

## 2015 Virginia Tech Academic Competition Occasion (VTACO)

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### Packet 2: Tossups

1. The Sagnac effect was discovered in an experiment that built upon the results of this experiment. This experiment was replicated with a self-orienting capacitor by Trouton and Noble, and Fitzgerald and Lorentz proposed an explanation for this experiment's results. The Kennedy-Thorndike experiment shortened a device crucial to this experiment. That device split a beam of light in two and then reunited the two halves, and it is known as an interferometer. For 10 points, name this doubly-eponymous experiment conducted at Case Western that disproved the existence of luminiferous aether and led to the current value of the speed of light.

ANSWER: Michelson-Morley Experiment [accept in either order; prompt on partial answer]

2. This man's "night music" style is exemplified in the timpani glissandi in his *Music for Strings, Percussion, and Celesta*. The title character is robbed and stabbed in this man's ballet *The Miraculous Mandarin*. This man included sections like "Elegia," "Game of Pairs," and "Interrupted Intermezzo," in a work that also parodies Shostakovich's "Leningrad" Symphony, his *Concerto for Orchestra*. In one of this man's operas, the title character's former wives are seen by Judith after she opens the seventh door of the title institution. For 10 points, name this Hungarian composer of *Duke Bluebeard's Castle*.

ANSWER: Bela Bartok

3. As Home Secretary, this man lost popularity after sending troops to quell the Tonypandy Riots, and this man created the Special Operations Executive headed by Hugh Dalton. Herbert Asquith named this man the First Lord of the Admiralty, but he was forced to resign from that post after the failed Gallipoli Campaign. This leader returned Britain to the gold standard as Chancellor of the Exchequer, and he met with Josef Stalin and Franklin Roosevelt at Yalta before losing an election to Clement Attlee. For 10 points, name this Prime Minister who gave a speech claiming that "This was their finest hour," Britain's leader during World War II.

ANSWER: Winston Churchill

4. The geographic center of this state is located in Hernando County, which is located next to the Homosassa Bay. The highest point in this state is Britton Hill, which is the lowest high point of any state. At this state's city of White Springs, the Alapaha and Withlacoochee rivers flow into the Suwannee River. Containing the Big Cypress Swamp and Lake Okeechobee, this state is also home to the oldest permanent European settlement in the United States, St. Augustine. Tourist destinations in this state include the Everglades and Disney World. For 10 points, name this "Sunshine State" with capital at Tallahassee.

ANSWER: Florida

5. One character in this novel has a dream in which peasants beat an old mare to death, and that character is cared for by the doctor Zosimov. Another character in this novel attempts to frame the daughter of the drunkard Marmeladov by placing a one-hundred ruble note in her pocket. In this novel, Dunya ends her engagement to Luzhin and marries Razumikhin, prompting Svidrigailov to commit suicide. In this novel, the prostitute Sonya encourages the protagonist to confess to Porfiry Petrovich about his murder of Lizaveta and the pawn-broker Alyona Ivanova. For 10 points, name this novel about Raskolnikov by Fyodor Dostoyevsky.

ANSWER: **Crime and Punishment** [or **Prestupleniye i nakazaniye**]

6. Book two of this work, which discusses stock, notes that “Brutus lent money in Cyprus at eight-and-forty per cent.” Book four of this work, “Of Systems of Political Economy,” uses a comparison of French and Portuguese wine to argue against protectionist tariffs, and it also argues against mercantilism. The first book of this work uses the example of a pin factory to illustrate the division of labor. This work claims that individuals acting in self-interest will benefit the market, a concept known as the “invisible hand.” For 10 points, name this work advocating laissez-faire policies written by Adam Smith.

ANSWER: *An Inquiry into the Nature and Causes of the* **Wealth of Nations**

7. A ritual dance in this religion is the *kagura*, and wooden plaques engraved with wishes and desires placed at this religion's shrines are known as *ema*. This religion venerates Jimmu, and its creation myth depicts the so-called “leech-child.” The origins of this religion can be traced to the Koshiki, and the gates to this religion's shrines are called *torii*. This religion's sea god, Susanoo, is also the ruler of its underworld, Yomi. Other deities in this religion include Izanagi and Izanami, who created its native island, and this religion's sun goddess is Amaterasu. For 10 points, name this religion that venerates kami, the native religion of Japan.

ANSWER: **Shintoism**

8. The “checkerboard” variety of this process is used before ELISA, and its Mohr variety uses silver nitrate. The Karl Fischer variant of this technique uses sulfur dioxide to determine trace amounts of water in a sample. Another variant of this technique may use the chelating (“KEE-late-ing”) agent EDTA and is called the complexometric form. Plots of this process display at least one inflection point at the equivalence point, and its acid-base variety may use an indicator like phenolphthalein. For 10 points, name this lab technique that can use a buret to determine the concentration of a substance.

ANSWER: **Titration**

9. In this novel, hatred for Linda is heightened after she partakes in *mescal* and sleeps with Popé. The protagonist of this novel pursues a relationship with Lenina Crowne, and this novel sees Helmholtz exiled to the Falkland Islands by Mustapha Mond. In this novel, supplies of contraceptives are contained within Malthusian belts, and Podsnap's Technique improves the efficiency of the Bokanovsky Process. This novel details *soma*-induced orgies, and John the Savage hangs himself at its conclusion. For 10 points, name this dystopian novel taking place in the year 632 After Ford, a work of Aldous Huxley.

ANSWER: **Brave New World**

10. This deity made a trumpet by ordering worms to hollow it out and bees to buzz inside of it. After this deity slept with his celibate priestess sister, he threw himself on a funeral pyre in shame, after which his heart became the planet Venus. He mixed the bones from the previous four worlds with his own blood to create humanity. This god was once exiled by his rival, the "smoking mirror" Tezcatlipoca. Because this god had light skin and a light beard, his followers made the grave mistake of confusing this feathered serpent with Hernan Cortes. For 10 points, name this principal deity of Aztec mythology.

ANSWER: Quetzalcoatl

11. This man argued in defense of two brothers convicted for selling lottery tickets in *Cohens v. Virginia*. This man controversially supported the Fugitive Slave Act in his "Seventh of March" speech, and this man defended his alma mater in the Supreme Court case *Dartmouth v. Woodward*. This man debated with South Carolina's Robert Hayne over the issue of nullification. While serving as Secretary of State under William Harrison and John Tyler, this statesman signed a treaty establishing the border between Maine and Canada. For 10 points, name this orator from New Hampshire who negotiated a treaty with Baron Ashburton.

ANSWER: Daniel Webster

12. It's not Crohn's disease, but mutations resulting in variants of the enzyme dardarin can increase the risk of this disease. The LOUD treatment is designed to help patients with this disease. This disease can be treated by MAO-B inhibitors, and the Hoehn and Yahr scale measures its spread. The accumulation of alpha-synuclein results in the formation of Lewy bodies, the aggregation of which characterizes this disease. This disease sees the degradation of the substantia nigra, and it is most commonly treated with L-Dopa. For 10 points, name this disease that impairs motor skills, whose research has been funded by Michael J. Fox.

ANSWER: Parkinson's Disease

13. In one work by this man, Neil learns that he is of African-American descent, and another of his novels sees the U.S. overtaken by the dictator Buzz Windrip. In addition to writing *Kingsblood Royal* and *It Can't Happen Here*, this man wrote a work that concludes with the title character praying while checking out a choir girl's legs. In addition to writing *Elmer Gantry*, another of this author's title characters owns a real estate firm in Zenith with his friend Paul Riesling. This man's most famous work sees Will Kennicott's wife Carol Milford return to Gopher Prairie. For 10 points, name this author of *Babbitt* and *Main Street*.

ANSWER: Sinclair Lewis [do not accept or prompt on "Sinclair"]

14. Cecile Renault attempted to assassinate this man, and this man established the journal *The Defender of the Constitution*. This man became the leader of the Mountain Faction of the National Convention in 1792, and he assumed complete power after defeating the Indulgents. This man denounced the practitioners of the Religion of Reason, the Hebertists, and instead attempted to establish a religion of the Supreme Being. This rival of Danton was ousted and killed in the Thermidorian Reaction, and he was dubbed "the incorruptible." For 10 points, name this cruel French leader whose short tenure as head of the Committee of Public Safety saw the Reign of Terror.

ANSWER: Maximilien Robespierre

15. One scale for measuring these events was developed by Thomas C. Hanks and Hiroo Kanamori, and these events are classified by location into Flinn-Engdahl regions. They cannot be detected in shadow zones, and deep-focus variants of these events commonly occur in Wadati-Benioff zones. These events see the propagation of S and P waves, and the hypocenter lies beneath the epicenter of these events. The local intensity of these events can be measured using the Mercalli scale. For 10 points, name these events most commonly measured on the Richter scale during which the ground shakes.

ANSWER: Earthquakes

16. The 2008 iteration of this team finished 4-8 after quarterback Jerrod Johnson was forced to replace the injured Stephen McGee. The 2011 edition of this college football team defeated Northwestern in the Meineke Car Care Bowl under the leadership of Ryan Tannehill. The 2014 version of this college football team saw coach Kevin Sumlin give quarterback Kyle Allen the starting nod over Kenny Hill. The 2012 edition of this team featured tackles Luke Joeckel and Jake Matthews as well as wide receiver Mike Evans. For 10 points, name this university whose 2012 team also featured Heisman Trophy winner Johnny Manziel.

ANSWER: Texas A&M Aggies [do not accept or prompt on "Texas" or "Texas Tech"]

17. A monstrous figure hulks over the title character of this painting in a version of it by Picasso. Another version of it sees a top hat and bowl of fruit sitting on a pink table next to a standing nude woman. In addition to that version by Edvard Munch, the words "Given that I am unhappy, I have a right to your help" appear on a note in the most famous painting of this name. This painting also sees a knife laying on the floor and an inkblot resting atop a wooden block. This painting depicts the aftermath of an act perpetrated by Charlotte Corday. For 10 points, name this painting depicting the murder of a French revolutionary lying in a tub, a work of Jacques-Louis David.

ANSWER: The Death of Marat

18. One character in this work receives a letter from his mother insisting that he marry Micaëla. Upon being detained, another character in this work sings a seductive *seguidilla* to get that character to free her. The latter character later sings the "Flower Song" to the former. After entering Lillas Pastia's Inn in this opera, a third character introduces himself in the "Toreador Song." This opera's first act sees its title character sing that "Love is a rebellious bird that none can tame" in the chromatically-descending "Habanera." For 10 points, name this opera centering on the love triangle among Jose, Escamillo, and the title gypsy, an important work of Georges Bizet.

ANSWER: Carmen

19. This man's general Jebe was known as the "Arrow" and achieved victory at the Battle of the Kalka River, and this leader established the secret Yassa law code. This man defeated the Kara-Khitans, and he also led conquests against the Western Xia and Jin dynasties. This ruler sacked Samarkand as part of his conquest against the Khwarezmian Empire, a campaign led by his general Subutai. This man, who was born Temujin, snubbed his oldest son Jochi when he chose the younger Ögedei as his successor, and he established a capital at Karakorum. For 10 points, name this man who unified the Mongols, the grandfather of Kublai.

ANSWER: Genghis Khan [or Chinghis Khan; accept Temujin before mentioned]

20. One poet who wrote in this language implores "Do not cast thy glance upon my golden face, for I have iron legs" regarding his impending death. In addition to being the language of the *Spiritual Couplets*, an epic in this language details Rostam's accidental killing of his son Sohrab. A poem written in this language asserts "The Moving Finger writes, and, having writ, / moves on" and describes "A Jug of Wine, a Loaf of Bread, and Thou." This language was used to write the *Shahnameh* and a poem notably translated by Edward FitzGerald. For 10 points, name this language of the poets Rumi and Ferdowsi, the language in which Omar Khayyam wrote his *Rubáiyát*.

ANSWER: **Persian** Language [or **Farsi**; or **Parsi**; prompt on "Iranian"]

TB. This poem's speaker instructs its addressee to roll their "sweetness up into one ball." The speaker of this poem laments that "The grave's a fine and private place/But none, I think, do there embrace." The speaker of this poem also envisions his love being denied "Till the conversion of the Jews." This poem describes a love "ten years before the flood" that will expand "Vaster than empires, and more slow." This poem's speaker constantly hears "Time's winged chariot hurrying near." This poem opens with the line "Had we but world enough, and time." For 10 points, name this carpe diem poem by Andrew Marvell.

ANSWER: **"To His Coy Mistress"**

## Packet 2: Bonuses

1. This battle saw the use of Portuguese arquebuses, and one side of this battle consisted of forces loyal to Toyotomi Hideyori. For 10 points each:

[10] Name this battle that saw the forces of Ishida Mitsunari and Mori Terumoto defeated by those of Tokugawa Ieyasu, thereby establishing his namesake shogunate.

ANSWER: Battle of Sekigahara

[10] This period of modernization from 1868 to 1921 ended the Tokugawa shogunate under the watch of its namesake Emperor. Its goals were outlined in the Charter Oath.

ANSWER: Meiji Restoration [accept equivalents]

[10] This American Commodore had earlier played a key role in establishing the Open Door Policy with Japan by signing the Treaty of Kanagawa with the Tokugawa shogunate.

ANSWER: Matthew Calbraith Perry

2. Answer the following about German composers, for 10 points each.

[10] This German pioneered contrapuntal technique and composed important works like *The Well-Tempered Clavier*, the *Brandenburg Concertos*, the *Goldberg Variations* and a *Tocatta and Fugue in D Minor*.

ANSWER: Johann Sebastian Bach [prompt on partial; Do NOT accept "Carl Philipp Emanuel Bach" or "Johann Christian Bach"]

[10] This German, the husband of Clara Wieck, is perhaps best-known for composing the "Spring" and "Rhenish" symphonies.

ANSWER: Robert Schumann

[10] This other German is known for the song cycle *Das Marienleben* as well as an opera about Matthias Grünewald's creation of the *Isenheim Altarpiece*, *Mathis der Maler*.

ANSWER: Paul Hindemith

3. Answer the following about namesakes of elements in the bottom row of the periodic table, for 10 points each.

[10] Element 104 is named after Ernest Rutherford, who devised this experiment conducted by Geiger and Marsden. It involved firing alpha particles at its namesake metal and demonstrated the existence of the atomic nucleus.

ANSWER: Gold Foil Experiment

[10] Element 111 is named for Wilhelm Röntgen, who notably discovered this part of the electromagnetic spectrum with wavelengths just shorter than ultraviolet light.

ANSWER: X-Rays

[10] Element 106 is named after this Berkeley chemist, who was directly involved in the discovery of ten transuranium elements, for which he was awarded the 1951 Nobel Prize in Chemistry alongside Edwin McMillan.

ANSWER: Glenn Theodore Seaborg

4. Ajax the Greater and Odysseus had a speech contest for this man's armor. For 10 points each:

[10] Name this father of Neoptolemus who, despite being dipped in the river Styx by his mother Thetis, died after he was struck in the heel by the arrow of Paris.

ANSWER: **Achilles**

[10] Achilles returned to the Trojan War after his friend Patroclus was slain by this man. In turn, Achilles killed this man and dragged his body around Troy.

ANSWER: **Hector**

[10] Achilles also killed this king of Ethiopia after he slew Achilles' friend Antilochus. However, upon seeing the tears of this man's father Eos, Zeus granted him immortality.

ANSWER: **Memnon**

5. He was pardoned by Gerald Ford. For 10 points each:

[10] Name this Republican president whose administration was the subject of the Saturday Night Massacre and who resigned in the wake of the Watergate scandal.

ANSWER: Richard Milhous **Nixon**

[10] This man served as Nixon's first vice president. He resigned amid charges of tax evasion and was disbarred in Maryland, which claimed he was "morally obtuse."

ANSWER: Spiro **Agnew**

[10] Earlier in his career, Nixon gave this speech when he was accused of improprieties related to his campaign funding. It was named after his dog.

ANSWER: **Checkers** Speech

6. Name these Platonic dialogues, for 10 points each.

[10] This dialogue discusses the Ring of Gyges as well as containing the Allegory of the Cave. It advocates for a Kallipolis, or a city ruled by philosopher-kings.

ANSWER: *The* **Republic** [or **Politeia**]

[10] This dialogue sees Anytus, Meletus, and Lycon accuse Socrates, whose defense against charges of corrupting the young comprises the bulk of the work.

ANSWER: *The* **Apology** [or **Apologia Socratis**]

[10] This dialogue, set at the house of Callias, sees Socrates debate with the title Sophist regarding the teachability of virtue.

ANSWER: **Protagoras**

7. The Iguazu falls lie on this country's border with its northern neighbor. For 10 points each:

[10] Name this country whose other notable geographical features include the Pampas region and whose capital is Buenos Aires.

ANSWER: **Argentina** [or **Argentine Republic**; or **República Argentina**]

[10] Argentina is also home to this largest mountain in the Americas. It was first ascended via the Horcones Valley route, and its name is Quechua for "Sentinel of Stone."

ANSWER: Mount **Aconcagua**

[10] Argentina also is home to this somewhat misnamed estuary at the convergence of the Parana and Uruguay rivers.

ANSWER: **Rio de la Plata** [accept **River Plate** or La **Plata River**]

8. This novel's main character is kidnapped by the Tralfamadorians. For 10 points each:

[10] Name this Kurt Vonnegut novel that sees Roland Weary die of gangrene and Billy Pilgrim witness the firebombing of Dresden.

ANSWER: **Slaughterhouse Five**, or *The Children's Crusade: A Duty-Dance with Death*

[10] This main character of Vonnegut's *Breakfast of Champions* follows Billy Pilgrim in *Slaughterhouse Five*. Philip Jose Farmer wrote his novel *Venus on the Half-Shell* pseudonymously as this character.

ANSWER: **Kilgore Trout** [accept either underlined name]

[10] This porn star in *Slaughterhouse Five* is imprisoned with Billy Pilgrim during his time on Tralfamadore. She and Billy ultimately have sex and conceive a child.

ANSWER: **Montana Wildhack** [accept either underlined name]

9. Answer the following about equestrian statues, for 10 points each.

[10] This Renaissance Florentine depicted the condottiero Erasmo da Narni in his *Equestrian statue of Gattamelata*. However, he is perhaps better known for a bronze *David* that stands on the head of Goliath.

ANSWER: **Donatello** [or Donato di Niccolò di Betto **Bardi**]

[10] This equestrian sculpture of Peter the Great in Saint Petersburg was commissioned by Catherine the Great and sculpted by Étienne Maurice Falconet. It derives its name from a Pushkin poem.

ANSWER: The **Bronze Horseman**

[10] Upon the return of the Rough Riders to the United States, they presented Teddy Roosevelt with this sculptor's bronze statuette *The Bronco Buster*.

ANSWER: Frederic **Remington**

10. It was the subject of the Better Together campaign. For 10 points each:

[10] Name this polity that elected not to leave the United Kingdom in its 2014 independence referendum.

ANSWER: **Scotland**

[10] This current British Prime Minister claimed to be "delighted" upon hearing that Scotland had voted to remain with the United Kingdom.

ANSWER: David **Cameron**

[10] Following the results of the referendum, this Scottish First Minister and head of the Scottish National Party resigned. He was replaced by Nicola Sturgeon.

ANSWER: Alex **Salmond**

11. It attempted to pin the murder of Sir Edmund Godfrey on English Catholics. For 10 points each:

[10] First, name this fictional conspiracy created by Titus Oates whose goal was to drum up anti-Catholic sentiment following the 1672 Royal Declaration of Indulgence.

ANSWER: **Popish** Plot

[10] This actual target of the Rye House Plot was the supposed target of the Popish Plot. Although he was exiled following his defeat at the Battle of Worcester by Oliver Cromwell, he became king again following Cromwell's death.

ANSWER: **Charles II**

[10] The Popish Plot resulted in Parliament passing the second act of this name, which required its members to give an oath rejecting Catholic beliefs like transubstantiation, invocation of saints, and the sacrament of Mass.

ANSWER: **Test** Acts



12. This novel's title character battles the Knight of the White Moon on the beach in Barcelona. For 10 points each:  
[10] Name this novel whose title character loves Dulcinea, hangs out with Sancho Panza, and tilts at some windmills because he thinks they're giants.

ANSWER: *The Ingenious Gentleman Don Quixote of La Mancha* [or *El ingenioso hidalgo don Quijote de la Mancha*]

[10] This Spanish author, who wrote about Elicio and Erastro in *La Galatea* and published a series of twelve novellas as *The Exemplary Novels*, wrote *Don Quixote*.

ANSWER: Miguel de Cervantes Saavedra

[10] This is Don Quixote's horse. After attempting to mate with some ponies, he is hit with clubs by their Galician owners.

ANSWER: Rocinante

13. The time-independent variety of an equation named for this man sets a wavefunction times its energy equal to the Hamiltonian of that wavefunction. For 10 points each:

[10] Name this Austrian physicist who also names a thought experiment that involves determining whether a cat in a box is dead or alive.

ANSWER: Erwin Schrodinger

[10] Schrodinger's cat was formulated to illustrate the problem with this interpretation of quantum mechanics formulated by Bohr and Heisenberg. This interpretation would imply the cat is simultaneously dead and alive.

ANSWER: Copenhagen Interpretation

[10] Another piece of evidence against the Copenhagen interpretation is the EPR Paradox, which essentially outlines this phenomenon in which groups of particles interact in such a way that their quantum states cannot be described independently.

ANSWER: Quantum Entanglement

14. It depicts a bull standing over a woman grieving over her dead child on its left side, and a horse falls in agony after being hit by a spear in its center. For 10 points each:

[10] Name this painting that depicts the bombing of a Basque town during the Spanish Civil War.

ANSWER: Guernica

[10] *Guernica* was painted by this cubist behind *The Weeping Woman* whose "blue period" produced works like *The Old Guitarist*.

ANSWER: Pablo Ruiz y Picasso

[10] Two of the title figures of this Picasso painting are depicted with faces that resemble African masks. It depicts five nude prostitutes standing on a street in Barcelona.

ANSWER: *Les Demoiselles d'Avignon* [or *The Young Ladies of Avignon*; or *The Brothel of Avignon*]

15. The title object of this poem is "glazed with rain water" and "beside the white chickens." For 10 points each:

[10] Name this imagist poem that conveys how "so much depends / upon" the title object.

ANSWER: "The Red Wheelbarrow"

[10] This poet behind the collections *Paterson* and *Pictures from Brueghel* wrote "The Red Wheelbarrow."

ANSWER: William Carlos Williams

[10] The speaker of this Williams poem asks for forgiveness after eating "the plums / that were in / the icebox," claiming that "they were delicious / so sweet / and so cold."

ANSWER: "This is Just to Say"

16. This city-state's decline began following its defeat at the Battle of Leuctra. For 10 points each:

[10] Name this militant Greek city state whose serfs were known as Helots. It defeated Athens during the Peloponnesian War.

ANSWER: Sparta [accept **THIS IS SPARTA!!!**; accept Lacedaemon; curiously accept **THIS IS LACEDAEMON!!!**]

[10] This final battle of the Peloponnesian War saw a Spartan fleet commanded by Lysander crush the Athenian navy.

ANSWER: Battle of Aegospotami

[10] This Athenian historian's *History of the Peloponnesian War* serves as more of a mythos than an actual history, but it does contain Pericles' Funeral Oration.

ANSWER: Thucydides

17. The trace of these constructs can be found by adding all of the elements in the main diagonal, and the determinant of one variety of them is equal to  $a_d - b_c$ . For 10 points each:

[10] Name these constructs that can be used to solve systems of equations.

ANSWER: Matrices [or Matrix]

[10] These values for matrices, also called the characteristic value, are equal to the matrix times a similarly-named vector when multiplied by that same vector. They are the roots of the characteristic polynomial.

ANSWER: Eigenvalues [do not accept "Eigenvectors"]

[10] These square matrices consist of all second-order partial derivatives of a scalar-valued function. Calculating the determinant of these matrices can be used to find the local extrema of a multivariable function.

ANSWER: Hessian Matrix

18. Name some soccer teams from the 2014 World Cup, for 10 points each.

[10] This team became the earliest defending champion to be eliminated from the World Cup after losing to the Netherlands and Chile. They won in 2010 against the Netherlands off an overtime goal from Andres Iniesta.

ANSWER: Spain [or España, prompt on "La Furia Roja"]

[10] This team's coach Jurgen Klinsmann faced minor backlash when he cut star Landon Donovan from the final roster. Its goalkeeper Tim Howard set the World Cup record with 18 saves in a loss to Belgium.

ANSWER: United States of America [or Team USA]

[10] This team entered the World Cup without star striker Falcao, who hadn't recovered from a knee injury.

Breakout star James ("HAH-mez") Rodriguez won the Golden Boot with this team as the Cup's leading goalscorer.

ANSWER: Republic of Colombia

19. Two characters in this work see a performance of *The Murder of Gonzago*. For 10 points each:

[10] Name this play whose opening scene sees a flipped coin come up heads 92 consecutive times. It centers on two minor characters from *Hamlet*.

ANSWER: Rosencrantz and Guildenstern are Dead

[10] This absurdist playwright of *The Coast of Utopia* and *The Real Inspector Hound* wrote *Rosencrantz and Guildenstern are Dead*.

ANSWER: Tom Stoppard

[10] This play by Stoppard sees Hannah Jarvis and Bernard Nightingale investigate mysteries surrounding Lord Byron, but instead learn truths about Thomasina Coverly, who is the pupil of Septimus Hodge.

ANSWER: Arcadia

20. This species was the first multicellular species to have its whole genome sequenced. For 10 points each:

[10] Name this species of predominantly hermaphroditic nematodes whose study as a model organism was first promulgated by Sydney Brenner.

ANSWER: **C. Elegans** [or **Caenorhabditis elegans**]

[10] This species was the model organism in which the Sonic hedgehog homolog was first discovered. These insects were also the subject of Thomas Hunt Morgan's study on sex-linked characteristics.

ANSWER: **Drosophila Melanogaster** [or **D. Melanogaster**; or **fruit fly**]

[10] Drosophila studies have also given insight into the function of these genes, which control the body plan of an embryo along the anterior-posterior axis. They determine what structure will form along a particular body segment.

ANSWER: **Hox** Genes [or **Homeotic** genes]

TB. It can be seen in the sums of the shallow diagonals of Pascal's triangle, and it is a complementary pair of Lucas sequences. For 10 points each:

[10] Name this sequence of numbers whose elements are the sum of the previous two numbers. It begins one, one, two, three, five, eight.

ANSWER: **Fibonacci** sequence [or **Fibonacci** numbers]

[10] As they approach infinity, the nth Fibonacci number divided by the previous one approaches this number. Its value is defined as one plus the square root of five, all over two.

ANSWER: **Golden Ratio**

[10] The Fibonacci numbers are an example of this type of sequence, meaning that every positive integer can be written as a sum of Fibonacci numbers where any one number is used no more than once.

ANSWER: **Complete** Sequence