

OOT 2017

Packet 01 - Angels of Islington

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This should be the first packet of the tournament.

Tossups

1. This architect used alternating portrait and landscape windows in his design for a University of Pennsylvania dormitory. A bas relief by Jacques Lipchitz hangs in this architect's Miller House. A Harry Bertoia sculpture creates a cascade of light from a skylight to a white marble altar in this architect's red-brick chapel at the same location as this architect's (*) Kresge Auditorium, M.I.T. The Grasshopper, Womb, and the Tulip are among chair designs by this creator of the world's tallest arch. For 10 points, name this Finnish-American architect responsible for the TWA Flight Centre at JFK Airport and the Gateway Arch in St Louis.
ANSWER: Eero Saarinen

2. The disfigurement of Evan Godolphin inspires Shale Schoenmaker to become a plastic surgeon in one novel by this man; that novel suggests that the Kilroy graffiti was actually a schematic for a band-pass filter. Victoria Wren and a rat are both hypothesized as meanings of one entity created by this man, which leads to the "human yo-yo" (*) Benny Profane meeting Herbert Stencil. One of this author's protagonists discovers the Trystero after the death of Pierce Inverarity. The sexual exploits of another of his protagonists map out V2 rocket impacts. For ten points, name this creator of Oedipa Maas and Tyrone Slothrop, the author of *V.*, *The Crying of Lot 49*, and *Gravity's Rainbow*.
ANSWER: Thomas Ruggles Pynchon, Jr. [accept "V." until "novel"]

3. This deity's cult site at Didyma in Ionia was burnt down by Darius the Great's forces, and restored by Alexander in the 330s. One surviving temple to this deity is notably oriented north-south, and was dedicated to this god as "Epikouros", possibly in reference to the many Arcadians who fought as mercenaries. That temple is the World Heritage Site at Bassae. The Homeric Hymn to this god notably covers (*) two different cults, the first of which, the Pan-Ionian, was based at their supposed birthplace, Delos. This god's greatest centre was established where he slew Python. The twin of Artemis, for 10 points, name this Delphic deity and god of light and music.
ANSWER: Apollo

4. In a 2013 study, Theresa Steele suggested that the increased size of these objects in archaeological sites in South Africa indicated a population increase. The archaeological site of Fig Island in South Carolina is home to three well-preserved rings made of these objects. Edward S. Morse kickstarted Japanese archaeology by finding the first fragments of Jomon pottery in a mound of these objects in Omori. These objects were harvested by the Nootka peoples and used to make (*) *dentalium* jewelry. Wampum beads were made of these objects and they were used both to assert authority and as a form of currency. For 10 points, name these objects frequently found in middens, the calciferous remains of molluscs like clams which have been eaten.
ANSWER: shells (prompt on molluscs or mollusca; accept specific shells; prompt on waste remains)

5. AC Martin provided a classification for these structures based on internal anatomy. They're not insect bodies, but a scutellum may be found inside these structures where they aid in nutrient transport. The process of myrmecochory applies to these structures which is aided by the fact that they may contain a caruncle or lipid-rich (*) elaiosomes. The outer part of these structures may comprise a tegmen and testa. The ovule develops into this structure, the location of which differentiates angiosperms from gymnosperms. Comprising

the endosperm and an embryo, for 10 points name these structures which plants may disperse using fruits or the wind.

ANSWER: Seeds

6. **The fact that charge carriers have mass leads to the kinetic form of this quantity in systems with high carrier mobility. The leakage form of this quantity occurs when imperfect mutual coupling causes a portion of a transformer to not overlap with the leakage flux. This quantity can be multiplied by i and the angular frequency to determine (*) impedance.** Since it is equal to permeability times cross-sectional area over length times the number of coils squared, adding a metal core increases this property for a solenoid. For 10 points, name this property that describes the effect of a change in current in generating an EMF, discovered independently by Joseph Henry and Michael Faraday.

ANSWER: Inductance

7. **This player torched a hapless Bucs defense to set a record for quickest time to five touchdowns in a game at only 17 minutes. Despite going 4 of 10 for one interception and 34 yards, this quarterback helped hand the Patriots their biggest playoff loss of the Brady-Belichick era in a 33-14 Wild Card game. Apart from Brady, Roethlisberger and Manning, this man is the only other quarterback to win an (*) AFC championship game in the last 14 years.** Matt Ryan and this player were the only two quarterbacks taken in the first round of the 2008 draft. For 10 points name this quarterback who beat Colin Kaepernick's 49ers to win Super Bowl 47 with the Baltimore Ravens.

ANSWER: Joe Flacco

8. **This artist depicted a goat standing on a stool and a pigeon atop a ladder below a central tree in a work depicting his childhood home. This artist produced a series of canvases known as "painting poems" in which he incorporated text such as "le corps de ma brune". Along with Josep Royo, this artist created the (*) *World Trade Center Tapestry*, which was destroyed in 2001. This artist's sculptures include *Dona I Ocell* and this artist included musical notation and a white hand on the end of a wavy black arm reaching to a ladder in *The Harlequin's Carnival*.** *The Farm* is a work by, for ten points, which Catalan surrealist?

ANSWER: Joan Miró i Ferrà

9. **The production of carbon nanotubes by the Boudouard reaction is an example of this class of reaction. The radical version of this class of reaction occurs when one radical species abstracts a hydrogen from another radical species rather than coupling occurring. This reaction will occur if the gradient decreases as you move from left to right on a Frost diagram. The (*) Cannizzaro reaction is an example of this type of reaction in which 2 aldehyde molecules form an alcohol and a carboxylic acid.** For 10 points, name this type of redox reaction in which the same species undergoes both oxidation and reduction to form two different products.

ANSWER: Disproportionation reaction (prompt on redox before mention)

10. **The Internal Revolutionary Organisation was created to bring about the independence of this country, which had earlier witnessed two revolts named for its former capital, Tarnovo, both of which claimed to be restoring the House of Shishman. This country's capital was briefly occupied by brigands called *haiduks*, and the revolutionary "Apostle of Freedom" Vasil Levski was hanged there.** (*) Bashi-bazouks supplemented regular troops in suppressing the Plovdiv-based April Uprising, in this country's namesake "Horrors." 1878 saw, for 10 points, the end of Ottoman rule over what country, whose capital was liberated in the Battle of Sofia?

ANSWER: Bulgaria

11. **According to this work, everything lost on earth is found on the moon, and in it a war is undertaken to avenge the death of Troiano. While Paris is besieged, one woman in this work escapes from Namo's castle and elopes with Medoro. This work traces the ancestry of the House of Este to the offspring of Bradamante and**

the Muslim (*) Ruggiero, who was previously bewitched by Alcina. Love for the pagan princess Angelica causes the title character of this work to forget his duty to Charlemagne, and Astolfo rides a hippogriff in search of a remedy for his insanity. For 10 points, name this 1516 poem, using characters from the *Chanson de Roland*, a work of Ludovico Ariosto.

ANSWER: Orlando furioso [or *The Frenzy of Orlando* or Raging Orlando]

12. **James Hillman and Henry Corbin developed a school of psychology named for these entities, which, unlike their originator, they see as phenomenal. These things were described as “psychic ultra-violet” by their creator, who suggested that they were contiguous with inorganic matter. Their formulator stated that they attain “solidity, influence, and eventual consciousness in the encounter with empirical facts.” The primary** (*) anthropomorphic examples are the animus and the anima and their originator called them “primordial images” before coining this term in “Instinct and the Unconscious”. For 10 points, name these hidden forms in the collective unconscious in Jungian psychology, which manifest as universal images or patterns.

ANSWER: archetypes [accept Archetypus or Archetypen]

13. **One short story by this author imagines overhearing conversations among the dead in a cemetery. In addition to “Bobok,” this author created the pauper Makar, who writes letters to his second-cousin before she marries a rich widower. Another character created by this author of** (*) *Poor Folk* tells his brother, "It's not God that I don't accept [...] only I most respectfully return him the ticket." One of this man's novels is divided between a monologue and a diary, the latter entitled “Apropos of the Wet Snow.” Alyosha and Smerdyakov are two of the four title characters of another of his novels. For 10 points, this is what author of *Notes From Underground* and *The Brothers Karamazov*?

ANSWER: Fyodor Mikhailovich Dostoevsky

14. **One character in this play describes another's bedroom, hung with a tapestry depicting “Proud Cleopatra, when she met her Roman.” One character in this work boasts of his descent from Mulmutius to the Roman ambassador Caius Lucius, and imprisons a man who is visited by Jove atop a golden eagle. That man had previously instructed Pisanio to murder a woman at** (*) Milford Haven, the home of two brothers raised by Belarius, who, after the death of the character they know as “Fidele,” sing the lament “Fear no more the heat o' the sun.” Iachimo convinces Posthumus of the infidelity of Imogen, the daughter of the title British monarch, in what William Shakespeare play?

ANSWER: Cymbeline, *King of Britain*

15. **This historian's most recent book was praised for giving discernibly distinct identities to Orville and Wilbur Wright. His research into the Panama Canal for his book *The Path Between the Seas* inspired this man's later writing of a biography of Teddy Roosevelt entitled *Mornings on Horseback*. This historian narrated Ken Burns's *The* (*) *Civil War*, and a book by him was adapted into an HBO miniseries starring Paul Giamatti. That book by this man was originally intended to be a dual biography also featuring Thomas Jefferson, but ended up focusing on one founding father's correspondence with his wife Abigail. For 10 points, name this popular historian who wrote *John Adams* and *1776*.**

ANSWER: David McCullough

16. **The only music venue in the word which records performances live-to-vinyl is this city's Blue Room which was started by Jack White who now lives here. While at college in this city, Morris Frank became the first American to receive a seeing eye dog and started the Seeing Eye organisation. The roots of “Meat and Three can be traced to this city whose Maxwell House Hotel gave its name to the coffee brand. This city's Centennial Park is home to a** (*) full scale replica of the Parthenon. This largest city on the Cumberland river is home to a number of colleges including Vanderbilt and Fisk which gained it the nickname “Athens of the South.” For 10 points, name this home of Country music, the state capital of Tennessee

ANSWER: Nashville

17. **The author of this work argues against the existence of “incorporeal bodies” suggesting that they “signify nothing at all.” In a section on manners, this work argues “that men give different names, to one and the same thing, from the difference of their own passions.” The fourth section of this book describes “a confederacy of deceivers”, the (*) Kingdom of Darkness caused through the obscuring of scripture. This work describes how when a group of men agree to “authorise and give up my right of governing myself to this man” they can form a Commonwealth. For 10 points, name this book in which “the life of man” is described as “solitary, poor, nasty, brutish and short”, a work of Thomas Hobbes.**

ANSWER: Leviathan

18. **The optional stopping theorem says that this quantity for a martingale at a stopping time is equal to this quantity for its initial value under certain conditions. Wald’s lemma can be used to simplify the calculation of this quantity for a random number of random quantities. The values of this quantity for the powers of a random variable X define the moments of X, and the (*) variance of X is given by this quantity for X squared minus the square of this quantity for X. The Law of Large Numbers describes convergence to this quantity. For 10 points, name this quantity which, for a discrete random variable, is the probability weighted sum of possible outcomes, equal to the arithmetic mean if they are equally likely.**

ANSWER: Expected value [or expectation or E(X), accept mean before mention, prompt on “average”]

19. **The first movement of Schnittke’s *Symphony No. 5* is also a stand-alone work of this type. A group of strings who play entirely on open strings make up the “Ad lib” group in a Ralph Vaughan Williams work of this type which splits string players based on ability. Elgar’s *Introduction and Allegro* is structured similarly to a work of this type. (*) Arcangelo Corelli’s Opus 6 is a set of twelve examples of this type of composition, which includes the *Christmas Concerto*. For 10 points, name this type of work that is characterised by a small “concertino” ensemble of solo instruments contrasted with a larger “ripieno” orchestra and translates as “big concert”.**

ANSWER: Concerto Grosso [do not prompt on partial answer, prompt on concerto for string quartet after the Elgar clue seeing as it is technically correct]

20. **During World War II, this country sent 2,000 of its citizens to be interned in the United States. This country fought a brief war with a northern neighbor over three military installations known as “fakes,” the Paquisha War, which was followed several years later by the Cenepa War, a border dispute later adjudicated under the Brasilia Presidential Act. One president of this country, the successor to Alan García, carried out a (*) 1992 “self-coup,” and after a contested election in 2000, that leader of the Cambio 90 party was removed for being “permanently morally disabled.” Name, for 10 points, this South American country, where Abimael Guzmán led Shining Path guerrillas against Alberto Fujimori.**

ANSWER: Republic of Peru [or República del Perú]

Tiebreaker

21. **The epitome of Stephanus of Byzantium records that these creatures were transformed into the Leukai, or White Islands, having plunged into the sea off Crete after losing a musical competition to the Muses. In the *Argonautica* Jason brings Orpheus along on the advice of Chiron in order to defeat these creatures. According to Ovid’s *Metamorphoses* these figures were the companions of a young Persephone. Circe advises one hero to use beeswax to protect his crew from these creatures. For 10 points, name these figures from Greek mythology that prompted Odysseus to order himself tied to the mast of his ship so that he could hear their song without being lured to his death.**

ANSWER: sirens

Bonuses

1. This theory provided an explanation for the null result of the Michelson Morley experiment. For 10 points each:
[10] Name this 1905 theory of Albert Einstein, whose two postulates are that the laws of physics are invariant in all inertial systems and that the speed of light in a vacuum is constant for all observers.

ANSWER: **Special Relativity**

[10] When converting between different inertial frames of reference, you have to make use of a transformation named for this scientist, whose namesake factor is equal to one over the square root of 1 minus velocity square over c squared.

ANSWER: Hendrik **Lorentz**

[10] This experiment, which provided the first confirmation of time dilation, used canal rays accelerated by a large electric field to show the need to include Lorentz factors in Doppler shift predictions.

ANSWER: **Ives-Stilwell** experiment

2. Nigerian anglophone literature extends far beyond *Things Fall Apart*. For 10 points each:

[10] This Nigerian-born British author died in 2017. Her abusive husband burnt her first manuscript, after which she left him and published books centred on female experience like *The Bride Price* and *The Joys of Motherhood*.

ANSWER: Buchi **Emecheta**

[10] This author's TED Talk "We Should All Be Feminists" was sampled on Beyoncé's song "Flawless" and she won acclaim for her novel *Americanah*. She has recently been criticized for comments on transsexuality.

ANSWER: Chimamanda Ngozi **Adichie**

[10] In a hotly anticipated exhibition boxing match later this year Evander Holyfield will fight Bola Ahmed Tinubu, a former Nigerian political party leader in a match officiated by this Nobel-winning playwright of "Death and the King's Horseman" and "The Lion and the Jewel."

ANSWER: Ben **Okri**

3. This work was commissioned along with three other canvases to hang opposite the altar in a Scuola Grande named for the saint this painting depicts. For 10 points each:

[10] Name this painting in which the central figure is surrounded by broken tools like an axe and a hammer. A large crowd on the left of the canvas watches on in awe while a certain saint flies in from the top of the canvas.

ANSWER: *The **Miracle of the Slave*** [accept *The **Miracle of St Mark***]

[10] *The Miracle of the Slave* is a work by this Venetian Mannerist painter of *The Origin of the Milky Way* and a version of the Last Supper set in a dark room with the table at an angle and ghostly angels flying across the ceiling.

ANSWER: **Tintoretto** [accept Jacopo **Robusti**]

[10] Tintoretto created multiple paintings of this other Biblical scene. One shows a red-clad Judas, a dog, and a kneeling Christ in the foreground of a large room with a blue- and grey-tiled floor.

ANSWER: **Christ washing the feet of his disciples** [accept equivalent descriptive answers]

4. For 10 points each, answer the following on the problems with Soviet planned economics:

[10] One problem with periodic targets is a rush to achieve production goals at the end of a time period. This may cause the production of this sort of good, demand for which decreases as consumer wealth increases unlike normal goods.

ANSWER: **inferior** goods

[10] Another major problem with Gosplan's system of "material balances" was its inability to perfectly adjust for fluctuations in demand leading to this state often contrasted with a glut.

ANSWER: **undersupply** (accept **scarcity** or **paucity**; accept descriptions like "supply is too low")

[10] The method of balances has been contrasted with the input-output model developed by this economist who names the apparent paradox that the United States' exports were comparatively more labour intensive than its imports.

ANSWER: Wassily **Leontief**

5. The first program of this type was written by Grace Hopper in 1952 for the A-0 programming language. For 10 points each:

[10] Name this type of computer program that translates higher level source code into lower level object code.

ANSWER: **Compiler**

[10] This term is often loosely applied to dynamic high-level languages like Python, Perl, or Ruby, which can be run through an interpreter without the need for compilation. They are often used to automate a series of tasks.

ANSWER: **Scripting** language (or **script** language)

[10] Many scripting languages can be used with one of these interactive environments in which the user inputs single expressions to be processed and returned. Examples include the UNIX command line or Ruby's interactive IRB shell.

ANSWER: **read-eval-print loop** [or **REPL**; or **interactive toplevel**]

6. This historian's first book *Red Eagle, White Star* is about the 1919-20 Soviet Polish War, and was based on a PhD dissertation, which he claimed was about British policy towards Poland to satisfy communist authorities. For 10 points each:

[10] Name this English historian, the author of a history of Poland entitled *God's Playground*. He also wrote *Vanished Kingdoms* and *Europe*.

ANSWER: Norman **Davies**

[10] One of the vanished kingdoms discussed by Davies is this Cumbric-speaking kingdom whose king Ceretic ruled from Dumbarton and was sent a letter by Saint Patrick.

ANSWER: **Alt Clud** [accept **Strathclyde** or **Ystrad Clud** or **Alclud**]

[10] In the introduction to *Vanished Kingdoms*, Davies says that he was inspired by this historian, whose voluminous *Decline and Fall of the Roman Empire* has been cited as revolutionizing both historical use of sources and historical prose.

ANSWER: Edward **Gibbon**

7. It is presumably the grace and elegance of swans in flight that cause them to be featured in classical music rather than their hissing and arm-breaking exploits. For 10 points each:

[10] *The Swan*, a piece originally for cello and two pianos by Camille Saint-Saëns, was the only movement that the composer allowed published in his lifetime from this 14-movement work.

ANSWER: *The Carnival of the Animals* [or *Le Carnaval des Animaux*]

[10] The finale of this composer's *5th Symphony* was inspired by the sighting of 16 swans in flight. That finale then ends with six staggered chords separated by silence.

ANSWER: Jean **Sibelius**

[10] This best known work by other notable Finnish composer, Einojuhani Rautavaara, is subtitled *Concerto for Birds and Orchestra* and features recordings of Whooper Swans.

ANSWER: **Cantus Arcticus**

8. This character, known only by a nickname, married her husband after a false pregnancy and is mocked by another character as "the Mousie" who "tooted brandy immodestly and spent half her time in the upchuck." For ten points each,

[10] Name this wife of the biology professor Nick, who spends long periods of time lying on the bathroom floor offstage.

ANSWER: **Honey**

[10] The story of “the Mousie” is told by this history professor, George, who informs his wife Martha of the death of their fictional son in a road accident in *Who’s Afraid of Virginia Woolf*, a play by this recently deceased American playwright.

ANSWER: Edward Franklin **Albee III**

[10] In this play by Albee, the Pritzker prize winning architect Martin struggles to explain his animal love for the title figure to his wife Stevie. Its title is a comic reference to both *Two Gentlemen of Verona* and the origins of the word “tragedy”.

ANSWER: **The Goat or, Who Is Sylvia?**

9. In despair at the lack of interest in his writings, this thinker shot himself six times in the head without killing himself, instead losing sight in one eye. For ten points each:

[10] Name this French writer and aristocrat, the author of the treatise *L’Industrie* and the 1821 work *Du système industriel*.

ANSWER: Claude Henri de Rouvroy, comte de **Saint-Simon**

[10] In *L’Industrie*, Saint-Simon argued that this “is the science of production.” Harold Lasswell famously defined this as “who gets what, when, and how.”

ANSWER: **Politics** (accept **la politique**)

[10] A disciple and one-time secretary of Saint-Simon, this thinker is credited with founding positivism in works such as *A General View of Positivism*. He popularized the term sociology which had first been coined by Emmanuel-Joseph Sieyès.

ANSWER: Isidore Auguste Marie François Xavier **Comte**

10. In this novel, Beatrice Nest, an inhabitant of the “Ash Factory,” studies Ellen Ash because her supervisor dissuaded her from working on Randolph Henry Ash. For ten points each,

[10] Name this novel, in which Nest briefly assists Roland Michell and Maud Bailey in investigating a possible affair between Ash and his fellow poet, Christabel LaMotte.

ANSWER: **Possession**

[10] *Possession* won the 1990 Booker Prize for this author, who has long feuded with her sister, Margaret Drabble, over the latter’s use of a family tea set in one story.

ANSWER: Antonia Susan **Byatt**

[10] Byatt also wrote *The Children’s Books* based on the life of this British fabian and children’s author who wrote *The Railway Children* and *Five Children and it*.

ANSWER: E(dith) **Nesbit**

11. Dartmouth was the sailing point for the Crusades of 1147 and 1190 and was where the pilgrim fathers intended to set out from before returning to England after realising the *Speedwell* was not seaworthy. For 10 points each:

[10] Dartmouth is found in which county also home to the cities of Exeter and Plymouth. It is the only one to border Cornwall.

ANSWER: **Devon**

[10] This Dartmouth native and Baptist preacher invented the atmospheric steam engine that usually bears his name around 1712.

ANSWER: Thomas **Newcomen**

[10] Formerly the home of Walter Raleigh, Greenway House near Dartmouth was more recently occupied by this author of *Murder on the Orient Express* and her husband, Max Mallowan. She referenced it in her mysteries *Dead Man’s Folly* and *Five Little Pigs*.

ANSWER: Agatha Mary Clarissa **Christie**

12. This author has asserted that “books, once they are written, have no need of their authors.” For 10 points each:

[10] This year, a controversial article by Claudio Gatti claimed to identify translator Anita Raja as this elusive pseudonymous best-selling author of *La Frantumaglia*.

ANSWER: Elena **Ferrante**

[10] This other pseudonym was used to publish the 1999 Italian novel *Q*, set during the Protestant Reformation. This nom-de-plume has been repeatedly reused by authors and artists, becoming an “open pop star.”

ANSWER: Luther **Blissett**

[10] This Italian author sometimes used the pseudonym Dedalus, but used his own name for works like *Faith in Fakes: Travels in Hyperreality, Serendipities, Six Walks in the Fictional Woods*, and, most recently, *Numero Zero*.

ANSWER: Umberto **Eco**

13. Answer some questions about the world’s seventh-longest river, for 10 points each:

[10] The River Ob is the westernmost of the three major rivers that flow into the Arctic Ocean from this region. This region extends eastward from the Ural mountains and accounts for over 75% of Russian territory.

ANSWER: **Siberia**

[10] The River Ob empties into the world’s longest estuary, the Gulf of Ob, which feeds this sea of the Arctic Ocean. Novaya Zemlya separates this sea from the Barents Sea to the west.

ANSWER: **Kara** Sea OR **Karskove** more

[10] The oldest bridge over the Ob’s longest tributary, the Irtysh, is located at this city. This second-most populous in Siberia, behind Novosibirsk was the subject of numerous Russian memes depicting the Winged Doom bird and implying any city so desolate was a drug hotspot.

ANSWER: **Omsk**

14. The *Philippics* were delivered by Cicero in condemnation of this statesman and general. For 10 points each:

[10] Name this Roman general and politician who delivered Julius Caesar’s funeral oration.

ANSWER: **Marcus Antonius** (accept **Mark Antony**)

[10] First married to Clodius Pulcher, this wife of Mark Antony was claimed by Cassius Dio to have stabbed Cicero’s tongue after his death in the proscriptions. Martial records a rude verse Augustus wrote about this woman.

ANSWER: **Fulvia**

[10] Fulvia helped raise legions for Antony which fought in this short conflict against Octavian. The reprisals that affected the namesake city of this war are remembered in the first book of Propertius’s *Elegies*.

ANSWER: **Perusine War**

15. For 10 points each answer the following on the Tijaniya, West Africa’s most numerous Sufi order:

[10] The Tijaniya meet to perform the Ḥaḍarat al-Jum’ah on this day. This is the holiest day of the week in Islam and the *khutbah* is read before the *jumah* prayer on this day.

ANSWER: **Friday**

[10] Known as Gammu in Wolof, this event takes place on the 12 of Rabi' al-awwal and is celebrated with major public gatherings in the city of Tivouane, and the public recitation of certain *salawat*.

ANSWER: **Mawlid** (accept **Milaad** or **mawlidu n-nabiyvi**; accept **prophet Muhammad’s birthday**)

[10] Tijani often practice Zikr or the remembrance of Allah after saying this prayer. This is the prayer prayed as the sun is below the horizon but its light is still visible and is also when Islamic fasts are broken.

ANSWER: **maghrib**

16. Answer some questions about the Schönflies [shern-fleece] notation, which can be used to describe point groups for molecular spectroscopy. For 10 points each:

[10] In Schönflies notation, this letter notates an improper rotation axis with a subscript number n indicating the n-fold rotational symmetry.

ANSWER: **S**

[10] 6-coordinate molecules such as sulfur hexafluoride and tungsten hexacarbonyl typically have this molecular geometry, which corresponds to the point group Oh [o-h] in Schönflies notation.

ANSWER: **Octahedral** (accept anything else implying an **Octahedron**)

[10] This letter denotes a mirror plane in Schönflies notation. More generally, it is used to describe bonds which have cylindrical symmetry along the bond axis, such as those between Carbon and Hydrogen in alkanes.

ANSWER: **Sigma**

17. Quite a few nineteenth-century Italian composers chose to set their works in Scotland. For 10 points each:

[10] Gioacchino Rossini set a trend by setting this opera in Scotland. James V disguises himself as “Uberto” to seduce Douglas’s daughter Elena, the title character of this work.

ANSWER: **La donna del lago** [accept *The Lady of the Lake*]

[10] Gaetano Donizetti depicted the feud between the Ravenswoods and the Ashtons in this opera. The title character, the lover of Edgardo, recounts a chilling dream in “Regnava nel silenzio.”

ANSWER: **Lucia di Lammermoor** [accept *Lucy of Lammermoor*]

[10] Unlike Rossini and Donizetti, Giuseppe Verdi turned to William Shakespeare, not Walter Scott, to write this opera, set in Scotland and featuring the Witches’ Chorus and the aria *Una macchia è qui tuttora!* (“Yet here’s a spot!”)

ANSWER: **Macbeth**

18. Even before the British and French got involved, there were plenty of empires in Africa. For 10 points each:

[10] Name this empire which shares its name with a modern African state, this African Empire, centred around modern Senegal and Mauritania which flourished from 750 to 1078. Ibrahim al-Farazi described this empire as a “land of gold.”

ANSWER: **Ghana** Empire (also accept **Wagadu** Empire; accept **Akwar**)

[10] This West African Empire was founded by Sundiata Keita and ruled by the infamously rich Mansa Musa, who reportedly took 60,000 men with him on *hajj*.

ANSWER: **Mali** Empire (accept **Nveni** or **Niani**)

[10] Founded by the descendants of the builders of Great Zimbabwe, this Southern African Shona empire, believed by some Europeans to contain the legendary mines of Solomon, stretched from the Zambezi river to the Indian Ocean and flourished between 1430 and 1760.

ANSWER: **Mutapa** Empire (accept **Mwenemutapa** or **Muhumutapa** or **Monomotapa**)

19. The fraction of receptors that are bound to ligands equals free ligand concentration raised to this quantity, divided by Kd plus free ligand concentration raised to this quantity. For 10 points each.

[10] Name this quantity that describes the cooperativity of ligands binding a receptor. A positive value indicates that the binding of one ligand facilitates the binding of more ligands.

ANSWER: **Hill coefficient** [or **Hill parameter**]

[10] Perhaps the best known example of cooperative binding is that of oxygen with this protein found in red blood cells which gives rise to a sigmoid dissociation curve.

ANSWER: **Haemoglobin**

[10] This scientist’s namesake effect explains the right-shift of the oxygen dissociation curve at increasing partial pressures of carbon dioxide. As a result, oxygen is more readily offloaded to exercising muscle.

ANSWER: **Bohr** effect

20. This historian, who frequently writes for The Nation, argued that the US government used the Iran/Contra affair as a testing ground for future Imperialist actions. For 10 points each:

[10] Identify this NYU historian who garnered a lot of press attention with the publication in 2014 of *The Empire of Necessity*.

ANSWER: Greg **Grandin**

[10] An earlier work of Grandin's concerned the settlement of Fordlândia, which Henry Ford established in order to cheapen his rubber supply. In 1945 Ford's grandson sold it back to this country, then headed by Getulio Vargas.

ANSWER: **Brazil**

[10] Grandin, in his article about the Iran/Contra, lists many insidious governmental action including mention of Mena Airport, which is argued to have been a hub for the cocaine trade, in this state, then governed by Bill Clinton.

ANSWER: **Arkansas**