PACE Partnership for Academic Competition Excellence

2015 NSC - Official Scoresheet

Round	14	Room	
Bracket			
Reader			

Team									Team								
Player Names																	
Q#					Bonus	Steals	Ques. Total	Run. Score					Bonus	Steals	Ques. Total	Run. score
1																
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TB1																
TB2																
TB3																
SD																
Player 20s																
Player 10s																
Point totals																
Final score																

	Substitutions before Tossup 11		Substitutions before Tossup 11	
	Out:	In:	Out:	In:
	Out:	In:	Out:	In:

Circle winning team above. Clearly mark if game goes to OT/SD. **Fill out "Point totals" row completely.**
If there are substitutions, please note tossups by each player in "20s" and "10s" rows. Below is for Tab Room use only:

RH	RS	BH	BS	Left	Right	BH	BS	RH	RS

1. In the worst case, this function is the tight asymptotic lower bound of the median of medians algorithm to select the *k*th largest element. For a word size of k, the worst case performance of radix sort is big **O** of k times this function with respect to the elements being sorted. Searching an unbalanced binary search tree has a worst case runtime tightly bounded by this function. This function is the best case time complexity of **(*)** bubble sort. Algorithms that traverse from the first to last element in a singly linked list without a tail pointer and ones that iterate through a one-dimensional array in a for loop are bounded by this function. For 10 points, name this function that dominates algorithms that run in Big O of n time.
ANSWER: __linear__ function [or __linear__ time; or Big O of __n__ until it is read] <Bentley>

2. At the end of this novel, the protagonist thinks "Zero hour...time to go" after habitually checking his broken watch. A flashback describes how its protagonist's father pursues a relationship with the lab tech Ramona after the protagonist's mother Sharon abandoned him, taking his pet rakunk Killer. In a narrative thread of this novel, the protagonist travels from the "pleeblands" to the ruins of Paradice. A character in this novel who attends the Watson-Crick Institute and gets a job with **(*)** RejoovenEsense took his nickname from the game *Extinctathon*. This novel's sequel in the *MaddAddam* trilogy is *The Year of the Flood*. For 10 points, name this 2003 novel in which Snowman's flashbacks detail his pre-apocalypse life with the two title characters, by Margaret Atwood.
ANSWER: ___Oryx and Crake___ <Carson>

3. Nusselt film theory describes this process. The working fluid undergoes this process after it is turbined, before it is pumped, in a Rankine cycle. An exit stream undergoes this process, and then a recycle, during reflux. This process shares its name with a method of polymerization contrasted with addition. Cold fingers are used to effect this process, which often occurs in glassware named for **(*)** Liebig. Silver iodide serves as a nucleus for this process to occur during cloud seeding. This process begins to happen as temperature dips below the dew point. This process occurs in the tube leading to the receiving flask in a distillation. This exothermic process is the inverse of vaporization. For 10 points, name this process in which a vapor is converted into a liquid.
ANSWER: __condensation__ [or __condensation polymerization__; prompt on __cooling__ or __subcooling__ or __supercooling__] <Silverman>

4. An unfinished piece by this composer contains a central "Purgatorio" movement surrounded by two scherzos. Another of his pieces ends with an alto or baritone repeating "Ewig… ewig" (ay-vig), or "Forever… forever." The opening adagio was the only movement of his tenth symphony that he fully orchestrated before his death. Leonard Bernstein was the first to record the complete set of this composer's symphonies and song cycles, one of which opens with "The **(*)** Drinking Song of Earth's Misery." This composer's eighth symphony sets the hymn "Veni Creator Spiritus" in the first part and the finale from Goethe's *Faust* in the second, and is nicknamed for the many musicians required. For 10 points, name this composer of *Das Lied von der Erde* and the "Symphony of a Thousand."
ANSWER: Gustav __Mahler__ <Rosenberg>

5. This event largely did not affect institutions which belonged to the Suffolk system. A cartoon depicting "The Times" of this event shows a shining hat subtitled "GLORY" in the sky above a city street. During this event, thousands of New Yorkers attacked hoarding merchants in the Flour Riots. This event inspired the unsuccessful Divorce Bill and the narrowly-passed Independent Treasury Act. This event is often blamed on an order issued by Levi Woodbury which prevented (*) public lands from being bought with "wildcat currency." This event was partly caused by the Specie Circular and by the credit policies of "pet banks." For 10 points, name this economic crisis, a financial panic that began in the first year of Martin Van Buren's term.
ANSWER: **Panic** of **1837** <Brownstein>

6. A body movement called "arc de cercle" affected people diagnosed with this condition by Jean-Martin Charcot. The idea of pressing a doctor's thumb to the patient's forehead to relieve this condition was relayed in a text co-written by Josef Breuer. In the late 19th century, physicians like George Taylor induced what they called "paroxysm" to treat this condition, often using mechanical (*) vibrators. Bertha Pappenheim, known as "Anna O," was the main case study in Sigmund Freud's 1896 *Studies on* this disorder. The Greek-derived name for this condition reflects the ancient view that it stemmed from an internally-wandering uterus. For 10 points, name this now-discredited mental diagnosis usually given to women, whose purported "mass" form causes society-wide panic.
ANSWER: **hysteria** [or **conversion** disorder] <Jackson>

7. This deity transforms Nyctimene, who had been raped by her father, into a symbolic animal. During the Gigantomachy, this deity hurls the island of Sicily at the fleeing Enceladus. This deity gives Heracles a Hephaestus-crafted rattle with which to frighten the Stymphalian Birds. This deity assists Telemachus in the disguise of Mentor. According to Ovid, this goddess angrily tears up the winning (*) tapestry of Arachne before turning her into a spider. She is born after her mother is turned into a fly and swallowed by Zeus, who suffers an enormous headache and calls for Hephaestus to cleave his skull, from which this goddess emerges fully armed. For 10 points, name this daughter of Metis and Zeus, the martial Olympian goddess of wisdom.
ANSWER: **Athena** [or **Minerva**; or **Athene**; or Pallas **Athena**] <Gupta>

8. This author wrote a short story in which Mr. Swaffer gives a house to the title character and her husband Yanko Goorall, the latter of whom calls out for water in his native tongue and is abandoned before his death. In another of his stories, a captain decides to help the deserter Leggatt escape from the HMS *Sephora*. Another character created by this author describes his trip to a "whited sepulchre" to accept a job from the (*) Company to replace Fresleven. This author wrote a book about a journey made to the Central Station that is part of a framed narrative told onboard the *Nellie*. For 10 points, name this Polish-born British author of the short stories "Amy Foster" and "The Secret Sharer" who wrote about Marlow's search for Kurtz in *Heart of Darkness*.
ANSWER: Joseph **Conrad** [or Josef Teodor Konrad **Korzeniowski**] <Gehring>

9. In China, statues of this animal often appear as the pedestal of monuments like the Nestorian Stele. According to legend, a golden one of these animals took a sword called Heaven's Will back from Vietnamese freedom fighter Le Loi. Objects named for this animal were used in a "crane formation" to win the Battle of Hansan Island and the Battle of Sacheon during the Imjin War. Admiral Yi invented that type of (*) vessel named for this animal, which was used to thwart Toyotomi Hideyoshi's attempted invasion of the Joseon kingdom. Along with ox scapulae, a notable part of these animals were inscribed with questions then heated to make oracle bones. For 10 points, name these animals, which name a sort of Korean ship with a shelled exterior.
ANSWER: **turtle**s [or **tortoise**s; or **bixi**] <Brownstein>

10. A prominent visitor center in this region is named for Ernest Coe, whose advocacy for this region alienated pretty much everyone. The Bear Lake Mounds are in this ecological region, where humans built the Mud Lake Canal between 750 and 1200 AD. HM-69, a Nike Hercules Missile base, is located in this region. The Calusa people once inhabited this region which is cut through by the (*) Tamiami Trail. Marjory Stoneman Douglas advocated for saving this region, which is afflicted by invasive species such as the melaleuca tree and the Burmese python. It held an early ballistic anti-nuke system to defend against the Cuban nuclear threats. For ten points, name this so-called "River of Grass," a protected wetlands between Lake Okeechobee and Biscayne Bay in southern Florida.
ANSWER: Florida **Everglades** [or **Everglades** National Park; prompt on "**Florida**"] <Gupta>

11. The most common region used in animal DNA barcoding is a stretch of 600 base pairs encoding a subunit of one of these proteins. After being released into the cytoplasm, one of these proteins binds to Apaf-1, initiating the instrinsic apoptosis pathway. In phase I of drug metabolism, polar groups are introduced to chemicals by the P450 oxidase type of these proteins. One of these proteins in the thylakoid membrane transfers electrons between (*) photosystems II and I. One of these proteins gets reduced by the oxidation of coenzyme Q in Complex III, and four of them each transfer an electron to one oxygen molecule to make water in Complex IV. For 10 points, name these heme-containing proteins whose "c" variety plays a key role in the electron transport chain.
ANSWER: **cytochrome**s [accept **cytochrome** c oxidase; accept **cytochrome** b6f; accept **cytochrome** bc1] <Gupta>

12. In one work by this man, a judge named Bridoye reveals that he has always doled out sentences by rolling dice. This author was said to have employed the trope of the "grotesque body" to critique the wars of his time in a Mikhail Bakhtin study named after this man "and his world". Another of this man's characters determines whether or not he should get married by making a journey to (*) Bacbuc, where he is told to "drink!" One of this author's title characters builds a religious institution which has the motto "Do what thou wilt". This author satirized contemporary religion by creating the Oracle of the Holy Bottle and the Abbey of Theleme in a series of satirical novels named for two giants. For 10 points, name this French creator of Gargantua and Pantagruel.
ANSWER: Francois **Rabelais** [or Alcofribas **Nasier**] <Jose>

13. The lands belonging to these people were partitioned during a period known as "The Ruin." These people formed a vassal state after rebelling against the rule of foreign magnates in the Khmelnytsky Uprising, which marked the beginning of The Deluge. The words "Volga, Volga" begin a popular folk song about a leader of these people named Stenka Razin. These people formed a (*) "hetmanate" called the Zaporizhian host. One of their leaders impersonated Peter III and led a 1773 rebellion against Catherine the Great. Yemelyan Pugachev was a member of these people, many of whom lived around the Don or Dnieper River. For 10 points, name these nomadic warrior people who alternately rebelled against or fought for Russia.
ANSWER: **Cossack**s <Wang>

14. In statistical mechanics, the expected number of these particles in a given state is inversely proportional to an exponential weight minus one. Composite particles that belong to this general class are the basis for the BCS theory of superconductivity. These particles leave the sign of the wavefunction unchanged upon particle exchange and include (*) Cooper pairs. They do not obey the Pauli exclusion principle because they obey a set of statistics named for their namesake and Einstein. Photons are an example of the "gauge" type of these particles that have integer spin. For 10 points, name this particle whose Higgs type was discovered at the Large Hadron Collider.
ANSWER: **boson**s <Eltinge>

15. The Getty Museum contains a portrait study by this artist of a model from Santo Domingo named Joseph with upturned eyes. During a trip to Rome, he painted a nude man holding back a terrified horse before it takes off down the Corso. The psychiatrist Étienne-Jean Georget commissioned him to make *Portrait of a Kleptomaniac,* for which this artist visited an (*) insane asylum. In another painting, a military officer is seated almost completely turned around on his rearing horse, and brandishes a curved sword. This artist of *Race of the Riderless Horses* and *The Charging Chasseur* also painted a black man standing atop a human pyramid and waving a rag to attract a distant ship. For 10 points, name this French painter of *The Raft of the Medusa*.
ANSWER: Jean Louis Theodore **Gericault** <Bentley>

16. Frank Ramsey translated this book into English at Cambridge while its author was allegedly twisting kids' ears as a provincial schoolteacher. According to this book, facts can be combined into a "picture" which has a "representing relation" to reality, though the limits of one's language are the limits of one's world. This book's author later rejected that theory in favor of a "family resemblances" theory of meaning. This book, which inspired the pro-science (*) Vienna Circle, has a title paralleling a book on religion by Baruch Spinoza. It starts by asserting "The world is everything that is the case" and ends "What we cannot speak of, we must pass over in silence." For 10 points, name this attempt to solve all of philosophy, a short early work by Ludwig Wittgenstein.
ANSWER: *Tractatus Logico-Philosophicus* [prompt on Ludwig Wittgenstein's *Tractatus*] <Jackson>

17. The Cave of Ramban in this place is considered the final resting place of Nachmanides. In the *birkat hamazon,* a set of blessings said after consuming bread, the third blessing concerns this place. The Talmudic legend about Akiva being a "lyre for all your songs" inspired a popular song about this place "of Gold." Many Passover services end with the participants singing the song (*) "Next Year in" this place. A pair of historical tragedies in this city is remembered on the Ninth of Av. Its "Old City" includes a popular site of lamentation, the Western Wall, as well as the Temple Mount, the place where the Tabernacle was kept within the Holy of Holies. For 10 points, name this city where many Jews believe a Third Temple will be built in end times.
ANSWER: **Jerusalem** [or **Yerushalayim**; or **Old City** until mentioned; accept Upper **Kidron** Valley until "this city" is read; accept **Wadi al-Joz** until "this city" is read] <Gupta>

18. In this novel, a character promotes healthy living with initiatives like Banish the Booze Week and Better Babies Week. Joyce Lanyon enters a loveless marriage with this novel's main character before he moves to Vermont at this book's end. A woman in this novel dies after smoking a half-finished cigarette while on St. Hubert. This novel's title character hosts a lunch to which he invites his two fiancees, of whom he eventually chooses a native of Wheatsylvania, North Dakota named (*) Leora Tozer. The protagonist of this book grows up in Elk Mills in the state of Winnemac, and discovers the X Principle while working with fellow scientists Terry Wickett and Max Gottlieb. For 10 points, name this novel by Sinclair Lewis, whose title character is a doctor named Martin.
ANSWER: *Arrowsmith* <Sy>

19. One player of this instrument collaborated on the album *At Basin Street* with Clifford Brown. Another player of this instrument played on a duet with Sonny Rollins on the song *The Surrey with the Fringe on Top.* Two players of this instrument collaborated on an album that contains tracks of each of their "blues". In 1952, those two players "battled" at a Carnegie Hall concert. Another player of this instrument recorded the album (*) *Moanin* along with his Jazz Messengers. Played by Max Roach and Art Blakey, this instrument joins the piano and a bass in the normal lineup of a jazz trio. Players of this instrument frequently use the hi-hat and sometimes use brushes. For ten points, name this instrument played by Gene Krupa and Buddy Rich, a percussion instrument.
ANSWER: **drum**s [or **drum kit**; prompt on **percussion**] <Puma>

20. The Haldane Mission attempted to curb the spending on these objects. Horace de Vere Cole pretended to be part of a delegation from Abyssinia so that he and his friends, including Virginia Woolf, could visit one of these objects. This was the less common of the two objects that the country meeting the "two-power standard" built more of. Alfred von Tirpitz urged the construction of both the normal and (*) pocket type of these objects. A 5:5:3 ratio of these objects was fixed at the 1921-22 Washington Arms Conference. A generation of these objects known as "dreadnoughts" were revolutionary for their steam turbines and all-big-gun armaments. For 10 points, name these vehicles that the Germans and British competed to build in an early 20th century naval arms race.

ANSWER: **battleship**s [prompt on **ship**s; prompt on **warship**s] <Gupta>

21. The protagonist of a novel by this author receives a letter containing a $5000 bill, which he refers to as a "portrait of Madison". An affair with Linda Loring and threats from Mendy Menendez complicate the plot of a novel by this author in which the protagonist attempts to keep Roger Wade sober and eventually learns that Paul Marston and Terry Lennox are the same person. The blackmail efforts of Arthur Geiger prompt General Sternwood to hire the protagonist, who learns that Eddie (*) Mars helped Vivian Sternwood conceal her sister Carmen's murder of Rusty Regan, in a novel by this author titled for a euphemism for death. For 10 points, name this author of hardboiled novels like *The Long Goodbye* and *The Big Sleep*, which both star his detective Philip Marlowe.
ANSWER: Raymond **Chandler** [or Raymond Thornton **Chandler**] <Carson>

22. Edmund Morris wrote a semi-fictional biography of this man titled *Dutch*. This man signed the US's first no-fault divorce law into law. This man asked "Will [future generations] look back with appreciated and say, 'Thank God for those people … who headed off that loss of freedom?'" in his "A Time for Choosing" speech. During a debate against an incumbent president, this man asked the audience, "Are you better off than you were four years ago?" As president, this man defeated an (*) air traffic controller strike, launched Operation Urgent Fury against Grenada, and survived an assassination attempt from John Hinckley. For 10 points, name this president who defeated Jimmy Carter to become president in the election of 1980.
ANSWER: Ronald Wilson **Reagan** <Bentley>

23. Madin-Darby canine cells from this organ are commonly used for vaccine manufacture. Drugs like ethacrynic acid and furosemide act on this organ to treat edema and hypertension. Foot processes link podocytes to this organ's basement membrane. Intercalated cells in this organ strongly express sodium-proton antiporters. Calcium oxalate is the major component of a namesake (*) mineral concretion that forms in this organ. ADH stimulates this organ's collecting ducts to express aquaporins for osmoregulation. Countercurrent exchange in this organ through two tubules, an ascending limb, and the descending limb of the loop of Henle moderates glucose, sodium, and water concentration. For 10 points, name this organ whose nephrons filter blood.
ANSWER: **kidney**s [or **glomerulus**] <Silverman>

24. In both of these *two* countries, a football chant was co-opted into a slogan denouncing a political leader as a "dickhead." The colloquial term "little green men" refers to masked soldiers in one of these two countries armed with military equipment provided by the other. One of these two countries routinely demonizes the far-right wing Right Sector party in the other. One of these two countries issued passports to members of the secret police force (*) Berkut after it was dissolved by the other country. Both of these two countries have been blamed for shooting down Malaysian Airlines Flight 17 during their ongoing war in the region of Donbass. For 10 points, name these two countries whose relationship soured when one annexed Crimea from the other.
ANSWER: **Russia** and **Ukraine** [or **Russia**n Federation and **Ukraine**; or **Rossiya** and **Ukrayina**; accept answers listing the countries in either order] <Gupta>

1. This man proposed that an apple falls from the tree because its nature compels it to return to earth and fulfill its final cause, or *telos*. For 10 points each:
[10] Name this Greek philosopher who analyzed why things are the way they are in terms of "four causes." He tutored Alexander the Great and founded the Lyceum a generation after Plato's Academy.
ANSWER: **Aristotle** of Stagira [or **Aristoteles**]
[10] In discussing material versus formal causes, Aristotle claimed the claim that you can't make one of these places by just dumping a pile of bricks somewhere. In an ancient Greek *polis*, each male citizen ran an *oikos* centered around one of these places.
ANSWER: **house**hold [or **home**s; or **estate**s; prompt on **building**s]
[10] When people today say the verb "cause," they mean this third of Aristotle's four causes, the actual instigator which brings about an event. When building a house, the work of a builder to assemble the bricks is this type of cause.
ANSWER: **efficient** causes <Jackson>

2. Answer the following about the economic history of sandalwood, for 10 points each.
[10] In the early 19th century, sandalwood was the chief export of this kingdom, which the Chinese called "Tan Heong Shan," meaning "fragrant sandalwood mountains". Sugar planters backed the Bayonet Constitution in the final years of this kingdom's independence.
ANSWER: Kingdom of **Hawai'i** [or **Hawaii**an Empire]
[10] Sandalwood, silver and this other good were practically the only goods China imported during the 19th century. Unease about British smugglers of this narcotic, which the British grew in India, led to its two namesake wars in China.
ANSWER: **opium** [or **poppy tears**; or **Opium** Wars]
[10] Americans first traded sandalwood obtained from this island group, which was once dominated by King Cakobau of the Bau Kingdom. Mahendra Chaudhry was the first person of Indian ancestry to become prime minister of this Commonwealth nation.
ANSWER: Republic of **Fiji** [or **Viti**] <Bentley>

3. Kenneth Clark wrote that this sculpture ushered in a new age where "the pleasure in the human body once more became a permissible subject of art". For 10 points each:
[10] Identify this first bronze sculpture of an unsupported nude cast since antiquity. It was commissioned by Cosimo de Medici in 1440.
ANSWER: ***David***
[10] *David* was sculpted by this Renaissance master. An earlier statue of David by this artist stood in the Palazzo Vecchio but was later overshadowed by a bigger David by Michelangelo.
ANSWER: **Donatello**
[10] Donatello also made sculptures of Saints Mark and George for the niches of this Florentine church, which was once used as a grain storehouse. Nanni di Banco's *Four Crowned Saints* occupies another niche here.
ANSWER: **Orsanmichele** [or "**Kitchen Garden of St. Michael**"] <Bentley>

4. This equation relates the Hamiltonian operator to the energy operator, the latter of which is given by i times h-bar times d over d-t. For 10 points each:
[10] Name this equation whose Austrian creator also names a thought experiment involving a cat.
ANSWER: **Schroedinger** wave equation
[10] The Schroedinger equation is an example of this general class of equations, which involves the derivatives of functions of more than one variable. Other examples from physics include the heat equation and the general wave equation.
ANSWER: **partial differential equation** [or **PDE**; prompt on partial answer]
[10] One can solve the Schroedinger equation using this semiclassical method, in which the wavefunction is described by an exponential with slowly changing amplitude and phase.
ANSWER: **WKB** approximation [or **Wentzel-Kramers-Brillouin** approximation; or **LG** method; or **Liouville-Green** method] <Neithalath>

5. This man rallies his followers by repeatedly asking "is there still powder in your flasks?" in a battle that sees the death of the hetman Kukubenko. For 10 points each:
[10] Name this Cossack who shoots his son Andriy for betraying him for a Polish girl. He burns numerous towns in revenge for the killing of his son Ostap, before being burned alive himself.
ANSWER: **Taras** **Bulba** [accept either name]
[10] "Taras Bulba" is a story by this Ukrainian author of "The Nose", who wrote about Chichikov's scheme to acquire the rights to deceased serfs in his novel *Dead Souls*.
ANSWER: Nikolai Vasilievich **Gogol**
[10] In this other Gogol story, the ghost of Akaky Akakievich wanders St. Petersburg stealing the title garment after he dies from being ridiculed by a high-ranking official.
ANSWER: "The **Overcoat**" [or "**Shinel**"] <Yu>

6. This person was sent an anonymous e-mail stating, "You asked why I chose you. I didn't. You chose yourself". For 10 points each:
[10] Identify this documentarian who opened her Oscar-winning 2014 film, *Citizenfour*, by reading those and other e-mails concerning government surveillance.
ANSWER: Laura **Poitras**
[10] The aforementioned e-mail was sent by this NSA whistleblower. With the help of journalists such as Glenn Greenwald, this former sysadmin publicized the PRISM program.
ANSWER: Edward **Snowden** [or Ed **Snowden** or Edward Joseph **Snowden**]
[10] Greenwald published some of the first stories based on Snowden's information in this newspaper, which also broke the *News of the World* phone hacking scandal.
ANSWER: *The **Guardian*** <Bentley>

7. In the Exclusion Crisis, Parliament tried to remove this king's brother from the lines of succession due to his Catholicism. For 10 points each:
[10] Name this king of England who came to power in 1660 and presided over the Restoration of the English monarchy.
ANSWER: **Charles II** [or the **Merry Monarch**; prompt on **Charles**]
[10] The Exclusion Crisis unfolded after the Anglican clergyman Titus Oates lied about this conspiracy by claiming that Catholics were planning to kill Charles. This plot gained little traction until Edmund Godfrey, the magistrate to whom Oates gave his "evidence," was found murdered.
ANSWER: **Popish** Plot
[10] This early Whig politician arrested five Catholic Lords pinpointed by Oates as being in on the plot, and cooked up the plan to exclude Charles's brother James. He also furthered the philosophical career of his secretary, John Locke.
ANSWER: Anthony Ashley **Cooper** [or Anthony Ashley Cooper, 1st Earl of **Shaftesbury**; or Sir Anthony Ashley Cooper, **2nd Baronet**; or The **Lord Ashley**] <Gupta>

8. This man takes care of Adele Varens, who was abandoned by her mother, a French dancer. For 10 points each:
[10] Name this husband of Bertha Mason, who marries the title character of a novel after she returns from the house of St. John Rivers.
ANSWER: **Edward** **Rochester** [accept either underlined portion]
[10] Edward Rochester marries Jane Eyre, the protagonist of this woman's most famous novel. This author of *Villette* is the eldest of her sisters.
ANSWER: **C**harlotte **Bronte** [prompt on **Bronte**; prompt on "Currer **Bell**"]
[10] This seamstress, another woman employed by Mr. Rochester, is who Jane originally believes is the source of the sounds on the third floor. This woman turns out to be the caretaker of Bertha Mason.
ANSWER: **Grace** **Poole** [accept either underlined portion] <Sy>

9. This equation could be used to estimate the extent of ionization of ferrous ions to ferric ions in solution. For 10 points each:
[10] Name this equation which can be used to calculate very dilute concentrations of ions, which is why it is applied by glucose sensors and sensitive pH meters. A constant factor of 0.059 is included in this equation at standard conditions.
ANSWER: **Nernst** equation
[10] The concentrations are included in this term of the Nernst equation. When this quantity is larger than the equilibrium constant, Le Chatelier's principle predicts the equilibrium will shift towards the reactants.
ANSWER: **reaction quotient** [or **Q**]
[10] The shift occurs to minimize this quantity at equilibrium. This form of free energy is symbolized G.
ANSWER: **Gibbs** free energy <Silverman>

10. This monster has four eyes, six necks, twelve legs, a cat's tail, and four to six dog heads around its waist. For 10 points each:
[10] Name this woman loved by the fish-like Glaucus. Circe, who loves Glaucus, transforms this woman into a monster in jealousy.
ANSWER: **Scylla**
[10] Scylla eats six crew-members of this hero during his ten-year journey back from Troy chronicled in a namesake epic by Homer.
ANSWER: **Odysseus** [or **Ulysses**]
[10] In some accounts, Scylla was never a beautiful woman, but is spawned in her monster form by this couple, who also beget the Gorgons, the Graeae, and Echidna.
ANSWER: **Phorcys** and **Ceto** [accept in either order; prompt on partial answer] <Kim>

11. A "fleshy" structure of this kind called the galbulus is produced by junipers and cypresses. For 10 points each:
[10] Name these geometrically-elegant reproductive structures consisting of scales arranged spirally in accordance to the Fibonacci ratio, that are produced by the most abundant group of gymnosperms.
ANSWER: **cone**s
[10] Conifer cones produce these structures, consisting of an embryonic plant and surrounding stored food, encapsulated in a coat. Flowering plants use fruits to disseminate these objects.
ANSWER: **seed**s
[10] This living fossil, a unique species of tree in its own order within the gymnosperms, is native to China and has unusually fan-shaped leaves growing on erratic branches.
ANSWER: *__Ginkgo__ biloba* [or **gingko**; or **maidenhair** tree] <Gupta>

12. One symphonic poem by this composer contrasts a theme representing the Sultan with a winding theme first introduced in a violin solo. For 10 points each:
[10] Name this Russian composer, a member of The Five who wrote *Scheherazade* and used hymns from the *Obikhod* in *Russian Easter Festival Overture*.
ANSWER: Nikolai Andreyevich **Rimsky-Korsakov**
[10] This five-movement orchestral suite by Rimsky-Korsakov, which imitates music of the title nationality, has a "Scena e canto gitano" that opens with five cadenzas. It ends with a "Fandango asturiano."
ANSWER: ***Capriccio Espagnol*** [or ***Spanish Capriccio***]
[10] The first and third movements of *Capriccio Espagnol* are this kind of piece played during sunrises. Ravel included one of these "del Gracioso" in *Miroirs*.
ANSWER: **alborada** [or **aubade**] <Kothari>

13. In probability theory, an event is defined as a subset of this space. For 10 points each:
[10] Name this space, which consists of all possible outcomes. For flipping a coin twice, there are four entries in this space.
ANSWER: **sample** space
[10] Since the set of outcomes for flipping a coin twice has this property, one defines a probability mass function over it, and not a density function. This word is often considered to be the opposite of continuous.
ANSWER: **discrete**ness [accept word forms]
[10] This quantity is defined as the sum over all elements of the probability that an event occurs times the event's value. The square of this quantity and a squared random variable's value for this quantity appears in the definition for variance.
ANSWER: **expected value** [accepted word forms, such as **expectation value**; do not accept or prompt on the "mean"] <Jose>

14. Song dynasty scholar Su Shi contemplates a poem about the "bright moon" in the first of his *fu* titled for this place, which he often traveled to while in exile. For 10 points each:
[10] Name this site of a climactic battle in which Liu Bei's advisor Zhuge **("joo-guh")** Liang supposedly uses magic to summon an out-of-season southeasterly wind, and Sun Quan's **("chwan's")** general Huang Gai pretends to defect in order to set fire to the villain's navy.
ANSWER: **Red Cliff**s [or **Chi Bi**]
[10] The losing side at the battle of Red Cliffs was led by this villainous general, whose son Pi founds the kingdom of Wei later in the novel.
ANSWER: **Cao Cao** [prompt on partial answer; pronounced "tsow tsow" but accept a literal English reading like "cow cow"; accept **Cao Mengde**]
[10] The Battle of Red Cliffs is fictionalized in this 14th century Chinese novel by Luo Guanzhong about the wars at the end of and after the Han dynasty. Its major focus is on the battles between Wei, Wu, and Shu.
ANSWER: *The **Romance of the Three Kingdoms*** [or ***Sanguo yanyi**;* accept **ROTK**] <Yu>

15. The *News of the World* ran an editorial claiming that this "evil star" deliberately French kissed his *Dynasty* co-star Linda Evans in order to give her his disease. For 10 points each:
[10] Identify this Hollywood star whose 1985 death helped draw attention to the AIDS epidemic.
ANSWER: Rock **Hudson** [or Roy Harold **Scheer**, Jr.; or Roy Harold **Fitzgerald**]
[10] Hudson managed to avoid this fate of many other Hollywood professionals at the height of the Red Scare. This term refers to bans on employing people with suspected ties to Communism.
ANSWER: **blacklist**ing [or being put on the Hollywood **Blacklist**]
[10] Dalton Trumbo was among a set of this many Hollywood screenwriters who were blacklisted for refusing to answer questions at a HUAC hearing. The Constitutional amendment of this number reserves powers not delegated by the Constitution to the states or the people.
ANSWER: **ten** [or Hollywood **Ten**; or **Ten**th Amendment to the United States Constitution] <Bentley>

16. The "second wave" of this movement included anti-pornography advocates Andrea Dworkin and Catherine MacKinnon, who described the world power structure as a "patriarchy". For 10 points each:
[10] Name this movement for greater political, economic, and social equality, whose pioneers included Mary Wollstonecraft.
ANSWER: **feminism** [or **women's rights** movement; or **women's liberation** movement]
[10] This conservative woman fought against feminist efforts for an Equal Rights Amendment to the US Constitution. Her son Andrew runs Conservapedia.
ANSWER: Phyllis **Schlafly**
[10] This black author of *Sisters of Yam,* who used a Sojourner Truth quote to title her book *Ain't I a Woman,* writes about the intersection of black and third-world identities with feminism using an uncapitalized pen name.
ANSWER: bell **hooks** [or Gloria Jean **Watkins**] <Jackson>

17. Paul O'Rourke, a man in this profession, has his identity stolen by a religious group that thinks that he's an "Ulm" in Joshua Ferris' novel *To Rise Again at a Decent Hour.* For 10 points each:
[10] Identify this profession shared by an inhabitant of San Francisco who kills his wife Trina to access her lottery winnings and ultimately dies of exposure after being handcuffed to Marcus Schouler in Death Valley.
ANSWER: **dentist**s [accept word forms like **dentistry**]
[10] The latter dentist is the title character of *McTeague,* a novel by this American naturalist. His planned *Epic of the Wheat* trilogy includes a novel in which Laura Dearborn marries Curtis Jadwin, who becomes obsessed with grain speculation and trading, called *The Pit.*
ANSWER: Frank **Norris** [or Benjamin Franklin **Norris**, Jr.]
[10] This first novel in the *Epic of the Wheat* was inspired in part by the Mussel Slough Tragedy. In it, Magnus Derrick leads a league of wheat farmers opposed to the expansion of the Pacific & Southwestern Railroad, which is analogized to the title animal.
ANSWER: *The **Octopus*** <Bentley>

18. Answer the following about 17th century artists who used dramatic lighting, for 10 points each.
[10] Light emerges from an unseen window to the right of the canvas in this Italian Baroque artist's *The Calling of Saint Matthew.*
ANSWER: **Caravaggio** [or **Michelangelo Merisi**; do not prompt on just "Michelangelo"]
[10] Caravaggio and Artemisia Gentileschi both painted eerily lit versions of this bloody scene from the Apocrypha, in which one title character decapitates the other after seducing her way into his tent.
ANSWER: **Judith** beheading **Holofernes** [or **Judith** and **Holofernes**; or **Judith** Slaying **Holofernes**]
[10] Representative canvases by this French artist include *St. Joseph the Carpenter* and a painting where Saint Jerome holds a candle to the piece of paper he's reading.
ANSWER: Georges de **La Tour** <Bentley>

19. After each of these events, Moses would ask "Let my people go," and after all but the last one, Pharaoh would refuse. For 10 points each:
[10] Name these divine punishments which preceded the Exodus of the Israelites. They included a swarm of locusts, a cloud of darkness so thick that people could touch it, and the death of every Egyptian first-born son.
ANSWER: the ten **plague**s of Egypt
[10] Before the tenth plague, Israelites marked their doors with this substance so that the Angel of Death would know to pass over them -- hence the term "Passover."
ANSWER: **lamb**'s **blood** [prompt on **blood**]
[10] In the Book of Exodus, this metaphor describes what God did to make Pharaoh stubborn and unwilling to listen to Moses or Aaron each time they pleaded for the Israelites' freedom.
ANSWER: his **heart** was **hard**ened [or the LORD **harden**ed Pharaoh's **heart**] <Jackson>

20. One account says that the losing commander in this battle perished when the hut he was hiding in burned down. For 10 points each:
[10] Identify this battle where Valens was killed by forces under Fritigern.
ANSWER: Battle of **Adrianople** [or Battle of **Hadrianopolis**]
[10] The Romans at Adrianople were defeated by an army of the Eastern branch of these "barbarians," whose Western branch gained control of Italy under Theodoric the Great. A leader of these people, Alaric, sacked Rome in 410.
ANSWER: **Goths** [or **Ostrogoth**s or **Visigoth**s]
[10] The successor of Valens, Theodosius, made this council's version of Christianity into Rome's official religion. This euecmenical council, held in 325, condemned Arianism and resulted in the creation of a namesake creed.
ANSWER: First Council of **Nicaea** <Bentley>

21. At one meeting, this faction's views were defended by their spokesman Thomas Rainsborough. For 10 points each:
[10] Name this political movement prominently supported by John Lilburne, which published the *Agreement of the People*. They weren't as extreme as the Diggers, whose demands for equality among male Englishmen went even further.
ANSWER: **Levellers**
[10] The *Agreement of the People* was rejected by the New Model Army in favor of the more conservative *Heads of Proposals* at this series of debates in 1647.
ANSWER: **Putney** Debates
[10] The New Model Army fought for this legislative body, and against the king, in the English Civil War.
ANSWER: English **Parliament** <Wang>

22. This character wakes up thinking of the word "Shakespeare" after dreaming of a sunny pasture called the "Golden Country". For 10 points each:
[10] Name this man who betrays his lover when he is threatened with a "common punishment in Imperial China," a wire cage full of rats.
ANSWER: **Winston Smith** [accept either underlined portion]
[10] Winston Smith is tortured by O'Brien in this dystopian novel by George Orwell.
ANSWER: ***Nineteen Eighty-Four*** [or ***1984***]
[10] During the torture, O'Brien presents Winston with a photo exonerating three former Inner Party members of the crimes for which they were executed, and Winston recalls seeing them in the Chestnut Tree Café before their deaths. Name any one of them.
ANSWER: **Jones** [or **Aaronson;** or **Rutherford**] <Yu>

23. The K type of these devices is composed of mainly chromium and aluminum. For 10 points each:
[10] Name these sensitive temperature monitors that work according to the Seebeck effect. They register a voltage when the temperature is changed, due to an internal junction of two different conductors.
ANSWER: **thermocouple**s
[10] The Seebeck effect is a result of a difference in this quantity for the two conductors. This quantity is the amount of energy required to excite an electron from the surface of a metal in the photoelectric effect.
ANSWER: **work function** [prompt on **phi**]
[10] The photoelectric effect was first identified by this German physicist, who placed a spark gap in a box and applied UV radiation. The SI unit of frequency is named for him.
ANSWER: Heinrich **Hertz** <Silverman>