

STIMPY 2015: we barely wrote the tournament, so there was no time to write a subtitle

Packet by Illinois A and VCU A

Edited by Chris Manners, Jordan Brownstein, Dan Puma, Brian McPeak, Jacob Reed, Sohan Vartak, Grace Liu, Ophir Lifshitz

Tossups

1. **An approximation only applicable to molecules with this property assumes that the overlap integral is zero and turns finding the Hamiltonians into a simple eigenvalue problem. Regions of molecules with this property can be modelled as an infinite potential well with an equal length. For longer versions of these systems, the Fieser–Kuhn rules are used to calculate peak absorption instead of the usual (\*) Woodward–Fieser rules.**

Chromophores contain long regions with this property, and addition reactions to this kind of system may use Gilman reagents to selectively form one of the products. This property is exhibited in 1,3-pentadiene but not in 1,4-pentadiene because the double bonds are isolated. For 10 points, name this property in which alternating single and double bonds cause delocalization of pi electron systems.

ANSWER: conjugation [accept equivalents such as containing a delocalized pi system before mentioned]

2. **Hermann Usener published a massive compilation of works inspired by this philosopher’s school. This man conjectured that the gods occupied an area devoid of atoms called the *metakosmia*. This man founded a philosophical school that ultimately dominated over one established by Aristippus of Cyrene. Another man introduced the concept of *clinamen* in a poem written in the philosophical tradition of this man, who divided one concept in his own philosophy into (\*) “static” and “kinetic” types. Lucretius was an ardent follower of this man, who argued that the perfect life was characterized by freedom from distress and freedom from pain, known as *ataraxia* and *aponia*, respectively. For 10 points, name this Greek philosopher whose namesake school of philosophy holds that pleasure is the ultimate good.**

ANSWER: Epicurus [or Epicureanism]

3. **One side of this war received supplies from an allied country through the dummy companies HISMA and ROWAK. Piracy during this war was addressed at the Nyon Conference, and this war caused the cancellation of the People’s Olympiad. During this war, the Assault Guard clashed with the POUM and the CNT in the May Events. After the outbreak of this war, Alexander Orlov transported a (\*) gold reserve to Moscow. The term “fifth column” was coined by a general in this war who, like his colleague Jose Sanjurjo, died in a plane crash. The Abraham Lincoln Battalion was one of the International Brigades that fought in this war. The Condor Legion assisted one side of this war. For 10 points, name this war which included the bombing of Guernica and was won by the leader of the Falange, Francisco Franco.**

ANSWER: Spanish Civil War

4. **In this play, a woman pretends to be insane by talking about “Egypt-clay-leg” and “Gog-clay-leg.” A character in this play is gagged with a piece of gingerbread and thrown in a privy after being pinched by men posing as elves and robbed during a meeting with the “Queen of Fairy.” In this play, two holy brethren from Amsterdam, Tribulation Wholesome and (\*) Ananias, claim that counterfeiting is lawful. One of its characters disguises himself as a Spaniard to woo Dame Pliant and save Sir Epicure Mammon. Before this play begins, Lovewit flees the city to escape the plague, leading Doll Common and Subtle to set up a con in his house. For 10 points, name this play in which Subtle pretends to be able to create the philosopher’s stone, a work of Ben Jonson.**

ANSWER: *The Alchemist*

5. **Elliott Carter wrote *Eight Pieces* for four of these instruments. In the first movement of Beethoven’s fourth symphony, the leadup to the recapitulation prominently features this instrument. This instrument plays a counter-rhythm to the strings at the beginning of the third movement of Sibelius’s Violin Concerto. This**

**instrument plays the first notes of Sibelius's seventh symphony and Bartók's third piano concerto. (\*)**

Nielsen's fourth features a "duel" of these instruments. Like the harp, this instrument uses pedals for tuning. This instrument has a solo at the beginning of Beethoven's Violin Concerto, Grieg's Piano Concerto and Haydn's 103rd symphony. This instrument plays loud triplets on C and G in response to the trumpet fanfare at the beginning of *Also Sprach Zarathustra*. For 10 points, name this set of three to five tuned drums.

ANSWER: timpani [or kettledrums; prompt on just "drums"]

**6. A member of this dynasty was so good at shooting machine guns he got the nickname "Maxim." One member of this dynasty got rid of his council of advisors known as the "Harvard Group" before embarking on a campaign that would produce the Literary Corps, which he also called the Army of Knowledge. One ruler in this dynasty was supported by William Edmond Ironside and took power after leading the Cossack Brigade. The (\*) Tudeh Party was formed after that founder of this dynasty was forced into exile in Mauritius. A ruler of this dynasty led a program of westernization known as the White Revolution. The founder of this dynasty deposed the Qajar Dynasty, and his son cooperated during Operation Ajax, leading to the overthrow of Prime Minister Mohammed Mossadegh. For 10 points, name this dynasty that included two Rezas, and was overthrown in the Iranian Revolution.**

ANSWER: Pahlavi dynasty

**7. A poem by this author lists "eyes of your failure at piano" and "eyes of the killer Grandma," and addresses a person "without corsets & eyes." This poet wrote "I am obsessed by Time Magazine" in a poem in which he describes being sold garbanzos at a Communist meeting he attended at age seven. One of his poems includes a lengthy footnote that proclaims "the world is holy! the soul is holy!" This poet wrote "Go (\*) fuck yourself with your atom bomb" in one poem and wrote about the death of his mother Naomi in another. A poem by this author discusses Moloch in its second section and repeatedly tells Carl Solomon that "I'm with you in Rockland." For 10 points, name this poet of "Kadesh" and "America" who described seeing "the best minds of my generation destroyed by madness" in "Howl."**

ANSWER: Allen Ginsberg

**8. Two of this figure's sons were killed by a king in front of altars, angering some gods who then caused that king to be killed by his nephew Aurelius Conanus some years later. This man delivers the killing blow to Lamorak, son of King Pellinore. In one account, this figure survived his most well known encounter and instead died of starvation, but not before eating the dead body of Guinevere. All the noble children (\*) born on this figure's birthday were set adrift to sea, but this figure survived a shipwreck and was fostered by Nabur. During Arthur's absence, this man seized the throne as well as Guinevere, prompting Arthur to return and fight him at the Battle of Camlann. For 10 points, name this traitor from Arthurian legend, commonly held to be the incestuous son of Arthur and Morgause.**

ANSWER: Mordred

**9.  $N$ -point correlation functions can be calculated by differentiating this function  $N$  times with respect to the auxiliary function  $J$ . This function of a system of noninteracting particles composed of  $N$  subsystems can be written as the product of these for each subsystem, but if each subsystem is composed of identical particles, that total must be divided by  $N$  factorial to resolve the Gibbs paradox. The free energy for any particular ensemble is proportional to the (\*) natural log of this function for that system. In a canonical ensemble, it is defined as the sum over microstates of the exponential function of quantity negative energy of microstate multiplied by thermodynamic beta. This function normalizes the Boltzmann distribution. For 10 points, identify this function from statistical mechanics that describes the macroscopic properties of a thermodynamic system, which is symbolized  $Z$ .**

ANSWER: partition function [or  $Z$  before mentioned]

10. Photosynthetic organisms called hypoliths are found in large quantities on this territory's Devon and Cornwallis Islands. The medieval Dorset culture flourished in this modern day territory, whose northernmost point lies south of the Lincoln Sea. The Belcher Islands are a part of this territory, whose highest point is Barbeau Peak. The northernmost permanently inhabited place in the world, (\*) Alert, is located on an island in this territory. The cities of Whale Cove and Rankin Inlet are located in this territory, which includes most of the western shore of the Hudson Bay. This territory, which includes Ellesmere Island, has a capital that lies between two peninsulas on Frobisher Bay. For 10 points, name this most recently incorporated and primarily Inuit Canadian territory, whose capital is Iqaluit.

ANSWER: Nunavut

11. One of this city's borders was marked with two pillars where the Philaeni twins were buried alive. This city had an artificial harbor called the cothon and was centered on the Byrsa citadel. Aristotle claimed that boards called pentarchies elected judges to this city's Council of One Hundred and Four. A leader of this city used the Saw canyon to starve out Spendius's mercenaries in the Truceless War. Tophet graveyards suggest that people of this city (\*) sacrificed children on statues of Tanit. Writings from this city include an agricultural manual by Mago and a periplus by Hanno the Navigator. This city won the battles of Lake Trasimene and Cannae in a war which ended with its loss at Zama. For 10 points, name this city once led by Hannibal which fought the three Punic wars with Rome.

ANSWER: Carthage

12. In one scene in this film, several characters, including Alee, emerge from a vessel, and in the beginning of this film, the main character is referred to as "the big aggie." In one famous scene from this film, the main character repeatedly licks his knife and is aided by Nyla and Cunayun in building a structure, which he then (\*) cuts a hole in and sticks his face out of. In another scene in this film, there are frequent cuts to a growling dog, which is then fed after a character catches a seal. With a group, the main character of this film hunts a walrus, and the portrayal of that character famously died of starvation two years after this film premiered. For 10 points, name this film directed by Robert Flaherty, a silent "documentary" about an Inuit man.

ANSWER: Nanook of the North

13. A character in this novel becomes a vegetarian and begins wearing a diaper after travelling as a beggar in India. While searching her house for walking mummies, a woman in this novel discovers nude pictures of servants in her husband's secret photo studio. In this novel, a former patron of the Red Lantern brothel receives three human fingers in the mail, which parallel the three fingers he had once (\*) cut off Pedro Tercero's hand. This novel's first and last sentence is "Barrabas came to us by sea." Near the end of this novel, the prostitute Transito Soto secures the release of the revolutionary Alba. In this novel, the death of her green-haired woman leads the owner of Tres Marias to marry her sister, the clairvoyant Clara del Valle. For 10 points, name this novel about the Trueba family by Isabelle Allende.

ANSWER: *The House of the Spirits* [or *La casa de los espíritus*]

14. Alpha-helices from syntaxin and synaptobrevin open these structures by "zippering." One of these structures is formed when LDL binds to AP2. Botulism and tetanus work by preventing these structures from being opened. A protein found on these structures consists of three light chains and three heavy chains in a triskelion shape. That protein forms soccer ball-shaped (\*) cages around these structures. These structures are opened by SNARE proteins. When going between the Golgi apparatus and the endoplasmic reticulum, they can be coated with COPI or COPII. They form from clathrin-coated pits in endocytosis. Large ones used for storage are called vacuoles. For 10 points, name these bubble-like structures that transport molecules within and between cells.

ANSWER: vesicles

15. This man claimed that he “came out naked in the shipwreck of human life” in the preface to one work. This man burns the face of a devil taunting a man named Peter in this man’s biography written by John the Deacon. This man wrote about how to properly govern monastic communities in a work addressed to Leander of Seville, to whom he also addressed his commentary on the Book of Job, called the *Magna Moralia*. This author of Pastoral Care wrote a letter praising Bertha of (\*) Kent who, with her husband Aethelbert, was converted by this man’s emissary. That man, Augustine, became the first Archbishop of Canterbury while converting many in Britain in a mission funded by this pope. For 10 points, name this sixth century pope whose writings and spreading of the faith earned him the nickname “the great.”

ANSWER: Gregory I [or Gregory the Great; prompt on “Gregory”]

16. In a novel by this author, a character remembers watching sailors cut off the hands of people reaching for lifeboats during the wreck of the *Bourgogne*. That novel by him contains a strange chapter in which a character is led around by an angel whom he then wrestles for an entire night. One of this author’s protagonists jumps into a draining pond to catch eels and enjoys poaching rabbits on his own Normandy estate. He created a character who gets a job as a secretary after using a dropped checkroom ticket to steal another man’s bag. That novel by this author ends with Boris (\*) shooting himself in a classroom during a botched initiation rite. In one of his novels, the protagonist watches Moktir steal a pair of scissors from his wife Marceline and develops an interest in Arab boys while recovering from tuberculosis. For 10 points, name this French author of *The Counterfeiters* and *The Immoralist*.

ANSWER: André Gide

17. The facade of a building in this painting depicts two lions holding up a crown. In the left of this painting, a mob of people in black wielding shovels and swords congregate under two red flags. The artist of this painting painted over the phrase “ich bin Jude” and a swastika on the armband of a soldier for the final version of this painting. At the bottom of this painting, a mother huddles up with her child next to a partially-lit (\*) menorah, which sits at the feet of this painting’s subject. A Lithuanian flag appears above a burning synagogue in this painting, which also features a ladder protruding from the ground next to its subject, who is brightened by a ray of light. For 10 points, name this Marc Chagall painting which depicts Jesus on the cross.

ANSWER: White Crucifixion

18. In one article, this man wrote that the title concept is a “spiritual fact” and imagined a scheme of life within which labor is “substantially ignoble.” A section of a book by this man decries a certain practice as “a hindrance to the highest industrial efficiency” of communities and asserts that the title phenomenon arises as a result of man’s predatory nature. This man argued that a “close knit body of theory” was central to a Darwinian perspective of science, and that (\*) economics doesn’t meet that criteria in “Why Economics is Not an Evolutionary Science.” This man included the section “The Belief in Luck” in a book where he used the example of a Polynesian chief and the King of France to demonstrate his concept of the non-productive consumption of time. For 10 points, name this economist who wrote about “conspicuous consumption” in *Theory of the Leisure Class*.

ANSWER: Thorstein Bunde Veblen

19. COMPTEL produces maps of the aluminum-26 emission line produced in these events. The repeated cracking of magnetar crusts is responsible for these events in a model of their production. One of these events named 970508 was thought to be a variable star, but accurate optical observations of over three days showed a persistent X-ray signal which disproved that theory. That observation also placed the origin of these objects outside of the Milky Way, and was made by (\*) BeppoSAX, which looked at the electromagnetic spectrum of their afterglow. These events may occur repeatedly from SGRs. These objects were originally discovered by the Vela satellites looking for radiation from Soviet nuclear tests. For 10 points, identify these astronomical explosions that release their namesake form of electromagnetic radiation more energetic than X-rays.

ANSWER: gamma-ray bursts [or GRBs]

20. This policy is satirized as the “Connecticut Plan” in a cartoon in which a man in a washtub suggests “get Morgan to buy her.” The issuance of Erlanger bonds made violations of this policy more profitable. This policy was organized in accordance with the fourth point of the Declaration of Paris. The Du Pont Board oversaw this policy, which partly caused the Lancashire famine. To help undermine this policy, the Laird brothers built two “rams,” and this policy was declared constitutional in the (\*) Prize Cases. As part of this policy, old whaling ships were sunk to form the Stone Fleet. Charles Wilkes captured James Mason and John Slidell while they were violating this policy, sparking the Trent Affair. For 10 points, name this part of the Anaconda Plan, a Union policy intended to stop the South from trading during the Civil War.

ANSWER: the Union **blockade** of the Confederacy [prompt with “what part of the plan?” on “the Anaconda Plan” before “Anaconda” is read; prompt on descriptive answers]

## Bonuses

1. This system's Hamiltonian contains terms for the kinetic energies of its two electrons, two terms for the attraction between the electrons and the nucleus, and one term for electron-electron repulsion, and generally sucks ass because it's a three-body problem. For 10 points each:

[10] Name this system whose electron-electron repulsion term makes its Hamiltonian non-separable and a general bitch to solve. Unlike the simpler hydrogen atom system, an exact wavefunction for this system has not been found.

ANSWER: helium atom

[10] The lowest possible energy to obtain this configuration in helium is when one electron is in the 1s ("one-s") orbital and the other is in the 2s ("two-s") orbital. This configuration has a total spin of one, and a forbidden transition from it to a ground state is typically what causes phosphorescence.

ANSWER: triplet state [or orthohelium]

[10] An upper bound on the ground state of the helium atom can be found using this principle. It involves creating a trial wavefunction dependent on some parameter lambda, then finding the value for lambda that minimizes the energy.

ANSWER: variational method [or variational principle]

2. [This man addressed the problem of evil by claiming that God does not will evil, but that it is an unintended consequence of God's creation. For 10 points each:

[10] Name this French philosopher who authored the two-volume work *The Search After Truth*.

ANSWER: Nicolas Malebranche

[10] Malebranche was a champion of this belief, which holds that God is the direct source of all events. Al-Ghazali argued for this position in *The Incoherence of the Philosophers*.

ANSWER: Occasionalism

[10] This philosopher and leader of the Port-Royal group of Jansenists engaged in a long philosophical feud with Malebranche.

ANSWER: Antoine Arnauld

3. This system was adapted to write the Hittite language. For 10 points each:

[10] Name this early wedge-shaped writing system developed in Sumer and used for Akkadian, Assyrian, and Babylonian.

ANSWER: cuneiform

[10] The Amarna Letters are unusual for being written in Akkadian cuneiform, despite many of them being from this polity's Eighteenth Dynasty-ruler Akhenaten.

ANSWER: New Kingdom [prompt on "Egypt"]

[10] If you were to actually read the Amarna Letters, you would often run across this cuneiform sign, which functions more or less as a prefix meaning "God." In Akkadian, it corresponds more or less to the Semitic prefix "il" or "el," which became "Allah."

ANSWER: DINGIR [or AN; prompt on "D"]

4. Name some jazz trumpeters. For 10 points each:

[10] This cat was a session musician throughout the 60s. With Don Cherry, he played trumpet on Ornette Coleman's *Free Jazz*. His own albums include *First Light*, *Hub-Tones*, and *Red Clay*.

ANSWER: Freddie Hubbard [or Frederick Dewayne Hubbard]

[10] This trumpeter wrote "Salt Peanuts" and "A Night in Tunisia." Known for his bent trumpet and puffed-out cheeks, he innovated bebop with Charlie Parker.

ANSWER: Dizzy Gillespie [or John Birks Gillespie]

Commented [1]: easy part pls

Commented [2]: do we have "descartes" anywhere?

[10] This trumpeter made a popular recording of W. C. Handy's "St. Louis Blues" with Bessie Smith. He also made a 1954 album of W. C. Handy's music.

ANSWER: Louis Armstrong [or Satchmo; or Pops]

5. A parenthetical statement in the poem about this figure notes that "Malignant Fate sat by, and smil'd." For 10 points each:

[10] Name this figure, who "mew'd to every watery God" after she "stretch'd, in vain, to reach the prize" and plunged into a bowl of water.

ANSWER: Horace Walpole's cat [accept Selima; accept, but do not reveal, Thomas Gray's favorite cat]

[10] This English poet wrote "Ode on the Death of a Favorite Cat," as well as "Elegy Written in a Country Churchyard."

ANSWER: Thomas Gray

[10] Gray wrote how "My lonely anguish melts no heart but mine" in a sonnet on the death of this man, which appears in the preface to another poet's *Lyrical Ballads*.

ANSWER: Richard West

6. This man's murder was broadcast in the streets on large television screens. For 10 points each:

[10] Name this Jordanian pilot who was burned alive on January 3, 2015, after a mechanical failure caused him to crash over ISIS occupied territory in Syria.

ANSWER: Muath al-Kasasbeh

[10] The screening of his murder took place in this city, an ISIS stronghold in the north of Iraq. The Jordanian Air Force responded to the murder by bombing this city, killing 55 militants.

ANSWER: Mosul

[10] Just prior to al-Kasasbeh's death, the Japanese journalist Kenji Goto was killed in this manner. Several videos of people killed in this manner by "Jihadi John" have been released by ISIS.

ANSWER: beheading [or decapitation or equivalent]

7. As part of its "survival pending revolution" program, this organization provided free breakfasts to schoolchildren in Oakland. For 10 points each:

[10] Name this militant black power organization, which was founded by Bobby Seale and Huey Newton.

ANSWER: Black Panther Party

[10] The Black Panthers were one of the groups that this extensive FBI surveillance program, launched by J. Edgar Hoover, sought to undermine.

ANSWER: COINTELPRO [or Counter Intelligence Program]

[10] This former UCLA professor and member of the Black Panthers was put on trial for her alleged role in the attempted kidnapping of Judge Howard Haley at a Marin County courthouse.

ANSWER: Angela Yvonne Davis

8. In a poem written in this language, the Georgian princess Tamara dies after kissing the title character. For 10 points each:

[10] Name this language used to write "The Demon," and a poem commemorating a battle in the Napoleonic Wars entitled "Borodino."

ANSWER: Russian

[10] Those aforementioned poems were written by this poet of the Caucasus, who also wrote the novel *A Hero of Our Time*.

ANSWER: Mikhail Lermontov

[10] In a poem by Lermontov, a boy flees from one of these places, kills a panther with a stick, and then accidentally wanders back to it. In a Hermann Hesse novel, Narcissus remains in one of these places while his friend Goldmund leaves to become a sculptor.

ANSWER: monasteries [or obvious equivalents like abbeys or cloisters]

9. The use of the serpentinata style of figure in this art period may have been inspired by the discovery of the Laocoön group. For 10 points each:

[10] Name this art style of the late Renaissance. Its focus on elongated figures is exemplified by Parmigianino's *Madonna of the Long Neck*.

ANSWER: Mannerism [accept word forms]

[10] Agnolo Bronzino depicted several flying putti carrying a cross and a column near the top of his depiction of this scene, which shows a blue-clad Mary cradling the body of Jesus. The Capponi Chapel is home to Jacopo Pontormo's brightly-colored depiction of this scene.

ANSWER: Deposition of Christ [or Descent from the Cross]

[10] This Mannerist artist depicted an oddly green-shaded Jesus in his *Deposition*, which is his best known work. He was one of the leading artists of the First School of Fontainebleau.

ANSWER: Rosso Fiorentino

10. The power of these objects can be measured in diopters. For 10 points each:

[10] Identify these glass objects that focus light beams through refraction.

ANSWER: lenses

[10] This type of aberration occurs because glass refracts different colors at different angles, which causes an image to be unfocused.

ANSWER: chromatic aberration

[10] The amount of chromatic aberration is proportional to this quantity, which measures the dispersive power of a transparent medium. It roughly measures how dispersion relates to index of refraction.

ANSWER: Abbe number [accept V-number or constringence or reciprocal dispersion]

11. During this war, Benjamin Adekunle became infamous for his food blockades and starvation tactics. For 10 points each:

[10] Name this 1967 to 1970 war in which the oil-rich Igbo tried to secede.

ANSWER: Nigerian Civil War [or Biafran War; or anything mentioning Biafra]

[10] Other Nigerian military leaders during the war included this general, who later took over Nigeria in a 1976 coup, although he transitioned the country back to democracy. He was so popular that he was also Nigeria's democratically elected president from 1999 to 2007.

ANSWER: Olushegun Obasanjo

[10] In the aftermath of the Nigerian Civil War, French physician Bernard Kouchner co-founded this international humanitarian aid organization. Like the Red Cross, it provides medical services to regions in need.

ANSWER: Médecins Sans Frontières [or Doctors Without Borders; or MSF]

12. This author wrote a poem about an object that "hides our cheeks and shades our eyes." For 10 points each:

[10] Name this author of "We Wear the Mask" who in another poem, wrote of a creature that "beats his wing / Till its blood is red on the cruel bars" in "Sympathy."

ANSWER: Paul Laurence Dunbar

[10] Dunbar's "Sympathy" provides the title for this author's memoir *I Know Why the Caged Bird Sings*. She read her poem "On the Pulse of Morning" at Clinton's inauguration.

ANSWER: Maya Angelou

[10] Dunbar also wrote this poem, whose lines "Be proud, my race, in mind and soul; Thy name is writ on Glory's scroll" were used in William Grant Still's *Afro-American Symphony*.

ANSWER: "Ode to Ethiopia"

13. Name some stuff about baptism in different churches. For 10 points each:



[10] In Catholicism, Baptism is one of these rites. There are seven of these, and they include Anointing of the Sick and Marriage.

ANSWER: sacraments

[10] This church believes that people can only get baptized after an “age of accountability.” Twelve Oxen statues are located beneath the font in another baptism ritual that this faith practices.

ANSWER: Mormon Church [or Church of Jesus Christ of Latter-Day Saints]

[10] Before being baptized into this denomination, one must answer about 80 questions in front of three elders of the Church. Those rules are found in this denomination’s manual *Organized*.

ANSWER: Jehovah’s Witnesses

14. This man’s publication of “Experimental Studies of the Perception of Movement” led to the founding of the school he is associated with. For 10 points each:

[10] Name this co-founder of Gestalt psychology who first defined the phi phenomenon.

ANSWER: Max Wertheimer

[10] This American Gestalt psychologist conducted impression experiments, as well as a notable experiment studying conformity in which subjects had to estimate the lengths of lines.

ANSWER: Solomon Asch

[10] Asch studied the suggestion of this characteristic in an experiment that attributed a quotation inciting rebellion to either Vladimir Lenin or Thomas Jefferson. Max Weber wrote that social stratification took the form of power, property, and this characteristic.

ANSWER: prestige [prompt on “reputation”; accept status]

15. These proteins are labelled E, L, or P, based on whether they appear in epithelial cells, lymphocytes, or platelets respectively. For 10 points each:

[10] Name these proteins that commonly bind to Sialyl-Lewis<sup>x</sup>. They help lymphocytes to “roll” along blood vessels.

ANSWER: selectins [or cluster of differentiation 62]

[10] Selectins are a type of lectin, which are proteins that bind to this general class of compounds that includes glycogen and amylopectin. Adding one of these to a protein results in a glycoprotein.

ANSWER: carbohydrates [or sugars]

[10] One example of a lectin is wheat germ agglutinin, which binds to the N-acetylglucosamine found in this protein found on bacterial cell walls. Fluorescently labelled forms of WGA are useful for staining this protein.

ANSWER: peptidoglycan

16. A ceremonial helmet that may have belonged to Rædwald of East Anglia was unearthed at this site. For 10 points each:

[10] Name this archaeological site in Suffolk where a number of burial mounds were excavated by Basil Brown.

ANSWER: Sutton Hoo

[10] King Rædwald was possibly buried in one of these objects at Sutton Hoo. Viking examples of these objects are often depicted with red and white sails and dragon-headed prows.

ANSWER: ships [or longships; or obvious equivalents like boats]

[10] Rædwald fought Aethelfrith at the Battle of the River Idle on behalf of this man, who then became King of Northumbria. This king was converted to Christianity by Paulinus and died at the Battle of Hatfield Chase.

ANSWER: Edwin of Northumbria [or Eduinus]

17. Answer the following about Twin Towers. For 10 points each:

[10] Probably the most famous Twin Towers were Minoru Yamasaki-designed skyscrapers in this New York city complex.

ANSWER: World Trade Center [or WTC; accept Ground Zero]

[10] The bases of Kuala Lumpur's Petronas Twin Towers are based on this shape, in a nod to Islamic art, although circles were added to add floor space. Description acceptable.

ANSWER: an eight-pointed star [or octagram; or Rub' el-Hizb; accept answers describing two interlocking squares or any reasonable equivalent for "eight-pointed star"]

[10] Philip Johnson designed the twin "Gate of Europe" Towers for this city. Yamasaki also designed a skyscraper for this city's AZCA financial district.

ANSWER: Madrid

18. A character in this play tickles another man before repeatedly poking him and demanding "move over." For 10 points each:

[10] Name this one-act play in which Jerry rambles to the publishing executive Peter on a bench in Central Park before impaling himself upon a knife held by him.

ANSWER: The Zoo Story

[10] *The Zoo Story* is by this playwright, who wrote a play in which Nick and Honey spend the evening with the bickering couple George and Martha entitled *Who's Afraid of Virginia Woolf?*

ANSWER: Edward Albee

[10] In *The Zoo Story*, Jerry gives a lengthy monologue describing his attempt to kill one of these animals with a poisoned hamburger.

ANSWER: a dog

19. The spectral theorem gives a decomposition that puts these numbers on the diagonals. For 10 points each:

[10] Name these values. Their sum is equal to the trace, and their product gives the determinant.

ANSWER: eigenvalues [or characteristic values; or latent roots; or proper values; prompt on "lambda"]

[10] Eigenvalues are defined for a square one of these entities. These things, which can be thought of as a bunch of column vectors in a row, are the basic object of study of linear algebra.

ANSWER: matrices [accept word forms like matrix]

[10] Another matrix decomposition puts these numbers on the diagonals of a matrix multiplied on the left by a unitary or orthogonal matrix, and on the right by that matrix's conjugate transpose. These numbers are the eigenvalues of a matrix multiplied on the left by its conjugate transpose.

ANSWER: singular values [prompt on "sigma"]

20. This figure once tracked down and ate the Wawalag sisters by tracing the scent of their menstrual blood. For 10 points each:

[10] Name this creator god common to the myths of the Australian Aborigines. He is said to have created the Earth during Dreamtime.

ANSWER: Rainbow Serpent [or Yurlungur]

[10] The Rainbow Serpent created this substance by tickling the bellies of frogs. This substance later filled places like billabongs.

ANSWER: water

[10] Blood is very much enjoyed by this legendary creature from Aboriginal folklore, which sucks it out using the suckers in its feet. It looks like a little red man with a large head.

ANSWER: Yara-ma-yha-who