

2015 NSC - Official Scoresheet

Round	11	Room	
Bracket			
Reader			

Team									Team								
Player Names																	
Q#					Bonus	Steals	Ques. Total	Run. Score						Bonus	Steals	Ques. Total	Run. score
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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
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PACE NSC 2015 - Round 11 - Tossups

1. El Greco painted at least six versions of a scene where this man weeps in prayer while an angel sits on an unoccupied grave in the background. He's not St. Matthew, but a woman and a soldier join this man in pointing a finger at himself in a Caravaggio painting. This man kneels and receives the title objects in front of an octagonal temple in a painting by Pietro Perugino. In a cycle of paintings of this figure partially executed by Masolino, he is shown baptizing the (*) Neophytes. This man appears three times in a mural in the Brancacci Chapel whose left-most scene depicts him catching a fish. That mural is Masaccio's *The Tribute Money*. For 10 points, name this apostle who Perugino painted receiving the keys to the church, thus making him the first Pope.

ANSWER: Saint Peter [or Simon Peter; prompt on Simon] <Bentley>

2. The speaker of a poem in this collection desires to "plant on you for the first time the lips of a determin'd man" and asks "What is this that frees me so in storms?" A poem in this collection compares the speaker's soul "surrounded, in measureless oceans of space" to a creature standing "on a little promontory" which launches "filament, filament, filament, out of itself". "One Hour to Madness and Joy" and "A (*) Noiseless Patient Spider" are found in this collection, later editions of which added a poem that opens by describing how "the great star early droop'd in the western sky" and mourns the death of Abraham Lincoln. For 10 points, name this collection that includes "When Lilacs Last in Dooryard Bloom'd" and "Song of Myself", and was written by Walt Whitman.

ANSWER: Leaves of Grass <Cheng>

3. During this event, its organizer was treated by a doctor named Nelson for his malaria, which forced him to be carried in a litter. This event was publicized by the journalist Edgar Snow, who interviewed its leaders in its aftermath. The heavily mythologized Battle of Luding Bridge occurred as part of this event, during which the German adviser Otto Braun lost influence in the (*) Zunyi Conference. A year after this event, hostilities temporarily ceased when the Second United Front was formed to fight the Japanese. It began after 130,000 soldiers and civilians escaped the Encirclement Campaigns in the Jiangxi Province, and ended when several thousand troops reached the Shaanxi Province. For 10 points, name this 1935 to 1936 "March" of Chinese Communist forces led by Mao Zedong.

ANSWER: Long March of the Red Army [or Hongjung Chang Zheng] <Wang>

4. These creatures fight King Arthur's army concurrently with a game of chess during a bizarre dream of Rhonabwy. This animal form is the most frequently one assumed by a wounded deity that becomes healed after offering a tired hero three drinks of milk. One of these animals approaches a dying hero who is trying to keep himself upright by tying his body to a tall rock. The Morrigan most frequently assumes this (*) bird form, such as when she perches on Cu Chulainn's shoulder to foreshadow his death. Odin is brought news from all over the world by two of these birds that personify thought and memory. This bird doubles as a creator god and as a trickster god in many Native American cultures. For 10 points, name this bird which often portends death due to its black color.

ANSWER: ravens [or crows; prompt on birds until mentioned] <Kim>

5. A dry-land-set painting by Thomas Eakins shows men competing in this sport in front of a man using a rowing machine. In *The World According to Garp*, Garp is murdered while acting as Ernie Holm's replacement in this sport. The Achaeans get bored of watching this sport at the funeral games for Patroclus, so Achilles declares that Ajax the Greater and (*) Odysseus both win. In Japanese lore, kappa sometimes challenge their victims to this sport. Paul Gauguin's *Vision after the Sermon* depicts two characters engaging in this sport; that painting was inspired by a Biblical instance of it in which one competitor gets his hip dislocated. For 10 points, name this sport that results in Jacob being renamed Israel after competing with an angel.
ANSWER: wrestling [or word forms; or sumo wrestling] <Mehigan>

6. The Stone-Weierstrass theorem proves the existence of a uniformly converging series of these things. Runge's phenomenon arises when using these functions to interpolate, so combinations of them called splines are often used instead. If two functions of this type are equal at infinitely many points, then they are the same, a fact that follows from the (*) fundamental theorem of algebra. Differentiable functions can be locally approximated as these functions using Taylor expansion. Rational functions are the ratio of two of them. When you multiply two of them together, the degree of the new function of this type is the sum of the degrees of the previous two. For 10 points, what functions contain sums of coefficients times powers of variables, like two x^3 plus x^2 ?
ANSWER: polynomials <Schindler>

7. The polytropic index for an ideal gas undergoing an isothermal process equals this number. The Hill coefficient for myoglobin binding oxygen is closest to this number. The sum of spin equals this number for a triplet state. In high-temperature proton NMR, cyclohexane has this many peaks. The Lyman series corresponds to this value for N in the Rydberg equation. This value is the van't Hoff factor for (*) glucose. This number is the most common oxidation state of silver. p orbitals have at most this angular momentum quantum number. Hypochlorite has this many oxygen atoms. In Daltons, this is the weight of a hydrogen atom. For 10 points, give the number of neutrons in deuterium, or the number of protons in hydrogen.
ANSWER: one [or equivalent] <Silverman>

8. One of this author's protagonists finds a letter addressed to a person in Germany in the captain's cabin of the *Esperança*, but burns it rather than turning it in to the authorities. This author, who divided his literary output into "novels" and "entertainments", created a character who is blackmailed into diamond smuggling after Yusef discovers his affair with Helen Rolt. Another of this author's protagonists befriends Mr. Tench and (*) Coral Fellows, but is betrayed by the *mestizo*. Major Henry Scobie commits suicide at the end of one novel by this author, while in another novel a police lieutenant travels across Mexico in pursuit of an unnamed "whisky priest". For 10 points, name this English Catholic author of *The Heart of the Matter* and *The Power and the Glory*.
ANSWER: Graham Greene [or Henry Graham Greene] <Carson>

9. A politician with this surname made his fortune in the screw business and won the support of the "Birmingham caucus" as mayor of that city. A politician with this surname spent his early career on the sisal plantation in the Bahamas belonging to his father, Joseph, who loudly supported Britain's entry into the Second Boer War as Colonial Secretary. A British politician with this surname won the Nobel Peace Prize for negotiating the Locarno Treaties. The half-brother of (*) Austen with this surname succeeded Stanley Baldwin and assented to the annexation of the Sudetenland. For 10 points, give the surname of the British Prime Minister who promised "peace for our time" after signing the Munich Agreement with Hitler and was criticized for his policy of "appeasement."
ANSWER: Chamberlain <Bentley>

10. One million people attended a rally at the city of Grozny to protest the activities of this company. This company was sued for wrongful termination after firing an employee who cited a rumor that a political leader's son was going to convert to Judaism before marriage. The Republican Marches happened in solidarity with this company, whose employee Sigolene (*) Vinson was spared by men who said "I'm not killing you because you are a woman." Two days after an attack on this company, Amedy Coulibaly took several hostages at a kosher supermarket. Supporters of free speech rallied behind the slogan "Je suis" [this company]. For 10 points, name this satirical French magazine that was targeted by a 2015 terrorist attack for its cartoons depicting Muhammad.

ANSWER: Charlie Hebdo [or Charlie Weekly; prompt on "Charlie"] <Gupta>

11. Anyone who recites a chapter telling the story of the seven sleepers of Ephesus on this day will be blessed until the next iteration of this day. Muhammad al-Bukhari reports that on this day, angels guard the gates of mosques and record the name of entrants on a scroll in chronological order. It's not an Eid, but sermons known as Khutbah are said on this day, and edifices known as Jama Masjid are specifically built for services on this day. On this day, the dhuh (*) prayer just after noon is replaced by the Jumu'ah, which is part of a service that all Muslims are obligated to attend. Most Muslim countries have made this day the legal day of rest. For 10 points, name this day of the week, the holiest in Islam.

ANSWER: Friday [or Jumu'ah until it is read; prompt on Islamic Sabbath or related answers] <Gupta>

12. A style of arpeggiated lute music from this country has a name that translates to "broken style." A type of overture named for this country had a slow part in dotted rhythms and a fast fugato part. A composer from this country included pieces such as "The Cyclopes" and "The Hen" in his five suites of harpsichord pieces and wrote *Treatise on Harmony*. Another included pieces like "The Mysterious Barricades" in his four books of harpsichord pieces and also wrote *The (*) Art of Playing the Harpsichord*. Opera in this country was founded by an Italian-born composer who died from stabbing himself with a conducting staff. The bourrée and gavotte are dances from here. For 10 points, name this country home to the Couperin family, Jean-Baptiste Lully, and Jean-Philippe Rameau.

ANSWER: France <Kothari>

13. The key figure in this event said its effect on the world was "like a match lighting a bonfire." Harry F. Knight and Harold Gatty put up much of the funding needed to accomplish this action, which its achiever chronicled just weeks later in a popular memoir entitled "*WE*". A 25,000-dollar reward from the owner of the Lafayette and Brevoort hotels known as the (*) Orteig Prize was awarded for this feat, which relied on an engine known as the Wright Whirlwind. The man who accomplished this feat later became the spokesman for the isolationist America First Committee, and lost his baby a half-decade later to a kidnapper. For 10 points, name this feat which ended at Le Bourget field, a 1927 solo aeronautic feat done in *The Spirit of St. Louis*.

ANSWER: Charles Lindbergh's transatlantic flight [or Charles Lindbergh's flight from New York to Paris; or the first transatlantic flight; or the first flight from New York to Paris; or the first flight from North America to Europe; accept winning the Orteig Prize before "Orteig"] <Bentley>

14. A novel set in one of these places features Thady Quirk, an early example of an unreliable narrator, and was written by Maria Edgeworth. A group of otherwise-mute travelers are able to only speak with tarot cards in a novel titled for one of these places written by Italo Calvino. The protagonist of a novel titled for one of these structures is assigned the assistants Arthur and Jeremiah and uses the messenger Barnabas in his many efforts to schedule a meeting with (*) Klamm. That example of these structures is located near the Herrenhof Inn, where a land-surveyor struggles against the endless bureaucratic roadblocks it produces. For 10 points, a man named K. tries to enter what type of structure in an unfinished novel by Franz Kafka?

ANSWER: castles [accept Castle Rackrent or *The Castle of Crossed Destinies* or *The Castle* or *Das Schloss*] <Jose>

15. In prokaryotes, this process is down-regulated by the binding of GATC sequences to SeqA. During this process, three molecules of PCNA act as a "sliding clamp" holding an enzyme to its substrate. This process starts at regions denoted "ori," and is performed by an enzyme that yields the Klenow fragment when cleaved. By growing *E. coli* in media with the 14 and 15 isotopes of nitrogen, the (*) Meselson-Stahl experiment demonstrated that this process was semiconservative. In this process, which takes place during the S phase of the cell cycle, the enzyme ligase I joins Okazaki fragments on the lagging strand, which diverges from the leading strand at this process's namesake fork. For 10 points, name this process of making two identical copies of one DNA molecule.

ANSWER: DNA replication <Gupta>

16. In 2008, Giulio Pozzo substituted a biprism for these objects in a single-electron experiment first hypothesized by Richard Feynman. The intensity distribution from a single one of these objects in the Fraunhofer setup is proportional to the sine squared of half the phase shift. A grating contains a large number of them. The distance (*) between these objects, multiplied by the sine of the angular distance theta, will be either a half-integer or whole-integer multiple of the wavelength. According to complementarity, it's impossible to ascertain which of these things a photon passed through. For 10 points, name these objects which diffracted light onto a screen in an experiment conducted by Thomas Young.

ANSWER: double slits <Silverman>

17. The historic Hotel Evropa was demolished in the riots following this event. This event was planned by a colonel who had overthrown King Alexander and Queen Draga in a military coup 11 years earlier, codenamed "Apis." During this event, which took place at the northern end of the Latin Bridge, a man begged Sophie to "live for our children." One of this event's planners failed to commit suicide by swallowing (*) expired cyanide and jumping into a shallow river. It sparked the July Crisis, during which the aggrieved country issued an intentionally unreasonable ultimatum in an attempt to provoke war. This event was perpetrated by a member of the Black Hand terrorist group named Gavrilo Princip. For 10 points, name this 1914 event in Sarajevo that sparked the first World War.

ANSWER: assassination of Franz Ferdinand [accept equivalents that include Franz Ferdinand and the act of killing or murdering him; prompt on partial answers] <Wang>

18. Joseph Koch decorated four rooms devoted to this author in the Villa Massimi. A character created by this author bites his own fingers as he's embraced by some naked youth in a sculpture by Jean-Baptiste Carpeaux. He's not François Villon, but this author provided the source material for a sculpture of an elderly former model who stares at the ground titled *The Old Courtesan*, and for the Atlas-like man in the sculpture (*) *I Am Beautiful*. A man bites the bow of a ship as this author, wearing a red hood, recoils in horror in an 1822 painting by Eugene Delacroix titled for his "barque." In a sculpture inspired by this author, a man holds his hand to his chin in a thinking pose. For 10 points, name this author whose work inspired Rodin's *The Gates of Hell*.

ANSWER: Dante Alighieri [or Durante degli Alighieri] <Bentley>

19. A character in this play describes hearing an oracle commanding him to "Gore them like a bull!" In this play, a morose nurse gives a speech about how babies must be taken care of because they cannot think for themselves. A speech by this play's chorus begins "Oh, the torment bred in the race." Two men speak like Parnassians to gain access to the royal palace in this play, in which a woman dreams of a (*) snake that drinks milk from her breast, then bites her, drawing blood. This play opens with the disguised protagonist approaching his father's grave with Pylades and placing two locks of hair on it, after which he is recognized by his sister Electra. For 10 points, name this play in which Orestes kills Aegisthus and Clytemnestra, the second in Aeschylus's *Oresteia*.

ANSWER: *The* Libation Bearers [or Choephoroi] <Sy>

20. This man harshly attacked the doctrine of "probabilism" in the first of a set of eighteen writings for which he used the pseudonym Louis de Montalte. This man sewed a page of writing into his coat to remember his "night of fire," a transformative mystical experience. This man jumped into the formulary controversy by defending Antoine Arnauld and the Port Royal abbey, whose religious views were under threat. He argued in posthumously-published writings that the prospect of eternal (*) damnation is so bad that it's safer to receive the sacraments even if one is skeptical. For 10 points, name this author of the pro-Jansenist *Provincial Letters*, a French philosopher and mathematician whose *Pensees* (pahn-SAYz) include a namesake theological "wager."

ANSWER: Blaise Pascal <Jackson>

21. An author who returned to this country, his ancestral homeland, in 1935 made his name with the novel *Wolf Solent*. An author from this country wrote about people who "though they sink through the sea they shall rise again" in a poem that describes a time when "though lovers be lost love shall not". A character from this adopted home of John Cowper Powys (COO-per POW-iss) holds Edmund Mortimer captive and proposes lending his (*) magic to Hotspur's rebellion in *Henry IV, Part 1*. A poet from this country wrote "And death shall have no dominion" and a poem that urges the addressee to "Rage, rage against the dying of the light". For 10 points, name this country, the birthplace of Owen Glendower and the author of "Do not go gentle into that good night", Dylan Thomas.

ANSWER: Wales [or Cymru; prompt on Great Britain or the United Kingdom or the U.K.; do not accept or prompt on "England"] <Carson>

22. Soldiers adhering to this religion prayed to a goddess of light and the sun named Marici before battles. People float paper lanterns down a river at the culmination of a three-day summer festival in this religion for honoring ancestors, called Obon. Atop Mount Hiei, many members of this religion's clergy trained for combat. Two esoteric schools of this religion, introduced by Kukai and Saicho, were respectively known as (*) Shingon and Tendai. Practitioners of one form of this religion strive to attain an initial insight known as kensho, or satori, and practice the contemplation of statements and questions known as koans. For 10 points, name this religion which has blended heavily with Shinto in Japan, where the "Zen" type is particularly popular.

ANSWER: Buddhism [accept specific types, such as Zen Buddhism] <Gupta>

23. One person at issue during this event was Charles Maultsby, who veered off-course and got lost. A telegram whose first three words were "YOUR ACTION DESPERATE" was sent during this event by Bertrand Russell. An operation misleadingly codenamed with the place name Anadyr preceded this event, which was chronicled in the memoir *Thirteen (*) Days*. The claim "I am prepared to wait until Hell freezes over" was made by UN Ambassador Adlai Stevenson during this event, which inspired the creation of a "hotline" between two world capitals. It was resolved when the Americans agreed to secretly remove its Jupiter weapons from Turkey. For 10 points, name this tense period in 1962 which began when nuclear weapons were discovered in a country ruled by Fidel Castro.

ANSWER: Cuban Missile Crisis [prompt on October Crisis] <Bentley>

24. Aldosterone-sensitive HSD2 neurons are located in the solitary nucleus within this structure, which has a pair of swellings known as olivary bodies. Adolf Wallenberg names a syndrome characterized by frequent, violent hiccups which results from lateral damage to this structure. This region is home to paired white matter structures which decussate, known as the pyramids. The central chemoreceptors of this structure detect (*) pH changes caused by altered O₂ or CO₂ concentration. The area postrema within this structure controls vomiting. This structure is situated between the pons and the spinal cord. For 10 points, name this part of the brain stem that controls involuntary functions like breathing and heart rate.

ANSWER: medulla oblongata [or word forms, such as medullary; prompt on brain stem until it is mentioned] <Gupta>



PACE NSC 2015 - Round 11 - Bonuses

1. Augustine's three-part dialogue on this concept is a dialogue between himself and a man named Evodius. For 10 points each:

[10] Name this proposed ability of the human mind to make unrestricted choices. Determinists believe that humans do *not* have this, since mental decisions are pre-ordained by outside factors.

ANSWER: **free will** [or **free choice** of the **will**; or **freedom** of the **will**; or **liberty** of the **will**; or **liberum arbitrium**; or De **libero arbitrio**; do not accept partial answers]

[10] This 19th century German philosopher warned that we can *do* what we will, but we cannot *will* what we will. He also proposed that the universe consists largely of a single unknowable will which is a "thing-in-itself" apart from objects represented before our senses. He wrote *On the Four Fold Root of the Principle of Sufficient Reason*.

ANSWER: Arthur **Schopenhauer**

[10] This is the contemporary term for people who believe that free will can exist even though physical determinism is true. The author of *On Truth*, Harry Frankfurt, defended this viewpoint.

ANSWER: **compatibilism** [or word forms, such as **compatibilist**] <Jackson>

2. Lera Boroditsky is a cognitive scientist pushing for a weak form of this hypothesis known as linguistic relativity. For 10 points each:

[10] Name this controversial hypothesis positing that the particular way each language encodes information shapes the way its speakers think.

ANSWER: **Sapir-Whorf** hypothesis

[10] Part of the controversy can be traced to Whorf's claim that the Hopi have no sense of this concept. It is spatially mapped to east-west in Australian aboriginal languages, and up-down in Mandarin. English speakers typically think of this concept as progressing from the past to the future or left to right.

ANSWER: **time**

[10] Across all languages, people metaphorically refer to time using spatial language, implying people also think about time spatially. Conceptual metaphors, such as "time is space", were first introduced by this cognitive scientist and Mark Johnson in *Metaphors We Live By*.

ANSWER: George **Lakoff** <M. Zhang>

3. A black bird perches on a felled tree as a man walks into the woods in this artist's *The Chasseur in the Forest*. For 10 points each:

[10] Identify this Romantic artist of *The Cross in the Mountains* and *Wanderer above the Sea of Fog*.

ANSWER: Caspar David **Friedrich**

[10] Caspar David Friedrich was an artist from this modern-day country. The Degenerate Art exhibition in this country in the 1930s derided Jewish or Jewish-leaning art like that by Max Beckmann.

ANSWER: **Germany** [or Federal Republic of **Germany**]

[10] Friedrich's *Rückenfigur* paintings include one of a "Woman at" one of these things. Rene Magritte's *The Human Condition* consists of an easel seamlessly blending into one of these things.

ANSWER: an open **window** [prompt on **landscape**; prompt on **wall**] <Bentley>

4. For 10 points each, answer some questions about tissue culture.

[10] Many tissue cultures grow inside a liquid media containing 10% FBS, which consists of serum collected from the hearts of these animals.

ANSWER: **cows** [or **bovines**; or fetal **bovine** serum; or fetal **calf** serum; or **calves**; or **Bos taurus**]

[10] Changing the media typically involves aspiration using a vacuum system connected to a glass pipet named after this scientist, who is better known for disproving spontaneous generation, and for developing a namesake method of sterilizing milk.

ANSWER: Louis **Pasteur** [or **pasteurization**]

[10] Cells may be cultured on a liquid medium or on a bed of solid agar inside this piece of lab equipment, a shallow cylindrical container named for a bacteriologist.

ANSWER: **Petri dish** [prompt on **cell-culture dish**] <Smart>

5. This set of islands lies northeast of a set of islands resembling a leaf called the Palm Jumeirah. For 10 points each:

[10] Name this stalled construction project, a set of man-made islands resembling the shapes of many nations. As of 2013, Nakheel Properties has managed to sell only two of its constituent islets and hasn't developed many more than that.

ANSWER: The **World** [or **World Islands**]

[10] The World is off the coast of this booming city in the United Arab Emirates, which is also home to the sail shaped Burj al-Arab and the extremely tall Burj Khalifa.

ANSWER: **Dubai**

[10] A majority of all residents in the UAE are foreign laborers from this country and its smaller western and eastern neighbors.

ANSWER: Republic of **India** [or Ganarajya **Bharat**] <Jackson>

6. This character describes "the eyes that fix you in a formulated phrase" leaving him "pinned and wriggling on the wall" in a poem in which he also laments "I should have been a pair of ragged claws / scuttling across the floors of silent seas". For 10 points each:

[10] Name this character who asks questions like "Do I dare to eat a peach?" and "Do I dare / Disturb the universe?" in a T. S. Eliot poem about his "love song".

ANSWER: J. **Alfred Prufrock** [accept either underlined portion; accept "The **Love Song of J. Alfred Prufrock**"]

[10] Two standalone couplets in the poem note that "In the room the women come and go" while performing this three-word activity.

ANSWER: "**talking of Michelangelo**"

[10] Prufrock later decides to "walk upon the beach" and hear these creatures sing to each other, but he notes that "I do not think that they will sing to me."

ANSWER: **mermaids** <Kim>

7. Answer the following about industrial disasters in recent history, for 10 points each.

[10] A gas leak in a pesticide plant in this India town killed over 20,000 people in 1984. In 2010, an Indian court convicted former executives at a Union Carbide subsidiary of negligence due to the disaster in this town.

ANSWER: **Bhopal**, India

[10] In 2013, a factory producing these types of goods collapsed in Dhaka in Bangladesh. In the 19th century, the British placed heavy tariffs on these types of goods made in India and encouraged Indians to import British goods of this kind made in factories with industrial looms.

ANSWER: **textiles** [or **clothes**; or **garments**; or **fabrics**]

[10] In the early 1970s, at least 650 people in this country were poisoned by grain accidentally coated with methylmercury. In 1958, the 14 July Revolution overthrew the monarchy of this country, which won the battle of Khorramshahr in 1980.

ANSWER: Republic of **Iraq** <Bentley>

8. Fishing was an important industry in ancient Roman times, yes it was. For 10 points each:

[10] Costumes for these people included the trident-wielding *retiarius* and the fish-helmeted *murmillio*. These slaves often wore stereotyped costumes when fighting in facilities such as the Colosseum.

ANSWER: **gladiators**

[10] Many Roman elites kept private fishing ponds in these luxurious country homes. The one built for Hadrian in present-day Tivoli is particularly large.

ANSWER: **villas**

[10] In the ancient world, many fish had their intestines ground up and fermented to make this ubiquitous culinary sauce, which was put on pretty much any food.

ANSWER: **garum** [or **liquamen**] <Jackson>

9. The fictional Urania Cabral returns to this nation years after she had been offered up to its notorious dictator by her father in the 2000 novel, *The Feast of the Goat*. For 10 points each:

[10] Identify this nation, the birthplace of the author of *The Brief Wonderful Life of Oscar Wao*, Junot Diaz.

ANSWER: the **Dominican Republic** [or **República Dominicana**]

[10] *The Feast of the Goat* was written by this Peruvian Nobel Laureate. Jaguar leads the Circle at the Leoncio Prado Military Academy in his novel *The Time of the Hero*, and he also wrote *Aunt Julia and the Scriptwriter*.

ANSWER: Mario **Vargas Llosa** [or Jorge Mario Pedro **Vargas Llosa**, 1st Marquis of Vargas Llosa]

[10] The second title character of *Aunt Julia and the Scriptwriter* is this eccentric Bolivian, whose increasingly bizarre radio *novela* scripts make up a portion of the novel.

ANSWER: **Pedro Camacho** [accept either underlined portion] <Bentley>

10. A control system has this property if the amplitude ratio is less than one when the frequency is at negative 180 degrees on a Bode plot. For 10 points each:

[10] Name this property that is possessed by an equilibrium if the second derivative of the potential energy is positive.

ANSWER: **stability** [or word forms]

[10] Any shift to an object in stable equilibrium will cause this point to increase in elevation. This point is equivalent to the centroid for uniform geometric objects in a uniform gravitational field.

ANSWER: **center of gravity** [or **CG**; or **center of mass**]

[10] Using the center of gravity and barycentric coordinates makes problems involving this many bodies much easier. The attractive force between this many bodies is described by Newton's law of universal gravitation.

ANSWER: **two** [or obvious equivalents] <Silverman>

11. Cryptographer Etienne Bazieres cracked the "Great Cipher" and deduced that this man was a general named Viven de Bulonde who ordered a dishonorable retreat from the Siege of Cuneo. For 10 points each:

[10] Name this mysterious prisoner who died in the Bastille in 1703.

ANSWER: the **man in the iron mask** [or **l'homme au masque de fer**]

[10] Voltaire advanced the unlikely theory that the man in the iron mask was the illegitimate older brother of this long-reigning French king, who moved the French court from Paris to Versailles.

ANSWER: **Louis XIV** [or **Louis le Grand**; or **Louis the Great**; or the **Sun King**; or le **Roi-Soleil**; prompt on **Louis**]

[10] Another candidate, Eustache Dauger, escaped punishment for his role in this scandal, in which numerous aristocrats, including Louis's mistress Madame de Montespan, were found to have solicited fortune tellers for black masses, murder weapons, and witchcraft.

ANSWER: **Affair of the Poisons** [or **L'affaire des poisons**] <Bentley>

12. This quantity is equal to RT over the molar volume, times the sum of the log of activity coefficient times mole fraction. For 10 points each:

[10] Name this quantity which is estimated as molarity times RT by the Morse equation. It is equivalent to the height difference between two halves of dialysis tubing separated by a semipermeable membrane.

ANSWER: **osmotic pressure** [or **π** ; prompt on **pressure**]

[10] In this process, the pressure driving force must be greater than the osmotic pressure. In this most-common method of industrial desalination, water is transported against its concentration gradient.

ANSWER: **reverse osmosis** [or **RO**; do not accept or prompt on "osmosis"]

[10] The "back" form of this process complicates reverse osmosis due to a concentration polarization. Osmosis is a type of this form of mass transport which freely occurs along a concentration gradient.

ANSWER: **diffusion** [or **diffusive** flux; or back **diffusion**] <Silverman>

13. This document promised votes on ten key bills, such as the Taking Back Our Streets Act and the Personal Responsibility Act, within the first 100 days of the 104th United States Congress. For 10 points each:

[10] Name this document signed onto by over three hundred Republican congressional candidates, foremost among them Newt Gingrich.

ANSWER: **Contract with America**

[10] The Contract with America helped the Republicans earn massive Congressional victories in this calendar year, the first in which midterm elections were weathered by sitting President Bill Clinton.

ANSWER: **1994**

[10] They day after a similar "wave election" occurred in 2010 during Barack Obama's first term, Obama used this expressive word to indicate the heavy losses that he, and by extension his party, took.

ANSWER: "take a **shellacking**" [accept word forms such as **shellacked**] <Jackson>

14. These creatures steal the food lain out for the blind prophet Phineus until they are chased away by the Boreads, Zetes and Calais. For 10 points each:

[10] Name these monsters with the body of a bird and the head of a human.

ANSWER: **harpies** [or **harpy**; or **harpyia**]

[10] After the harpies are dispersed, Phineus thanks the Argonauts by instructing Jason to use a dove to accomplish this task, which enables the Argonauts to arrive at Colchis safely.

ANSWER: pass the **Symplegades** [or pass the **Clashing Rocks**; prompt on pass the **rocks**]

[10] The first stop on the Argonauts' journey is this island, whose foul-smelling women murder their husbands when they seek out more fragrant lovers from Thrace. Hephaestus lands on this island when he is thrown off of Olympus.

ANSWER: **Lemnos** [or **Limnos**] <Kim>

15. This character's attempts to see banishment as a form of mercy provoke the replies "Ha, banishment! Be merciful, say 'death'" and "'Tis torture, and not mercy!" For 10 points each:

[10] Name this official. He gives a teenage girl a vial of poison which allows her to fake death, a few days after presiding over a secret forbidden wedding for that girl in his cellar.

ANSWER: Friar **Laurence** [or Friar **Lawrence**; prompt on **Friar**]

[10] Friar Lawrence's cellar is in this Italian city, the setting of Shakespeare's *Romeo and Juliet*. In another Shakespeare comedy, Valentine and Proteus are the title *Two Gentlemen* of this city.

ANSWER: **Verona**

[10] This offensive gesture is performed by Abraham and Balthasar, two Montague supporters, in the first scene of *Romeo and Juliet*, provoking a sword fight with the Capulet retainers Sampson and Gregory.

ANSWER: they **bite** their **thumbs** <Jackson>

16. One of the first of these algorithms was designed in the 1960s by John McCarthy and is known as the mark and sweep method. For 10 points each:

[10] Identify these types of algorithms that don't require programmers to explicitly free allocated memory. An approach to doing this finds all non-reachable memory and deletes it.

ANSWER: **garbage collection** algorithms [or word forms]

[10] This object-oriented language used in many AP CS classes includes a garbage collector. Dalvik runs programs written in this language on Android devices.

ANSWER: **Java** [do not accept "Javascript"]

[10] McCarthy's garbage collector was written for Lisp, which is an example of this type of language. Haskell is an example of the "pure" form of this type of language, as its namesake constructs do not cause side effects.

ANSWER: **functional** programming language <Bentley>

17. Name some things about the Four Noble Truths of Buddhism, for 10 points each.

[10] The First and Second Noble Truths state that all life is characterized by *dukkha*, or this unpleasant state of being or unease caused by unrealistic desires like permanent happiness and immortality.

ANSWER: **suffering** [or **anxiety**; or **stress**; or **angst**]

[10] The Third Noble Truth, *nirodha sacca*, is about this aspect of suffering.

ANSWER: the **end** of suffering [or the **cessation** of suffering, or synonyms]

[10] The Fourth Noble Truth states that following the Eightfold Path can lead to nirvana, which releases one from this endless cycle of birth, suffering, death, and reincarnation.

ANSWER: **samsara** [or **khora**] <Spencer>

18. This composer, Pierre Boulez, and Bruno Maderna conducted the first performance of his *Gruppen* for three orchestras. For 10 points each:

[10] Name this composer who dedicated some of his *Klavierstücke* to David Tudor and incorporated others into his opera cycle *Licht*.

ANSWER: Karlheinz **Stockhausen**

[10] Tudor was also the dedicatee of this composer's silent piece *4'33"* and his *Music for Changes*, which was based on the *I Ching*.

ANSWER: John **Cage** [or John Milton **Cage**, Jr.]

[10] Cage wrote a series of *Sonatas and Interludes* for this modified instrument, which uses objects like screws, bolts, and pieces of rubber to alter the timbre.

ANSWER: **prepared piano** [prompt on **piano**] <Kothari>

19. This character crashes a dinner party after a debate in which Mrs. Smith steadfastly claims, "Experience teaches us when a doorbell is ringing it is because there is never anyone there." For 10 points each:

[10] Identify this character who tells a series of nonsensical parables, including an experimental fable about a dog who tells a cow that it hasn't swallowed his trunk yet because it thought it was an elephant.

ANSWER: The **Fire Chief**

[10] The Fire Chief, like the Smiths and the Martins, is a character from *The Bald Soprano*, the first play by this Romanian-French absurdist playwright. Bérenger appears in many of his plays, including *Rhinoceros*.

ANSWER: Eugène **Ionesco** [or Eugen **Ionescu**]

[10] This other Ionesco play is on a permanent double-bill with *The Bald Soprano* at Paris's Theatre de la Huchette. After a torrent of non-sequiturs, it ends with the Professor stabbing and killing the Pupil.

ANSWER: *The* **Lesson** [or *La* **Leçon**] <Cheng>

20. When the melody of this aria is introduced, the last bar is conspicuously silent. For 10 points each:

[10] Name this aria in which the Duke of Mantua compares the title figure to a feather in the wind.

ANSWER: "La **Donna è mobile**" [or "**Woman is flighty**" or "**Woman is fickle**"]

[10] "La Donna è mobile" appears in the opera *Rigoletto* by this composer, who also wrote *Aida* and *Falstaff*.

ANSWER: Giuseppe **Verdi**

[10] Rigoletto pays this assassin to murder his master the Duke, but he instead kills Gilda after the latter agrees to take the Duke's place.

ANSWER: **Sparafucile** <Rosenberg>

21. Lawbreakers at these events were often hauled before piepowder courts. For 10 points each:

[10] Name these events in the Middle Ages, usually larger in scale than markets, where merchants displayed and sold goods from around the world. A traditional English ballad celebrates an exceptionally-long 45-day one annually held at Scarborough.

ANSWER: chartered **fairs** [accept any answer that includes the word **fair**]

[10] The vendors at the fair in Stourbridge, England specialized in selling this raw material, which was usually shipped across the English Channel to markets in Flanders.

ANSWER: **wool** [prompt on **textiles**]

[10] The Stourbridge fair was intended to raise money for a chapel named for this sort of person. Baldwin IV of Jerusalem was one of these people.

ANSWER: **lepers** [or people with **leprosy**] <Bentley>

22. This author opted not to copyright his book-length attack on American journalism, *The Brass Check*, in order to increase its readership. For 10 points each:

[10] Name this American author. His memoir *I, Candidate for Governor: And How I Got Licked* was the origin of his famous line "It is difficult to get a man to understand something, when his salary depends upon his not understanding it."

ANSWER: Upton **Sinclair** [or Upton Beall **Sinclair, Jr.**]

[10] Sinclair's most enduring work is this novel about the family of Jurgis Rudkus, a Lithuanian immigrant who works in the Chicago meatpacking industry.

ANSWER: *The **Jungle***

[10] Sinclair based the corrupt minister Eli Watkins, a character from this novel, on his longtime foil Aimee Semple Macpherson. This exclamation point-heavy novel focuses on James Arnold "Bunny" Ross, Jr., the son of a self-made tycoon.

ANSWER: **Oil!** <Carson>

23. Answer the following about thin films, for 10 points each.

[10] Light incident on a thin film will either be transmitted or undergo this process at the interface. The angle of incidence equals the angle of this phenomenon.

ANSWER: **reflection** [or word forms]

[10] In anti-reflection coatings, the transmitted light eventually undergoes this process with the reflected light. For this process to occur, the phase difference for two waves must be exactly pi, and the path difference is a half-integer multiple of wavelength.

ANSWER: **destructive interference** [prompt on partial answers]

[10] The amount of light reflected versus transmitted can be obtained from this equation for s-polarized light, which gives the reflectance as a function of the two indices of refraction and the angles of transmission and reflection.

ANSWER: **Fresnel (FRUH-nel)** equations <Silverman>