

OOT 2017
FINALS 1 - Editors 9

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Questions also written by Eric Mukherjee, Thomas De Bock, Isaac Brown.

This packet should be read as the first finals round

Tossups

1. **In one drawing, this figure's head is grafted onto the body of a Swedish street installation known as a "roundabout dog." In a Gustave Dore depiction of this figure, two clothed figures stand atop an escarpment looking as this man pulls his chest open. Hilye pages predominantly represent this figure and one depiction prompted the publication of a photograph of (*) Jacques Barrot in a pig-squealing competition-. Stéphane Charbonnier was shot after depicting this figure saying "100 lashes if you don't die of laughter". For 10 points, name this prophet who was depicted with a sign saying "Je Suis Charlie" after a terrorist attack on a crass French magazine.**

ANSWER: Muhammad^{PBUH}

2. **N-Chlorosuccinimide [claw-o-sucks-in-im-ide] activates a dimethyl compound of this element for the Corey-Kim oxidation. The centre of Lawesson's reagent is a ring of phosphorus and this element. Alcohols can be oxidised by Oxalyl Chloride and a dimethyl oxide of this element in a reaction named for Swern. The Jones oxidation uses an (*) acid containing this element, which is formed by the lead chamber and contact processes. Its most common allotrope is a ring of eight atoms in a "Crown" conformation. Added to rubber in vulcanisation, For 10 points, name this group 16 element found below Oxygen on the periodic table.**

ANSWER: Sulfur [prompt on S before mention]

3. **The speaker of this work says "You understand me: I'm a beast, I know," and describes how he lived "On fig-skins, melon-parings, rinds and shucks". In this poem, a character claims that the "white smallish female with the breasts" is his niece, and confuses Salome with her father. This poem about the role of verisimilitude in art has the speaker told to (*) "Paint the soul, never mind the legs and arms!", and he complains that he can't "say there's beauty with no soul at all". This poem ends with a "grey beginning" and the conclusion that a "pretty picture" has been painted. For 10 points, name this Browning poem which has as its subject a fifteenth-century monk and painter.**

ANSWER: "Fra Lippo Lippi"

4. *Description acceptable.* **Francesco Gullino was probably responsible for the successful completion of this action after two previous failures. One suggested method for performing this action would have used a jelly supplied by the KGB. The subject of this event was targeted for works like *The Truth that Killed*, which criticized (*) Todor Zhivkov. That man only became aware of this event on reaching the offices of the BBC World Service, when he discovered a red pimple on his thigh. For 10 points, name this action, committed on 7 September 1978 in London by an associate of the Bulgarian secret police, using a ricin pellet injected by umbrella.**

ANSWER: the assassination of Georgi Ivanov Markov [accept anything to do with the death or killing of Markov; prompt on partial answers]

5. **In the mythology of the Philippines, the first people, Malakas and Maganda, emerge from some of this substance splitting in half. A Vietnamese tale tells of a man who is called upon by Buddha to find some of this with 100 knots to win a bride. In China, the spotted variety of this substance emerged when it was stained by the bloody tears of the wives of Emperor Shun. In the (*) oldest Japanese prose narrative, a man consistently finds gold in this plant after finding the moon princess Kaguya in a shining piece of this plant. For 10 points, Krishna normally holds a *basunari* flute made from the wood of what rapidly growing Asian plant?**

ANSWER: bamboo

6. This man's epitaph "Call me Trim Tab" is derived from an interview he gave to Playboy in 1972. He's not Adlai Stevenson, but this man popularised the term "Spaceship Earth", and was the second World President of Mensa. Signalling a commitment to the principles of rationality and efficiency in construction, a house, a map, and a car, among other things designed by this man, are prefaced by the word (*) "Dymaxion". He was associated with, and lived in, a hemispherical structure designed to be easy to assemble quickly. For 10 points, name this American architect and designer, after whom an allotrope of carbon is named.

ANSWER: Buckminster Fuller

7. This man died during a peace conference at Jassy, having earlier abandoned a plan to invade Persia, and he implemented his sovereign's policy of "Armed Neutrality." A long-time President of the College of War, this man's victory at Izmail inspired his country's first national anthem, and he oversaw the construction of the (*) Tauride Palace. This leader, who received the title "Prince of the Holy Roman Empire," was responsible for winning the second Russo-Turkish War and Russia's peaceful annexation of the Crimea. For 10 points, name this favorite of Catherine the Great, for whom he legendarily constructed his namesake ersatz villages.

ANSWER: Grigory Alexandrovich Potemkin-Tavricheski

8. One author from this country argued that the Enlightenment rejection of teleology has damaged the ethical project and that the critique of the "King Kamehamaha II of the European Tradition", Friedrich Nietzsche, could be combatted by a renewal of the Aristotelian school of ethics. Other than that author of (*) *After Virtue*, a thinker from this country created a thought experiment in which a judge has the option of framing one man or allowing five to be killed by a mob, a situation the author equated to being like the driver of a runaway tram, the so-called "Trolley Problem". For 10 points, name this home country of the authors Alasdair MacIntyre and Philippa Foot.

ANSWER: United Kingdom (accept Scotland before "framing", anti-prompt afterwards)

9. A general sits on a pyramid of skulls in "An Available Candidate," a cartoon satirizing the political aftermath of this conflict, during which William B. Ide launched the Bear Flag Revolt. The Kearny Code was a temporary legal structure for territory conquered in this war. One government's refusal of a secret offer by (*) John Slidell to buy territory near the Nueces River was a justification for this conflict, which saw major victories for Winfield Scott at Veracruz and Zachary Taylor at Buena Vista. Ended by the Treaty of Guadalupe Hidalgo, for 10 points, this is what 1846–48 conflict, a product of James K. Polk's politics of Manifest Destiny?

ANSWER: Mexican-American War [accept word variants, accept "American Invasion of Mexico," "Intervención estadounidense en México," or "Guerra de Estados Unidos-México"]

10. Minor characters in this work include the wicked lawyer Zeezrom and Pachus, the leader of the "king-men," while other episodes are set in the city of Angola, the site of a major battle, and two different places called Bountiful. One character in this work uses a steel bow for hunting, which breaks just after his father, (*) Lehi, finds a compass called the Liahona. The title character of this work is a Nephite prophet-historian, and the frame story for this book claims that it was written in "Reformed Egyptian" on golden plates. For 10 points, name this text, attributed to the prophet Moroni and supposedly "translated into English" by Joseph Smith.

ANSWER: Book of Mormon [accept *Book of Alma* until "Angola"]

11. Nat King Cole added this instrument to his King Cole Trio to complement piano, guitar and double bass. Stan Kenton, included this instrument in his version of "The Peanut Vendor". Both those parts were played by Jack Constanzo who is called "Mr. [this instrument]". Oscar Sotlongo played a square version of this instrument in the Sexteto Habanero and this instrument, (*) central to *son* music, is smaller than the

related conga. The larger of these objects is called a *hembra* and the smaller a *macho* expressing male and female parts which are joined by a small wooden bridge. For 10 points, name these small twin hand-drums central to Afro-Cuban music.

ANSWER: Bongos

12. **One structure known by this name has, at its base, a time capsule containing, among other items, twelve photographs of the most attractive Englishwomen of the age and a bronze medal depicting that structure. Henry Honychurch Gorringer oversaw the transportation of another structure with this name that was given as a gift to the U.S.A. for its lack of involvement in its country of origin's politics. A structure on the Place de la (*) Concorde in Paris occasionally known by this name is more usually known as the Luxor Obelisk. For 10 points, give this name used for Egyptian obelisks located in Paris, New York, and London.**

ANSWER: Cleopatra's Needle

13. **H. L. A. Hart criticized one concept developed by a thinker from this country as 'needless duplication'; that concept the basic norm was outlined in *Pure Theory of Law*. It's not Britain but one thinker from this country argued that "making and matching" was central to the process of perception. That author of *Art and Illusion* argued that "There really is (*) no such thing as Art. There are only artists." For 10 points, name this country home to the author of *The Story of Art*, Ernst Gombrich and Hans Kelsen who drafted a constitution used in Salzburg and Linz.**

ANSWER: Austria (accept Austria-Hungary)

14. **One of this man's protagonists is a man who prepares the name "Yogiura" in case Japan invades his European homeland. In a novel by this author, while spending her honeymoon on the Upper Plateau, Diana Vorpsis is captivated by a young man wandering during a month-long truce in a Kanun-regulated blood feud. This man created a town endlessly invaded and re-invaded, and an Italian general who collects the bones of soldiers from World War II. This man fictionalized the death of (*) Mehmet Shehu, a colleague of Enver Hoxha. For 10 points, name this author of *The Successor*, *Broken April*, *Chronicle in Stone*, and *The General of the Dead Army*, a Man Booker International winner from Albania.**

ANSWER: Ismail Kadare

15. **Franz Xaver Sussmayr wrote a C-major symphony named for this country. Paul Hindemith declined a professorship at this country's first musical conservatory but did take on the role of reorganising its musical education system. At the turn of the 19th century, pianos were manufactured with a "stop" named for this country that could be used to imitate a bass drum. The final movement of (*) *Beethoven's 9th* features a march in this country's style and Mozart drew inspiration from this country for his *5th Violin Concerto* as well as *The Abduction from the Seraglio*. Many classical era composers were inspired by, for 10 points, the Janissary bands of which country.**

ANSWER: Turkey

16. **The low entropy rate of this structure can be explained by background selection and deleterious, unopposed "hitchhiking effects". RecLOH events involving this structure do not require a second version of this structure. The first individual in haplogroup A00 was the first to (*) possess this structure. This structure is susceptible to Muller's ratchet as the conditions for its recombination never arise. This is demonstrated by the fact it has lost approximately 97% of its genetic material in the last 300 million years, but it still retains SRY; a gene important for sex determination. For 10 points name the smaller of the two human sex chromosomes.**

ANSWER: Y Chromosome

17. **The density of states multiplied by the square of the matrix element of the perturbation is proportional to the rate of nonradiative transitions according to a relation named for this man. Through-bond coupling in NMR is due to a contact interaction named for this scientist. In addition to a namesake**

(*) “Golden Rule,” this scientist names an energy, which is the maximum quantum state that particles in a system reach at absolute zero. With Dirac, this man names a distribution which describes the energies of his namesake particles with half integer spin. For 10 points, name this Italian-American physicist who developed the first nuclear reactor and has a particle physics laboratory named after him in Illinois.

ANSWER: Enrico **Fermi** [accept **Fermi’s Golden Rule** before “this man”]

18. This man collaborated with Jacques Roubaud, Edoardo Sanguineti, and Charles Tomlinson on *Renga*, and with Samuel Beckett on an anthology of his country’s poetry. One poem by this man tells the “lady of midnight,” “I travel your length like a river, I travel your body like a forest,” and another states, “Between seeing and making, contemplation or action, I chose the act of words.” He began one work “If to say ‘no’ to the world for now.” This poet of (*) “Solo for two voices” and “San Ildefonso Nocturne” wrote a 584-line work that begins “willow of crystal, a poplar of water,” and is based on the Aztec calendar. For 10 points, name this Mexican poet of “Sunstone.”

ANSWER: Octavio **Paz** Lozano

19. An object first used in this event was partially made in Beer and designed by William Dyce. In 2016, Robert Gainsborough bought one piece of memorabilia produced in this event for £1500 and Lord Belfast and the notable amputee Lord Uxbridge stood either side of the man who carried the sword of state at this event. The aftermath of this event was described as (*) “bliss beyond belief” by one participant, who wore a wreath of orange flowers. At this event, the Duke of Sussex gave away a woman wearing a Mary Bettans designed dress made with Honiton lace and, notably, white satin. For 10 points, name these nuptials of Edward VII’s parents.

ANSWER: **Wedding** of Queen **Victoria** and Prince Albert (prompt on **royal wedding**; accept word variants)

20. The presence of a persistent “overshooting top” which reaches the maximum parcel level indicates there is a greater likelihood that one of these phenomena will result. When these phenomena become surrounded by their RFD, they tend to elongate and “rope-out”. The wrapping of (*) precipitation around these phenomena may give rise to a characteristic “hook echo” on Pulse-Doppler radar. The strength of these phenomena are graded EF0 to EF5 on the Enhanced Fujita scale. By definition in contact with both the ground and a cloud base, for 10 points name these destructive rotating columns of air, often found in a namesake “alley” in the USA.

ANSWER: **Tornados**

Tiebreaker

21. One component of the parasitic form of this phenomenon has a magnitude proportional to its namesake coefficient, which is equal to the wall shear stress divided by the dynamic pressure. The non-existence of this phenomenon under certain conditions was unexplained for several decades, a situation known as d’Alembert’s paradox. Types of this phenomenon include wave, lift-induced and skin friction forms, and a falling object reaches terminal velocity when gravity is equal to the sum of this force and buoyancy. For 10 points, name this force which acts on a moving object in the opposite direction of its motion through a fluid.

ANSWER: **drag** [accept **air resistance** or **fluid resistance**, prompt on **friction** before mention]

Bonuses

1. Answer some questions about the poetry of that cheeriest of American authors, Emily Dickinson, for 10 points each:

[10] In this lyric poem, Dickinson contrasts the inability of “the purple Host / Who took the flag today” to understand victory with the knowledge of “he defeated - dying.”

ANSWER: “**Success is counted sweetest**” [accept number **112**]

[10] Death himself appears in this Dickinson poem, in which “He kindly stopped for me - / The Carriage held but just Ourselves - And Immortality.”

ANSWER: **“Because I could not stop for Death”** [accept number **712**]

[10] Dickinson’s poem on a dying one of these animals contains the unlikely line “His Mighty Balls – in death were thick.” Frank Baum wrote about a “hungry” one of these felines in *Ozma of Oz*.

ANSWER: **tiger** [or **Panthera tigris**]

2. Although The Times exposed this document as a forgery in 1921, it continued to be regarded as true by anti-Semites across the world, including Henry Ford and Nazi schoolchildren. For 10 points each:

[10] Name this text, supposedly the minutes of a meeting of the global Jewish conspiracy, first published in Russia in 1903.

ANSWER: **The Protocols of the Elders of Zion** [accept “**The Protocols of the Meetings of the Learned Elders of Zion**” or “**Programa zavoevaniya mira evreyami**”]

[10] Portions of the Protocols were plagiarized from the *Dialogue in Hell Between Machiavelli and Montesquieu*, a work by Maurice Joly advancing this royalist position, contrasted with the Orleanists and the Bonapartists.

ANSWER: **legitimist**

[10] The assassin of this German Jewish industrialist and politician may have thought he was an Elder of Zion. This man served as foreign secretary in the Weimar Republic, in which capacity he negotiated the Treaty of Rapallo.

ANSWER: Walter **Rathenau**

3. This piece opens with the 1st violin playing three ascending Gs, the last of which is accompanied by other members of the ensemble playing Gs in octaves. For 10 points each.

[10] Name this composition. Stravinsky claimed it was “an absolutely contemporary piece of music that will be contemporary forever”

ANSWER: **Grosse Fuge Op.133** [or **Great Fugue** or **Grand Fugue**]

[10] This composer originally wrote the *Grosse Fuge* as the final movement for his 13th string quartet, but later published it separately. He dedicated another three of his string quartets to Count Rasumovsky.

ANSWER: Ludwig van **Beethoven**

[10] The *Grosse Fuge*, piano sonatas 29 and 30 and this piece are said to contain Beethoven’s four late, great fugues. This choral piece followed an earlier setting of the same type in C major.

ANSWER: **Missa Solemnis** [prompt on **Mass in D Major**]

4. For 10 points each, answer the following on rappers sampling Indian tracks in their songs:

[10] This rapper who had a notable fight in a lift with his sister-in-law Solange [sol-anj] released a track called “Beware of the Boys” where he rapped over Punjabi MC’s Bhangra classic “Mundian to Bach Ke”.

ANSWER: **Jay-Z**

[10] “Addictive” by Truth Hurts ft. Rakim samples a track by this female playback artist, “the most recorded artist of all time”. Her sister Lata Mangeshkar overshadowed her in her early career and, in 1997, Cornershop released a tribute track to her.

ANSWER: Asha **Bhosle**

[10] This British-Tamil rapper of “Paper Planes” fame has used a number of Bollywood samples and was the first person of Asian descent to be nominated for an Oscar and a Grammy in the same year.

ANSWER: **M.I.A**

5. Mogadishu has frequently been a good place to make money. For 10 points each:

[10] Copper coins of Sultan Ali ibn Yusuf have been found as far away as Julfar in this modern day emirate, which borders Sharjah and is ruled by the influential al-Qasimi family.

ANSWER: **Ras al-Khaimah**

[10] Several copper coins bearing the Kaiyuan mark have been found near Mogadishu. This emperor who championed An Lushan and Li Po ruled during the Kaiyuan era; during his reign the Tang lost the Battle of Talas.

ANSWER: **Xuanzong** of Tang

[10] Some historians have remarked on the absence of the title of “sultan” shortly after the visit of this Arab traveller in 1322-23. This author of the *Rihla* gives his name to a shopping centre in the UAE.

ANSWER: Muhammad **Ibn Battuta**

6. *Culteranismo*, a portmanteau of the Spanish words for “cultivated” and “Lutheranism,” was one of the dominant, and most controversial, literary styles of the Spanish Golden Age. For 10 points each:

[10] An alternative name for *culteranismo* is derived from this man, the lifelong rival of Francisco de Quevedo, whose elaborate style is on display in works like the *Fable of Polyphemus and Galatea* and the *Soledades*.

ANSWER: Luis de **Góngora** y Argote [accept **gongorismo**]

[10] This later playwright moderated the excesses of *culteranismo* in *comedias* like his play about the Polish prince Segismundo, *La vida es sueño*.

ANSWER: Pedro **Calderón** de la Barca

[10] Francisco de Quevedo opposed *culteranismo* with the sharper, less intricate *conceptismo*, deployed in his novel *El Buscón*, a work in this genre about rogues and rascals, other specimens of which include *Lazarillo de Tormes*, *Gil Blas*, and *Simplicius Simplicissimus*.

ANSWER: **picaresque** [or **picaresca**]

7. The components of this work’s seat were manufactured in Poland and Czechoslovakia and its creation was supported by Bishop Dinis Sengulane. For 10 points each:

[10] Name this chair sculpture made by Kester and kept in the British Museum. It is mostly made up of guns from the former Eastern Bloc.

ANSWER: **Throne of Weapons**

[10] Most of the guns in *Throne of Weapons* come from this Soviet series of assault rifle, which appears crossed with a hoe in the flag of Mozambique.

ANSWER: **AK-47** [accept **Kalashnikov**]

[10] Carl Fredrik Reuterswärd created *Non-violence*, a sculpture of a gun with a knotted barrel in this medium. The British Museum holds the world’s largest collection of the art of the Edo people in this material.

ANSWER: **bronze**

8. The woman who coined this term drew on her experience with Anita Hill, who was encouraged to keep quiet by members of the African-American community to allow Clarence Thomas to be confirmed. For 10 points each:

[10] Give this term coined by Kimberle Crenshaw to describe the way that multiple minority identities interact to compound oppression.

ANSWER: **intersectionality**

[10] The concept of intersectionality was used in *Black Feminist Thought*, a book by this sociologist, who described the “matrix of domination” as “the overall organization of hierarchical power relations for any society.”

ANSWER: Patricia Hill **Collins**

[10] Collins argues that the historical portrayal of Sarah Bartman, the so-called “Hottentot Venus,” foreshadows the present portrayal of black women in this industry, described as “Men Possessing Women” in the title of a book by Andrea Dworkin who campaigns against it.

ANSWER: **pornography**

9. This author, obviously not expecting the oeuvre of poets Lindsay or St. Vincent Millay, wrote that “Pure reason and dispassionate truth would be perfectly ridiculous in verse, as we may judge by versifying one of Euclid’s demonstrations.” For 10 points each:

[10] Identify this author of *The Four Ages of Poetry*, who wrote the novels *Gryll Grange*, *Maid Marian*, and *Melincourt*, in which an Orang Utan is elected to Parliament.

ANSWER: Thomas Love **Peacock**

[10] Peacock is perhaps better known for this novella mocking the Romantic movement. Like his novels *Headlong Hall* and *Crochet Castle*, much of the text is satirical dialogue, in this case centred on the philosophies of the Toobad and Glowry families.

ANSWER: *Nightmare Abbey*

[10] Scythrop Glowry is almost certainly modelled on this close friend of Peacock's, who wrote *A Defence of Poetry* in response. He also wrote "Ode to the West Wind" and "Ozymandias."

ANSWER: Percy Bysshe Shelley

10. The Mickey Slim was a drink that enjoyed short lived popularity in the States in the 1940's and 1950's and consisted of one part gin and a dash of this substance. For 10 points each:

[10] Name this substance. It is more commonly known as a banned agricultural insecticide which was responsible for, amongst other things, decimating populations of bald eagles and Peregrine falcons.

ANSWER: DDT [or para-dichlorodiphenyltrichloroethane]

[10] DDT particularly affected apex predators such as raptors because it exhibited this phenomenon in which tissue concentrations of a substance become greater the *higher up the food chain you go*.

ANSWER: Biomagnification [or biological magnification or bioamplification, do NOT accept "bioaccumulation" or "bioconcentration" which refer to accumulation within one specific organism]

[10] The chief reason DDT is so bad for birds is the inhibition of a calcium-ATPase in a gland which produces this structure - this structure thus often became inadequately thin.

ANSWER: Eggshell [prompt on egg alone and ask specifically what about the egg was wrong]

11. For 10 points each, answer the following on folk stories classified as Arne-Thompson type 425 which are about lost husbands:

[10] A version of this 425C tale was written by Gabrielle-Suzanne Barbot de Villeneuve. In it a merchant gives his attractive daughter to a hideous monster in exchange for a rose. At the end, the monster becomes a prince after he is loved.

ANSWER: Beauty and the Beast

[10] Apuleius' *The Golden Ass* contains this 425B type story in which the titular woman is taken up to be wed to a mysterious creature by Zephyrus. She unwisely discovers his divine identity on the advice of her sisters.

ANSWER: "Cupid and Psyche"

[10] The 425A type story, "East of the Sun and West of the Moon" is from this country many of whose folktales mention the Askeladden. "Three Billy Goats Gruff" is a story from this country.

ANSWER: Norway (accept Norge)

12. The earl of Rosebery supposedly set himself three life goals: marry an heiress, win the Derby, and become Prime Minister. For 10 points each:

[10] In 1894, Rosebery won the Derby with the bay Ladas, named for the messenger of this Macedonian monarch, several of whose generals fought over his empire in the Wars of the Diadochi.

ANSWER: Alexander the Great [accept Alexander III]

[10] The next year, Rosebery won the Derby again with the bay Ser Visto, who gave his name to a plantation on this island. Early kings of this island built complexes at Sigiriya and Mihintale.

ANSWER: Sri Lanka [or Ceylon or Ilankai]

[10] In 1905, Rosebery won his third Derby with a chestnut with this name. One Roman with this cognomen was a propraetor of Asia praised by Julius Caesar for bravery in the Gallic Wars, the author of the *Commentariolum Petitionis* ("little handbook on electioneering").

ANSWER: Cicero

13. This author wrote about Patrice Lumumba's murder in *A Season in the Congo*, as well as a play about "King Christopher" set in Haiti. For 10 points each:

[10] Name this author, who claimed that Europe was "morally, spiritually indefensible" in his *Discourse on Colonialism*.

ANSWER: Aimé Fernand David Césaire

[10] Césaire was one of the initiators of this literary movement seeking a common identity for the black diaspora, which he explored in his *Notebook of a Return to My Native Land*. Sartre compared Césaire's use of this word to "picking up a stone that had been thrown at him."

ANSWER: **négritude**

[10] In the *Notebook*, the narrator recalls passengers on a tram mocking a black man described as "COMICAL AND UGLY," a quote taken from "The Albatross," a poem in this French Symbolist's collection *Les fleurs du mal*.

ANSWER: Charles **Baudelaire**

14. Answer some questions about mechanism determination in organic chemistry, using the example of the Ritter reaction between an alcohol and a nitrile under acidic conditions. For 10 points each:

[10] The Ritter reaction proceeds via this mechanism, in which a carbocation is formed following the loss of a leaving group, in this case H₂O, and then attacked by a nucleophile, in this case the Nitrogen lone pair.

ANSWER: **SN1** (accept **unimolecular nucleophilic substitution**) [don't accept "SN2" or "bimolecular nucleophilic substitution"]

[10] One way of showing that SN1 is followed instead of SN2 is by showing a high rate of reaction for tertiary alcohols compared to primary alcohols due to stabilisation of the carbocation by this effect in which electron density is donated from a filled sigma bonding orbital to an empty p orbital.

ANSWER: **Hyperconjugation** [do not accept or prompt on "Conjugation"]

[10] SN1 can also be shown by the use of 3 methyl butan-2-ol as the alcohol due to the occurrence of these 1,2 sigmatropic rearrangements in which a hydride group migrates to a neighbouring carbon to stabilise the carbocation via increased hyperconjugation.

ANSWER: **Wagner-Meerwein** rearrangement

15. The potential in this quantum mechanical system is proportional to one over the radial distance from the nucleus. For 10 points each:

[10] Name this system consisting of an electron orbiting a single proton.

ANSWER: **Hydrogen** atom

[10] Whilst the angular part of the Hydrogenic wavefunctions consists of the spherical harmonics, the radial wavefunctions are formed from this set of orthogonal polynomials named after a French mathematician.

ANSWER: **Laguerre** polynomials

[10] This Swedish physicist's namesake formula states that the difference in energy of two states of Hydrogenic systems is equal to a constant times the difference of the reciprocals of the squares of the principal quantum number of the two states.

ANSWER: Johannes **Rydberg**

16. This artist travelled to the sparsely populated northern extent of his home country to produce works such as *Stetind in the Fog*. For 10 points each:

[10] Name this nineteenth century artist of "The Tempest" who often painted only in black and white, such as in his views of the northern lights.

ANSWER: Peder **Balke**

[10] Peder Balke was from this Scandinavian country, whose other artists include the painter of *The Scream*, Edvard Munch.

ANSWER: **Norway** [or **Norge** or **Noreg**]

[10] Munch painted six versions and created multiple sketches and prints of this scene depicting his sister Sophie before her death from tuberculosis. In this scene Munch's aunt Karen grieves next to the red-haired Sophie.

ANSWER: *The **Sick Child*** [or *Det **Syke Barn***]

17. For 10 points each answer the following on the Kiyomizudera, Kyoto's most scenic temple:

[10] The Kiyomizudera contains a black lacquered statue of Daikokuten, one of a group of this many lucky gods in Japan. He holds a wish-granting hammer and a sack in most depictions.

ANSWER: **7** (accept **nana** or **shichi**)

[10] The Kiyomizudera is also home to the Otowa, one of these features which people use for ritual purification. When performing the full body misogi ablution, people stand under one of these natural features.

ANSWER: **waterfall** (accept **taki**)

[10] The Kiyomizu Temple complex is also home to the Jishu shrine, dedicated to Okuninushi, a kami who aids in matchmaking, and one-time ruler of this former province, home to the oldest Shinto shrine in Japan.

ANSWER: **Izumo**

18. Denmark's *Politiken* and Britain's *The Observer* argued that the bombing of this building was a deliberate move used to stop radio transmissions. For 10 points each:

[10] Name this Chinese Embassy targeted by the only CIA organised bombing in that conflict. The U.S.A. argued that the deaths of the three journalists who died in the bombing of this embassy occurred because a CIA source had used an outdated map.

ANSWER: Chinese Embassy in **Belgrade**

[10] Chinese state media refused to broadcast the official apology of this US President for 4 days after the bombing incident occurred. During this time, Vice President Hu Jintao described the attack as "barbaric" in a televised speech.

ANSWER: **Bill Clinton**

[10] This 2004 presidential candidate and general was Supreme Allied Commander in Europe at the time of the Kosovo War. His order to attack Russian troops in Pristina Airport was disobeyed when the Lieutenant at the scene insisted it would cause World War 3.

ANSWER: Wesley **Clark**

19. The discontinuous and continuous branches of this diagram meet at orthoclase. For 10 points each:

[10] Name this diagram which shows the order in which minerals will crystallise out of cooling magma.

ANSWER: **Bowen's reaction series**

[10] Bowen's reaction series is identical to a series named for Goldich, which orders minerals by their propensity to undergo this process. Thus, minerals such as olivine which crystallise at the highest temperatures have a greater potential to undergo this process.

ANSWER: **Weathering** [or **dissolution**]

[10] At the bottom of Bowen's reaction series and the Goldich dissolution series is this mineral with a Mohs hardness of 7 and formula SiO₂

ANSWER: **Quartz**

20. This substance comes in a hard form produced in high wind, and a soft form produced in low wind. For 10 points each:

[10] Name this substance formed when super-cooled water droplets in fog freeze onto other surfaces.

ANSWER: **Rime**

[10] Hard rime forms on this side of trees and other hard structures, while their leeward sides remain relatively untouched.

ANSWER: **windward**

[10] This sort of precipitation forms when supercooled droplets of water freeze onto snowflakes, a process known as accretion.

ANSWER: **graupel** (accept **soft hail** or **snow pellets**)