe (or Center of the Universe; accept centre of the world after “geocentric”)

15. During the 71st iteration of this event, one participant resorted to cannibalism, and was subsequently killed by an artificial avalanche. The 75th and last iteration of this event was interrupted before completion thanks to a redirected lightning strike. Competitors trained for this event are known as (\*) ‘Careers’, and include Enobaria, Cato, and Finnick Odair. Every 25th iteration of this event has altered rules, and is known as a ‘Quarter Quell’ - the winner of the second of these was Haymitch Abernathy. For 10 points, name this recurring event, held annually in the nation of Panem, the 74th of which were won jointly by Peeta Mellark and Katniss Everdeen, consisting of a fight to the death between 24 teenage ‘Tributes’.

ANSWER: The Hunger Games

16. This artwork shares its theme with a sculpture of a skeleton in a dress by René Iché. The development of this artwork was documented by a series of photographs that reveal the artist's replacement of the sun with a bare light bulb. One woman towards the centre of this artwork seems to float through a window while carrying a flaming lamp. Dora (\*) Maar photographed this work, whose right-hand side shows a woman trapped above and below by fire. A dead soldier bearing stigmata holds a broken sword and flower in this painting, whose focus is a gaping wound in the side of a horse with a spiked tongue, screaming next to a bull. For 10 points, name this painting extending over more than 20 feet of black, white and grey, a depiction of a 1937 bombing by Pablo Picasso.

ANSWER: Guernica

17. During one coup in this country, the Revolutionary Command Council for National Salvation abolished political parties and opposed secular practices in the judiciary. One rebel leader in a civil war in this country died in a helicopter crash three weeks after becoming its vice-president on the cessation of hostilities; that leader was secessionist John Garang. One early nationalist leader in this country, Ismail al-Azhari, was supported by the Khatmiyya brotherhood and the (\*) Egyptian government; as president, al-Azhari was deposed by Gaafar Nimeiry, who later violated the Addis Ababa Agreement by imposing Sharia law here in 1983. A 1989 coup installed Omar al-Bashir as leader of, for 10 points, what African country from which the non-Muslim south gained independence in 2011?

ANSWER: (Republic of the) Sudan (or Jumhūriyyat as-Sūdān; do not accept or prompt on "South Sudan")

18. One type of mathematical object with this name is defined as a sequence of simplicial sets in which each is connected to the suspension of the previous one by a structure map. Those objects are studied in stable homotopy theory and may be used to represent generalised cohomology theories. In algebraic geometry, another type of object with this name is commonly augmented with a structure sheaf and the Zariski topology and consists of the (\*) prime ideals of a given ring. A third mathematical structure with this name is defined for a bounded linear operator  $T$  as the set of all  $\lambda$  such that " $\lambda I$  minus  $T$ " is not bijective, generalising the discrete set of eigenvalues of a finite-dimensional matrix. For 10 points, what term is also used in physics to describe the full range of known wavelengths and frequencies of electromagnetic radiation?

ANSWER: spectrum [or spectra]

19. Diodorus Cronus led an offshoot of the Megarian school named for this philosophical concept. This concept titles the second great treatise by Peter Abelard, while the title of a work which introduced the term "culture industry" and was written by Max Horkheimer and Theodor Adorno applies this concept to the enlightenment. In the title of a work trying to reconcile his existentialism with Marxism, (\*) Sartre critiques this form of reason. A passage titled "Lordship and Bondage" introduces the master-slave form of this concept and appears in *The Phenomenology of Spirit* by a thinker associated with this concept, Georg Hegel. For 10 points, which form of reasoning consists of a thesis, then its antithesis, and then a synthesis between the two?

ANSWER: Dialectic (accept dialectical, but do not accept 'dialect')

20. 2013 saw the failure of this country's ITT initiative, which had proposed voluntary non-extraction of fossil fuels in exchange for international development funding to protect its Yasuni National Park; that region close to the Napo river in this country is sometimes claimed as the most biodiverse location on Earth. Sangay National Park in this country contains the highly active volcano of Tungurahua. This country shares with its southern neighbour the Cordillera del (\*) Cónдор mountain range. The Cayambe volcano is close to the capital of this country, where an April 2016 earthquake caused damage in the port of Guayaquil [gwah-yuh-KEEL]. The most distant mountain summit from the centre of the earth, Chimborazo, is located in, for 10 points, what country that also owns the Galápagos Islands?

ANSWER: (Republic of) Ecuador



## Bonuses

1. In this novel Pao-yu has a wet dream about the 'Supplementary Secondary Record of the Twelve Girls of Chin Lang', and then loses his virginity to the servant girl who changes his clothes. For 10 points each:

[10] Name this novel about the rise and fall of the two branches of the Jia clan.

ANSWER: **Dream of the Red Chamber** (Accept *The Story of the Stone*; **Dream of Red Mansions**; **Hong lou meng**).

[10] Another of the Four Great Classical Chinese Novels is the *Romance of the Three Kingdoms*, which is attributed to this author.

ANSWER: **Luo** Guanzhong

[10] Guanzhong may have also edited parts of this novel about 108 bandits.

ANSWER: *The Water Margin* (Accept **Outlaws of the Marsh**, **All Men are Brothers**, **Shui Hu Zhuan**)

2. Novelist Alan Garner's curiosity in an oak shovel in his old primary school led to the discovery in the 1990s that it was a 4,000-year old relic of Bronze Age copper mining. For 10 points each:

[10] That shovel was found at this escarpment south of Wilmslow in Cheshire.

ANSWER: **Alderley Edge**

[10] Copper mining in Cornwall and at Alderley Edge was displaced in the late 18<sup>th</sup> century, when the largest copper mine in Europe was dug at Parys Mountain near Amlwch [AHM-lukh], on this island across the Menai Strait from mainland Wales.

ANSWER: **Anglesey** (or **Ynys Môn**)

[10] Disused copper mineshafts dot fells such as Wetherlam and Swirl How in this group of fells in the Lake District.

ANSWER: **Coniston** Fells (or **Coniston** Massif or **Furness** Fells)

3. When Ilse Dörffeldt committed this mistake at the 1936 Berlin Olympics, it caused Hitler to thump his leg in frustration. For 10 points each:

[10] Name this sporting error also committed by Briton Darren Campbell at Atlanta 1996.

ANSWER: **dropping** the **baton** in the 4 × 100 m relay (accept any answers containing the word **baton** and the notion of its not being carried by the sprinter)

[10] Great Britain took gold in the European Championships in 2002, but were stripped of the gold medal after this sprinter, who had also won the 100 m, tested positive for the steroid THG.

ANSWER: Dwain (Anthony) **Chambers**

[10] This team holds the world record for the men's 4x100m relay; in the final at London 2012 they became the first team to break the 37 seconds barrier.

ANSWER: **Jamaica**

4. In July 1984, the New York Times raised questions about the finances of this woman's real estate developer husband, John Zaccaro. For 10 points each:

[10] Name this Italian-American politician who promised that her husband's tax returns would be released.

Unfortunately, he refused to do so and she tried to laugh it off by joking "you know what it's like" to be married to an Italian man.

ANSWER: Geraldine **Ferraro**

[10] Geraldine Ferraro was the running mate of this Minnesota-born former Vice President, who only managed to win his home state and the District of Columbia for the Democratic Party in the Reagan landslide of 1984.

ANSWER: Walter **Mondale**

[10] St Paul, Minnesota was the site of the Republican National Convention that chose this woman to be its Vice Presidential candidate.

ANSWER: Sarah **Palin**

5. Sometimes two famous people have similar enough names that they would make for ambiguous quiz answers. Name some of them, for 10 points each.

[10] What two names are shared by two contemporary Pulitzer Prize-winning composers, one of whom is distinguished by the middle name “Luther”? The second and sixth presidents of the United States also share these same two names, one being distinguished by the middle name “Quincy”.

ANSWER: John Adams [prompt on partial answers]

[10] What two names are shared by the men’s winners of the 800 metres and the 3000 metres steeplechase at the 1997 World Championships in Athletics?

ANSWER: Wilson Kipketer [Wilson Boit Kipketer] [prompt on partial answers]

[10] What two names are shared by the presenter of *Supersize vs Superskinny*, and by an interior designer who appeared on *Changing Rooms*?

ANSWER: Anna Richardson [Anna Ryder Richardson] [prompt on partial answers]

6. In this novel a woman eats dog muck in order to win a bet and get money to spend on alcohol. For 10 points each:

[10] Name this novel in which Gervaise marries Coupeau on a rainy day when the wedding party shelter in the Louvre.

ANSWER: L’Assommoir (Accept The Drinking Den)

[10] *L’Assommoir* is by this author who wrote about Gervaise and Coupeau’s daughter *Nana* in another of the novels in his Rougon-Macquart cycle.

ANSWER: Émile Édouard Charles Antoine Zola

[10] In this other Zola novel, Gervaise’s son Jacques Lantier is an engine driver with a mania for murdering women.

ANSWER: La Bête humaine (Accept The Human Beast, The Beast Within, The Beast in Man)

7. This movement helped to popularise “synthpop” and its look was heavily influenced by the designs of fashion boutique Kahn & Bell. For 10 points each:

[10] Name this pop culture and music scene of the late ‘70s and early ‘80s that was centred on bands such as Spandau Ballet and Duran Duran.

ANSWER: New Romanticism (accept Blitz Kids)

[10] One of the earliest New Romantic singles to be a hit was this debut single Spandau Ballet, about a veteran soldier suffering from post-traumatic stress disorder.

ANSWER: ‘To Cut a Long Story Short’

[10] As well as being members of Ultravox, Billie Currie and Midge Ure were also members of this synthpop band who were heavily associated with New Romanticism. This band’s biggest single was the 1980 top ten hit “Fade to Grey”.

ANSWER: Visage

8. Together with the Lorentz force law, these equations underpin classical electrodynamics. For 10 points each:

[10] Name this set of four partial differential equations, which describe how the electric and magnetic fields interact with currents and charges. They are named for the Scottish physicist who introduced them.

ANSWER: Maxwell’s equations

[10] The differential form of Gauss’s law for magnetism, one of Maxwell’s equations, states that this function of the magnetic field is always zero through a closed surface, implying that magnetic monopoles do not exist.

ANSWER: divergence [accept descriptions such as “del dot”]

[10] Maxwell’s equations are fully compatible with relativity. The usual relativistic formulation involves applying this operator to the 4-potential. Symbolised by a square, this is the Laplace–Beltrami operator for Minkowski space.

ANSWER: d’Alembertian operator [or wave operator]

9. This is the second bloodiest war of any kind, exceeded in casualties only by the Second World War. For 10 points each:

[10] Name this civil war which began when Hung Hsiu-chuan fell into a trance after failing his civil service examinations and was inspired by visions of heaven to cast out the Manchus.

Answer: The **Taiping Rebellion**

[10] The Taiping Rebellion was led by Hong Xiuquan who claimed to be this relative of this famous person. You need both parts.

ANSWER: younger **brother** of **Jesus** Christ

[10] This American sailor and soldier of fortune created the Ever Victorious Army, which was later commanded by General Gordon.

ANSWER: Frederick Townsend **Ward**

10. Now for some bonuses on some of the most notable games of 2015, according to *Zero Punctuation*'s Ben 'Yahtzee' Croshaw. For 10 points each:

[10] Yahtzee's pick for 2015's worst game was *The Order:1886*, described as "utterly inconsequential...like a birthday card tied to an unsecured balloon", in which the Knights of The Round Table fight vampires, werewolves and this serial killer, reimagined as the vampire Lord Hastings, in steampunk London.

ANSWER: **Jack the Ripper** [prompt on partial answers]

[10] The Blandest Game of 2015 was *Guardians*, the fifth instalment of this franchise described by Yahtzee as "incredibly repetitive sci-fi shooter garbage with pseudo-mythical pretensions with the emphasis on 'pretensions'".

ANSWER: **Halo**

[10] After setting the rule that all games selected had to be ones he had reviewed, Yahtzee cut to a review stating simply that this game "is a good game", before picking this deconstructionist pixel-art RPG by Toby Fox as the best game of 2015.

ANSWER: **Undertale**

11. Sculptures of the Cornaro family are positioned in boxes to observe this artwork in a chapel of the church of Santa Maria della Vittoria. For 10 points each:

[10] Name this sculptural group whose title figure is stood over by an angel holding a golden spear.

ANSWER: *The **Ecstasy of Saint Teresa*** (or *L'**estasi di Santa Teresa***)

[10] This Italian sculptor of *The Ecstasy of Saint Teresa* also created the *Fountain of Four Rivers* under an obelisk in Rome's Piazza Navona.

ANSWER: Gian Lorenzo **Bernini**

[10] In Bernini's decorations for the Chigi [KEE-ghee] Chapel in Santa Maria del Popolo, a sculpted angel bursts from a niche with an outstretched arm while pulling the hair of this prophet, who will take food to Daniel in the lion's den.

ANSWER: **Habakkuk** (accept **Habakkuk and the Angel**)

12. In one story, he flew to the sun and tried to speak to it, but only burnt his tongue. For 10 points each:

[10] The Maya deity Kukulcan is also sometimes depicted as the sun god's pet, and is this particular kind of animal, a form he shares with the K'iche' god Q'uq'umatz and the Aztec Quetzalcoatl.

ANSWER: **Feathered Serpent** [prompt on partial answers, accept clear-knowledge equivalents, accept 'snake' for 'serpent']

[10] Another Maya animal deity was Vucub Caquix, who assumed the form of this bird and pretended to be the sun and moon, until he was shot and robbed blind by the Hero Twins and died of shame.

ANSWER: **Macaw**

[10] The Hero Twins did this kind of thing a lot: in one story, they get revenge on their stepbrothers for leaving them on an anthill to die by turning them into these animals. However, in earlier Mayan myths, the gods personified as these animals were depicted as patrons of the arts who may have created mankind.

ANSWER: **Howler monkeys** [prompt on 'monkey']

13. This quantity is an eigenvalue of the Hamiltonian in the time-independent Schrödinger equation. For 10 points each:



[10] Name this quantity, which is quantised into regularly spaced levels proportional to  $(v+1/2)$  [“vee plus one half”] for a quantum harmonic oscillator.

ANSWER: **energy** [accept **energy levels**]

[10] This scientist approximated the Hamiltonian for conjugated pi electron systems by setting off-diagonal interactions to zero except between neighbouring atoms; that theory led to his prediction of the  $4n+2$  (“four en plus two”) rule for aromaticity.

ANSWER: Erich (Armand Arthur Joseph) **Hückel**

[10] In the Hückel approximation, evaluating this quantity and setting it equal to zero ensures a non-trivial solution and constructs a polynomial equation for the energy levels. In the Rayleigh–Ritz method, this quantity arises when interpreting its namesake system of equations as a matrix.

ANSWER: **secular determinant** [prompt on “determinant”; do not accept or prompt on “secular equations”]

14. Now for some bonuses on a famous legal decision. For 10 points each:

[10] Associate Justice Harry Blackmun’s summing up of the court’s decision in this case stated that women had the right to access to an abortion “free of interference by the State”.

ANSWER: **Roe v. Wade**

[10] Henry Wade defended the case as a representative of this state, in whose second-largest county he was serving as District Attorney.

ANSWER: **Texas**

[10] This woman took the pseudonym ‘Jane Roe’ as plaintiff in the *Roe v. Wade* case. She later notably changed her views on abortion, and is now active in the pro-life movement.

ANSWER: Norma Leah **McCorvey**

15. This 5 foot 6 inch football player set up Aaron Ramsey for his goal against Russia at Euro 2016 with a pass described as “threaded through the eye of a needle”. For 10 points each:

[10] Name this “Welsh Xavi” who enjoys a weekly Appreciation Day, and was signed by Stoke City from Liverpool in summer 2016.

ANSWER: (Joseph Michael) “Joe” **Allen**

[10] Another short man was scientist-astronaut “Little Joe” Allen who served in the CAPCOM role in NASA Mission Control during this mission. In this mission, David Scott and Jim Irwin drove the first Lunar Roving Vehicle, but also tarnished NASA’s reputation by taking to the moon unauthorised postage stamp covers for later sale.

ANSWER: **Apollo 15**

[10] Another Joseph Allen was a playable character in the second *Modern Warfare* instalment of this first-person shooter series, during a segment in which the player participates in a massacre of civilians in a Moscow airport.

ANSWER: **Call of Duty**(: *Modern Warfare 2*) (accept **COD**)

16. In 1915, mismanagement by the British government caused the army to run short of high explosive shells on the Western Front. For 10 points each:

[10] This commander-in-chief of the British Expeditionary Force used his journalist friend Charles Repington to leak details of the shell shortage to the press; he later resigned in favour of Douglas Haig after the failure of the Battle of Loos.

ANSWER: Sir John (Denton Pinkstone) **French**

[10] French feuded with this field marshal and Secretary of State for War, who was attacked in the *Times* and the *Daily Mail* over the shell shortage. This hero of Omdurman was drowned when *HMS Hampshire* sunk in 1916.

ANSWER: Horatio Herbert **Kitchener**, 1<sup>st</sup> Earl Kitchener (accept Lord **Kitchener**)

[10] This owner of both the *Times* and the *Daily Mail* used his papers to attack the Asquith government, advocating the creation of a Ministry of Munitions.

ANSWER: Alfred (Charles William) **Harmsworth**, Baron **Northcliffe** of the Isle of Thanet (accept either underlined answer; accept Lord **Northcliffe**)

17. One of these entities was the lion-man Narasimha, who killed the asura king Hiranyakashipu by exploiting a whole series of loopholes. For 10 points each:

[10] Name these entities, who also include the fish-man Matsya, the tortoise Kurma, and the boar Varaha.

ANSWER: Avatars of Vishnu [prompt on partial answers, accept Dashavatara]

[10] Parashurama, the sixth of the Dashavatara, is generally depicted as a brahmin carrying this weapon, which helped him wipe out the kshatriya twenty-one times.

ANSWER: Axe [accept parashu]

[10] This eighth member of the Dashavatara is popular as a god in his own right, and appears as a flute-playing cowherd in the *Bhagavata Purana* and Arjuna's charioteer in the *Mahabharata*.

ANSWER: Krishna [accept Gopala, Govinda, Hari, Narayana or Prajapati]

18. This character tells his slave Ithamore, "I walk abroad a-nights / And kill sick people groaning under walls. / Sometimes I go about and poison wells"... For 10 points each:

[10] Name this wealthy merchant who poisons a whole nunnery to kill his daughter Abigail and eventually dies being boiled alive in a cauldron.

ANSWER: Barabas (Accept The Jew of Malta)

[10] *The Jew of Malta* is by this author of the two parts of *Tamburlaine the Great* and *Doctor Faustus*

ANSWER: Christopher Marlowe

[10] These four words complete the quotation from *The Jew of Malta*. "Thou hast committed - 'Fornication: but that was in another county, / And besides..."

ANSWER: The wench is dead

19. Some species appear to violate this ecological principle through resources partitioning, sometimes called "the ghost of competition past". For 10 points each:

[10] Identify this principle which states that no two species competing for the same limited resources can coexist in the same space.

ANSWER: competitive exclusion principle or Gause's Principle

[10] G. F. Gause first formulated the competitive exclusion principle following his studies of two species of this genus of protists.

ANSWER: Paramecium

[10] These organisms appear to violate the principle of competitive exclusion. Defined by their ecological niche rather than taxonomy, these organisms compete for light and minerals in large bodies of water.

ANSWER: phytoplankton

20. Vaughan Williams composed a fantasia on a theme by this composer, for 10 points each:

[10] Name this British composer, whose student William Byrd wrote *Ye Sacred Muses* to commemorate his death.

ANSWER: Thomas Tallis

[10] Tallis is probably best known for composing this 40 part motet, whose text is taken from the Sarum rite, adapted from the Book of Judith.

ANSWER: Spem in alium

[10] *Spem in alium* is thought to have been inspired by either *Ecce beatem* [bae-ar-tem] *lucem* or *Missa sopra Ecco si beato giorno*, both by this Italian composer.

ANSWER: Alessandro Striggio