

Terrapin Invitational Tournament 2013: “Make your own judgments, but we wrote this set in good faith”  
Packet by St. Joseph + Rutgers

Tossups

1. One of these figures can be seen standing next to a chariot in the Belvedere Altar. A sculpture of that one of these figures depicts him as a priest, but that sculpture lost its arms due to time. An eight-and-a-half-foot bust of one of these figures from the 4th century is what mostly remains of a once-colossal statue of him. A portrait bust of a rather insane one of these figures shows him holding two apples in one hand, a club with the other hand, and a Herculean lion skin that adorns his head. A sculpture named after one of them was built by Apollodorus of Damascus and commemorates a victory over Decebalus. The only surviving bronze equestrian statue from antiquity is of one of these figures. The victory of one of these figures over the Dacians is commemorated in a namesake Column. For 10 points, identify these rulers, examples of whom include Commodus, Trajan, and Augustus.

ANSWER: Roman emperors

[edit]

2. This figure sent his ambassador Latif Agha with a pair of keys to the ruling emperor to feign his subordination. He spent three years having the Mahmoudiyah Canal constructed. His son's campaign against Abdullah I ended with the siege of Diriyah, which suppressed and destroyed Wahabi attempts at creating a free state and the First Saudi State. This ruler's demands led to the Battle of Konya, which saw territorial gains that were later reversed in the aftermath of the Battle of Nezib, where forces loyal to him were commanded by his son. That aforementioned son, Ibrahim, got his ass kicked by Edward Codrington's fleet during the Battle of Navarino. This man ended over 600 years of dynastic rule by slaughtering Mamelukes in the Citadel. This native Albanian came to power after ruling an area that was a part of Selim III's empire. For 10 points, name this so-called “father of Modern Egypt.”

ANSWER: Muhammad Ali Pasha al-Masud ibn Agha [prompt on partial names; accept Mehmet for Muhammad]

3. Thermionic emission was explained as acting through this phenomenon by Fowler and Nordheim. A WKB approximation in the case that the classical momentum is imaginary can be used to show that the spatial wave function decays exponentially in some regions due to this phenomenon. Oscar Klein described a counterintuitive result in which an increase in potential increases the rate of this phenomenon, and George Gamow discovered the role of this phenomenon in alpha decay. Gerd Binnig and Heinrich Rohrer used this phenomenon to develop a type of microscope which utilizes an electrically conductive metal tip and a voltage bias to measure the current of electrons between the tip and the surface. For 10 points, name this phenomenon that allows particles to “jump” over a barrier, an impossibility in classical physics.

ANSWER: quantum tunneling

4. The origins of this idea “in modern society” is examined in a book by Roberto Unger. Jeremy Bentham's student John Austin developed a positive approach to this idea. A book that proposes the rule of recognition champions a different positivist approach to understanding this entity, and Frank Easterbrook is a prominent scholar in a field that uses economics to analyze it. It titles a book by HLA Hart and is equated with “integrity” in the works of a thinker who used a metaphor of Judge Hercules to evaluate whether it works within a society. That theorist, Ronald Dworkin, wrote about its “Empire.” For 10 points, name this system of rules that attempt to ensure justice.

ANSWER: law [or laws]

[edit]

5. In this work's prologue, an old man argues that cheese produced by animals eating in a different valley is not as good as the cheese produced when they eat in their home valley. Scenes in this play include a wedding and a funeral occurring simultaneously, which ends with the reveal that Yussup is not actually dead. After meeting her brother

Lavrenti, its main character crosses into the Northern Mountains in an attempt to escape the Ironshirts. In this play, the soldier Simon Shashava flirts with a woman who weds a horrid peasant after she is forced to flee from Nuka with the governor's baby. In the end, Grusha is awarded the child Michael by Azdak after she refuses to pull the child from the title drawing. For 10 points, name this Bertolt Brecht play.

ANSWER: The *Caucasian Chalk Circle* [or Der *Kaukasische Kreidekreis*]

6. During this man's presidency, Anne-Marie Casteret's book *Blood Scandal* was published, which detailed how over 1,000 hemophiliacs became infected with HIV due to his health minister's negligence. This non-Georgian came to power in the so-called Rose Revolution, leading him to quickly enact laws stipulating a 39-hour work week and a 10% increase in minimum wage. His unpopularity following some education legislation led him to dismiss Pierre Mauroy and nominate Laurent Fabius. Due to a global oil crisis, he was able to defeat the incumbent during a runoff. Under this man's government, the DGSE extradited Klaus Barbie from Bolivia and sank the Greenpeace vessel *Rainbow Warrior*. In 1986, he nominated Jacques Chirac as Prime Minister, which kicked off a period of cohabitation. For 10 points, name this president of France from 1981 to 1995, a leader of the French Socialist Party.

ANSWER: François Mitterrand

[edit]

7. The Szyszkowski equation describes how this property decreases in aqueous solutions of carboxylic acids, alcohols, and esters, and Jurin's height is proportional to this value. One experimental method used to measure this property involves measuring the force while slowly lifting a platinum ring and is named for du Noüy. According to one rule, this quantity varies linearly with the temperature and inversely with volume to the two thirds. The Young-Laplace equation describes pressure differences between two static fluids caused by this property, which inorganic salts can increase. Sugars have little to no effect on this property, which at constant temperature and pressure is equal to Gibbs free energy per area. Dynes per centimeter are the units of, for 10 points, what property of liquids caused by cohesive forces, which can be lowered by surfactants, and which allows some bugs to walk on water?

ANSWER: surface tension

8. Stephanus of Byzantium states that after one of these events a trio of figures turned white and jumped into the sea at Aptera. In Book VI of the *Aeneid*, Aeneas's men bury a man that was killed by Triton after participating in one of *these*; that man is Misenus. Instead of having sex for a series of consecutive nights, a boast at one of these events basically caused Thamyris to go blind and become maimed. One of these events inspired by Hera's goading included the creation of a series of crowns for the children of King Peirus and saw the sirens kill themselves. Another of these events took place at Mt. Tmolus and ended with one figure being given the ears of an ass by the victorious Apollo. Marsyas was flayed alive by Apollo after losing, for 10 points, what kind of event, which followed his discovery of Athena's *aulos*, or double-flute?

ANSWER: musical contest [accept clear knowledge equivalents; accept singing contest or more specific answers like lyre contest]

[edit]

9. One fable written in the language of this name is about a lion who encounters various animals, all of whom conclude man is conniving and evil. Miriam Lichtheim is a scholar on the literature of this language, which was used to produce a *stela* about Bentresh, a woman who is cured by Khons. An author of the nationality of this name wrote about Amina and Kamal, the latter of whom helps lead his father Al-Sayyid Ahmad home after an air raid. Although it is not Greek, many works in the ancient language of this name are written in a cursive script called Demotic. One author with this nationality wrote extensively about the Al-Jawad family, as well as books such as *The Thief and the Dogs*. For 10 points, name this nationality of the author of *Palace Walk* and *Sugar Street*, Naguib Mahfouz.

ANSWER: Egyptian [accept Ancient Egyptian; accept Demotic before mentioned]

10. One speech given by this politician calls on Otto Reich, Roger Noriega and Barack Obama to stop a Pentagon plan to assassinate his current political rival. This enthusiastic follower of guru Sai Baba's teachings is married to a woman that is currently the attorney general of their country. One of his political rivals is a founder of the Justice First Party. This man will face off against that political rival, a former governor of Miranda named Henrique Capriles, in a April 2013 special election. This man came to power after his country's president died after returning from Cuba a third time for medical treatment. For 10 points, identify this politician who is currently the interim president of Venezuela.

ANSWER: Nicolás **Maduro** Moros

11. William Stinchcombe, who wrote the defining work on this historical incident, identified a worker for a Dutch banking syndicate named Nicholas Hubbard as one participant in this event. Hubbard and other participants in this event were based out of the Holland Land Company. In the wake of this incident, Timothy Pickering led a faction that pushed for war, and the leader of the opposition to that faction saw his house stoned. That man, Elbridge Gerry, had also been present at the impetus for this event, along with men like Lucien Hauteval. Also present were men like John Marshall and Charles Pinckney, and this event prompted the famous quotation "But not a cent for tribute!" For 10 points, name this international incident where pseudonymous French diplomats demanded bribes and loans from Americans.

ANSWER: **XYZ** Affair

12. In one section of this work, the author imagines a pot from a fairy tale that has been given the power of speech and hearing to discuss whether fairy tales talk nonsense about pain. Another section of this treatise compares the plurality of its subject to the proliferation of cards and other activities, illustrating the author's thoughts on "family resemblances." It begins with a discussion of a quote by Augustine, to distinguish between a system of communication and this work's main subject. This work, which was written as a series of numbered aphorisms and has been translated into English by G.E.M. Anscombe, also includes a thought experiment in which people write a capital S in a diary after every time they feel a particular sensation. This posthumously published work also contains its author's beetle in a box thought experiment to refute the notion of a private language. For 10 points, name this book by Ludwig Wittgenstein.

ANSWER: ***Philosophical Investigations*** or ***Philosophische Untersuchungen***  
[edited]

13. One character visits this location on earth by disguising himself as a toad before he whispers into the ears of a sleeping woman. That character leaves this location after the descent of a pair of golden scales. After achieving a victory at this location, a villain returns home and hears hisses instead of applause and sees a grove of trees have all their fruit turn into ash. A storyteller speaking to one of this location's inhabitants describes how Abdiel tried to mediate a conflict between a loser that fell for nine days through Chaos. That dude telling a story at this location describes how the winning army in that conflict used mountains to bury their foes. While speaking to its inhabitants, Raphael invokes Urania to describe the Creation of the world. A sexual encounter between its two inhabitants results in guilt and shame being exposed for the first time; that happened because they both ate a piece of forbidden fruit. For 10 points, identify this location that Adam and Eve lose in a poem by John Milton.

ANSWER: **Paradise** [accept the garden of **Eden**]  
[edited]

14. The exposure of CCDs on the ground is limited by these particles, which creates a namesake background that can lead to the detection of false stars. The Haverah Project is an ongoing project that detects them. Atmospheric fluorescence is the basis for the Pierre Auger Observatory's method of finding them. PAMELA, CHICOS, and CASA are projects researching the effects of these particles, which interact with other nucleons during a namesake

spallation process that is one source of baryonic matter. They produce pions and kaons when they collide with particles in Earth's atmosphere and are composed of 90% hydrogen nuclei and 9% alpha particles. For 10 points, what are these high energy particles that bombard Earth's surface?

ANSWER: cosmic rays

[edited]

15. This musical piece's third act bizarrely depicts "the feast of lights." Beethoven composed 12 variations on one song in this musical work for cello and piano. The libretto for this piece, which was written by Thomas Morell, includes "Sound the Alarm" and "We Will Never Bow Down." It ends with a chorus singing the words "Amen" and "Hallelujah." Characters depicted in this work include the Seleucid commander Gorgias. It was composed after the Duke of Cumberland returned victorious from the Battle of Culloden. This oratorio's "See the Conqu'ring Hero Come" inspired variations by Beethoven and was the basis for Edmond Budry's hymn "Thine be the Glory." For 10 points, name this religious work by Handel about a Jewish hero.

ANSWER: Judas Maccabeus

[edited]

16. Suetonius relates that while this man was an aedile, Nero's troops randomly kidnapped him and loaded his toga with mud since he couldn't keep the streets clean. While serving under Aulus Plautius, he commanded a force that captured the first *oppida* on the Isle of Wight. After Licinius Mucianus failed to suppress the first Jewish Revolt, this man successfully did so. This man sent Agricola to conquer the rest of Britannia and began the construction of the Coliseum. On his deathbed, this ruler supposedly said "Dear me! I think I am becoming a God!" Troops loyal to this man, including Otho, were victorious at the Battle of Bedriacum, leading to the deposition of Emperor Vitellius in 69 A.D. For 10 points, identify this father of Titus, the founder of the Flavian dynasty who put an end to the conflict surrounding the Year of the Four Emperors.

ANSWER: Titus Flavius Caesar Vespasianus Augustus [prompt on "Flavian" or "Flavius," but do not prompt on any other partial names]

[edited]

17. One character in this novel is deeply disturbed by the news of the self-immolation of many monks. Divided into the three sections "Paradise Remembered," "The Fall," and "Paradise Lost," the end of its first section documents numerous debates about whether or not it is appropriate for a character's daughter to visit New York City. This work's protagonist refuses to have sex with Rita Cohen when blackmailed and is married to a woman who has an affair with Bill Orcutt. This novel's protagonist learns that his daughter has converted to Jainism after he admits his wife, a former Miss New Jersey winner, into a mental hospital. It traces the aftermath of Merry's decision to blow up a post office during the Vietnam War. For 10 points, name this novel narrated by Nathan Zuckerman about Swede Levov, a work of Philip Roth.

ANSWER: American Pastoral

[edited]

18. A book written by the founder of this group includes a section titled "The New Commandments," which details the renting of goods for periods of forty-nine years and advocates the need for a common language and currency. This group was founded following an encounter at either Puy de Lassolas or Puy de la Vache, which was related in *The Book Which Tells The Truth*. The official symbol of this group is a swastika embedded in the Star of David. Ideas put forth by the founder of this group include economic humanitarianism and geniocracy. One organization associated with this group is headed up by Brigitte Boisselier and came under fire after it claimed that it had cloned a human baby. Followers of this faith believe that humans arose through DNA manipulation by a race of beings known as the Elohim. For 10 points, name this UFO religion founded in 1974 by Claude Vorilhon.

ANSWER: Raëlism [or Raëlian Movement]

19. Odilon Redon depicted one of these objects embedded in a cube using charcoal and white chalk on yellow tone paper. In Michael Baxandall's *Painting and Renaissance in Fifteenth Century Italy*, he suggests that artists employ a "period" one. A different painting by Odilon Redon shows a creature with a pronounced one of these body parts extending from the background of a mountain. A section of a treatise which compares Doric temples to automobiles and argues that airplanes embody the machine age is titled for these parts, which do not function the way they should - that section of a larger work appears in *Towards a New Architecture*. A calf was famously used to help film a scene involving Simone Mareuil, who has this body part slashed in *Un Chien Andalou*. A light bulb is embedded in one in Picasso's painting *Guernica*. For 10 points, identify this body part which may or may not follow you around in *The Laughing Cavalier*.

ANSWER: eyes

20. This enzyme was shown to be a component of the complex pol II holoenzyme, implying that this enzyme is necessary for CDC. Antibiotics like quinolones target these enzymes by forming a complex that inhibits these molecules' ligase domains but not their nuclease domains, and cancer drugs like amsacrine and camptothecins target these enzymes. Gyrase is a member of the type II class of these enzymes, which reduces linking number by two. The first one was discovered in *E. coli* by Wang. These enzymes are needed because of tension introduced by the function of helicase. For 10 points, name this class of enzymes that create small breaks to help to reduce coiling and supercoiling in DNA.

ANSWER: topoisomerases I or II

[edited]

Extras

21. One of these events was ordered by Ogedei Khan as a response to the death of the envoy Chu-Ku-Yu. A common response to these events was the formation of militias called Righteous Armies. The aftermath of one of these conflicts was the establishment of the Protectorate General to Pacify the East, which was lead by Xue Rengui. A battle during one of these conflicts saw a dam opened to drown soldiers in the Salsu River. A set of these campaigns is sometimes referred to by the water dragon year Imjin, and that campaign saw the Admiral Yi bring back the Turtle Ship to devastate an attacker's navy. For 10 points, name this action which was attempted by Toyotomi Hideyoshi as well as Wendi of the Sui dynasty, an attempt to conquer a certain peninsula.

ANSWER: invasions of Korea [accept anything that suggests a military campaign on the Korean Peninsula; accept Goryeo in place of Korea until "Protectorate"]

Bonuses

1. Its rulers descend from a son of the Cham dynasty in Vietnam. For 10 points each:

[10] Name this sultanate founded by Ali Mughayat Syah that conquered Penang and fought against Malacca. The GAM is a guerilla movement that wished to free the modern day state of this name.

ANSWER: Aceh sultanate [pronounced "ah-cheh"]

[10] The Aceh sultanate was based in northern Sumatra in this modern day nation, whose leaders included Suharto.

ANSWER: Republic of Indonesia

[10] The founding sultan went to Sumatra with his father after the conquest of the Champa kingdom by this long-reigning Vietnamese dynasty. It saw the rule of the Nguyễn and Trịnh Lords as well as the Tây Sơn Rebellion.

ANSWER: Lê dynasty

2. Its first act takes place during an upcoming ice age, and its three acts feature three reincarnations of the maid Sabina. For 10 points each:

[10] Identify this play about the troubles of George Antrobus, his wife, and their children Gladys and Henry in New York City.

ANSWER: *The Skin Of Our Teeth*

[10] This American author of *Our Town* wrote *The Skin of Our Teeth*.

ANSWER: Thornton Niven Wilder

[10] Adapted from his own *The Merchant of Yonkers*, Wilder also wrote this farce, in which Horace Vandergelder is brought to marry Dolly Levi and to allow his niece, Ermengarde, to wed Ambrose Kemper.

ANSWER: *The Matchmaker, a Farce in Four Acts*

3. Elias Canetti wrote a book on them and power. For 10 points each:

[10] Gustave Le Bon wrote a treatise on them subtitled “A Study of the Popular Mind” which suggests that these aggregates are sensitive to emotional suggestion by a leader.

ANSWER: crowds [accept equivalents like throngs and gaggles; prompt on “groups”]

[10] Le Bon specifically states that this type of figure can alter crowd psychology. Along with authority from laws and authority from tradition, it is the other source of authority in a tripartite classification found in “Politics as a Vocation.”

ANSWER: charisma [or charismatic leader]

[10] This thinker wrote “Politics as a Vocation.” His book *The Protestant Ethic and the Spirit of Capitalism* ties religion to the rise of the nation-state.

ANSWER: Max Weber

4. The Winkler test is a version of this process used to determine the concentration of dissolved oxygen in water. For 10 points each:

[10] Name this technique for finding the concentration of a solute in a solution in which another solution is slowly added to the analyte and swirled around until eventually the color from the indicator doesn’t immediately fade.

ANSWER: titration

[10] EDTA is a common titrant in this process which titrates metals. In this kind of titration, the analyte and titrant weakly bind to form a colored compound.

ANSWER: complexometric

[10] Another lab technique that involves titration is this one that measures the amount of an antigen in a sample by allowing antibodies to bind to them, and then allowing another chromogenic enzyme to bind to the antibodies.

ANSWER: ELISA [or EIA or Enzyme Linked Immunosorbent Assay]

5. This man’s image of several men lying wounded in a trench entitled *Dead Troops Talk* sold for \$3.7 million in 2012, making it the third most expensive photograph ever sold. For 10 points each:

[10] Name this conceptualist photographer, who depicted a White man using his finger to mock an Asian man while walking down a street in his *Mimic*.

ANSWER: Jeff Wall

[10] The second most expensive photograph ever sold was the product of this artist, who created the *Centerfolds* and *Untitled Film Stills* series.

ANSWER: Cindy Sherman

[10] In 1992, Sherman released a series depicting graphic and grotesque sex using medical dolls and prosthetics as part of the artistic discussion of this organization’s funding of artists like Robert Mapplethorpe and *Piss Christ* artist Andres Serrano. Barack Obama appointed Rocco Landesman to chair this organization in 2009.

ANSWER: National Endowment for the Arts [or NEA]

6. Teach whoever the hell submitted this bonus on Faroese literature that it’s a dumb idea, by answering some things about real Scandinavian literature. For 10 points each:

[10] Many Faroese writers that you most likely don't give a shit about, like William Heinesen and Jorgen-Frantz Jacobsen - who were parts to this bonus, wrote in this language. It's the language of Hans Christian Andersen.

ANSWER: **Danish** [or **Dansk**]

[10] This author wrote of the strange goings-on at Snæfellsjökull, including the attempted resurrection of Godman Syngman, as recorded by the emissary of the bishop, or "Embi" in his *Under the Glacier*. He also wrote *Independent People*.

ANSWER: Halldor Kiljan **Laxness** [or Halldor Kiljan **Guðjonsson**]

[10] Par Lagerkvist authored this modernist retelling of the New Testament, which begins with the crucifixion of Jesus and includes multiple scenes in which the title Biblical character encounters a woman with a harelip.

ANSWER: **Barabbas**

7. This beast is said to preside over Nastrond where it sucks the blood out of perjurers, murderers, and adulterers. For 10 points each:

[10] Name that serpent that chews on the roots of the Yggdrasil, and who insults the eagle at the top of Yggdrasil through messages carried by Ratatoskr.

ANSWER: **Nidhogg** [accept **Níðhöggr**]

[10] This goddess, a sibling of Fenrir and Jormungandr, is the only being who can control Nidhogg. She was cast into Niflheim, and was given power over it.

ANSWER: **Hel**

[10] Another dragon from Norse myth, Fafnir, was previously one of these creatures, before he became too greedy. His brother Regin was also one of these creatures.

ANSWER: **dwarfs** [accept **Dvergjar**]

8. This man gained a fiefdom from King Charles the Simple with the signing of the Treaty of Saint Clair-sur-Epte. For 10 points each:

[10] Name this father of William Longsword and wife of either Poppa or Gisela. His conversion to Christianity gave him control of a certain French region, though by the time he died, he had to massacre a hundred Christian prisoners to keep himself sane.

ANSWER: **Rollo** [accept **Robert I** or Ganger **Hrolf**]

[10] Rollo was the first duke of Normandy, which was centered around this city. When Philip Augustus annexed Normandy, he and Baldwin of Flanders first laid siege to this capital of it.

ANSWER: **Rouen**

[10] One of Rollo's descendants was this Norman husband of Matilda of Flanders, whose magistrates compiled the Domesday Book 20 years after he came to power. This man defeated Harold Godwinson at the Battle of Hastings.

ANSWER: **William the Conqueror** [accept **William I** or **William the Bastard**; prompt on "William"]

9. One section of this piece depicts a Fourth of July picnic and takes its name from an area that honors Israel Putnam's achievements during the Revolutionary War. For 10 points each:

[10] Identify this piece, two of whose sections are "Putnam's Camp" and "The Housatonic at Stockbridge."

ANSWER: **Three Places in New England**

[10] *Three Places in New England* is by this American composer who also wrote *The Unanswered Question*.

ANSWER: Charles Edward **Ives**

[10] This 19th century American composer was known for the "cultural ragbag" style of music, drawing inspiration from the French Quarter and Italian Romantic opera. His first symphony is called *A Night in the Tropics* and his other notable works include *Grand Tarantelle*.

ANSWER: Louis Moreau **Gottschalk**

10. Gastrointestinal bleeding caused by this disease can lead to hematemesis. For 10 points each:

[10] The Modified Johnson Classification is applied to this common condition in which there are holes in the mucosa of the gastrointestinal tract that tend to occur in the stomach and duodenum.

ANSWER: peptic ulcers [or stomach ulcers]

[10] Despite the claims that stress is the cause of peptic ulcers, Marshall and Warren proved that this gram-negative bacteria caused gastritis and peptic ulcers.

ANSWER: Helicobacter pylori

[10] NSAIDs can cause or worsen ulcers by inhibiting this enzyme which is involved in inflammation.

ANSWER: COX [accept cyclooxygenase or prostaglandin-endoperoxide synthase or ptgs]

11. Name some Middle Eastern and Asian poets. For 10 points each:

[10] This author of “Before the Cask of Wine” declared why “arms / Were so seldom used by benign sovereigns” in “Nefarious War.” This contemporary of Dù Fǔ supposedly died while trying to embrace a reflection of the moon in a pond.

ANSWER: Lǐ Bái [accept Li Bo or Li Po; prompt on partial name]

[10] This Japanese author was a student of Shōmyō and wrote many lyrics in the *Senzaishū* that have been set to *biwa* music. He is better known for his essay about the transience of the world, *Hōjōki* or *An Account of My Hut*.

ANSWER: Kamo no Chōmei

[10] This poet’s major work includes a story about a jackal that pretended to be a peacock as well as a story about wine being turned into honey to symbolize ritual purity. That collection is this author’s *Masnavi*.

ANSWER: Jalāl ad-Dīn Muhammad Rūmī

12. For 10 points each, name these things about makers of chocolates.

[10] Supposedly inspired by the shape of the Matterhorn this Swiss chocolate is known for its triangular prism shape.

ANSWER: Toblerone

[10] Ghirardelli is not a fancy Italian maker of chocolates, but rather a San Francisco based branch of this other Swiss company. Their most notable product is individually wrapped truffle balls of chocolates with a liquid filling, which is named Lindor.

ANSWER: Lindt

[10] This Belgian maker of chocolates makes a “g” collection of chocolates that are pricey as hell, costing \$125 per box. Its presence in the Americas is due to the fact that it was purchased by Campbell’s.

ANSWER: Godiva

13. A starting point for calculations in statistical mechanics is the axiom that each one of these is equally likely, and in most cases a sum over all of them can be converted to an integral over phase space. For 10 points each:

[10] Name these specific configurations of the particles in a thermodynamic system. Two different such configurations may still have the same observable properties like temperature and volume.

ANSWER: microstates [prompt on “multiplicity”]

[10] In the statistical interpretation given by Boltzmann, each microstate being more likely means that the system tends towards macrostates with more corresponding microstates, and thus more entropy. It is often stated as “entropy always increases.”

ANSWER: second law of thermodynamics

[10] In the canonical ensemble, the number of microstates is replaced by the partition function. This variable is equal to negative temperature times Boltzmann’s constant times the natural log of the partition function.

ANSWER: Helmholtz free energy [prompt on “energy” or “free energy” or “*F*” or “*A*”]

14. Name some famous American doctors, for 10 points each:



[10] This Army doctor is credited with helping figure out that it was certain mosquitoes that transmit yellow fever. In return, an army medical center in Washington DC was named after him.

ANSWER: Walter **Reed**

[10] One of the first men to identify yellow fever's symptoms and scope was this founding father and doctor, who served as Surgeon General to the Continental army during the Revolution.

ANSWER: Benjamin **Rush**

[10] A popular urban legend claims that this African American doctor died after being refused a blood transfusion in a hospital, a technique this doctor ironically helped pioneer. The legend isn't true.

ANSWER: Charles R. **Drew**

15. This thinker discussed the sphere of freedom in his *Foundations of Natural Right* and responded to Jacobi's criticisms of his doctrines with his popular *The Vocation of Man*. For 10 points each:

[10] Name this man whose doctrine of *Wissenschaftslehre* is introduced in *Foundations of the Science of Knowledge*.

ANSWER: Johann Gottlieb **Fichte**

[10] Fichte was catapulted into philosophic stardom after publishing this work, initially thought to be by Kant. It argues that "revealed" religious elements must undergo Kantian scrutiny in order to be useful to society.

ANSWER: **Attempt at a Critique of All Revelation** [or **Versuch einer Kritik aller Offenbarung**]

[10] Fichte's dispute with Forberg basically arose from a dispute about Fichte taking this stance. A modern day thinker who believed in this stance is the late Christopher Hitchens.

ANSWER: **atheism** [accept word forms]

16. Basavriuk threatens to stick Father Athanasii's throat together with boiled kutya, in this work, in which Korzh comes upon Peter and his daughter kissing. For 10 points each:

[10] Name this story in which Peter slowly goes insane after forgetting that he killed Ivas. After remembering upon seeing a witch Peter suddenly turns into a pile of ashes, and later a lamb's face transforms into Basavriuk's.

ANSWER: **"St. John's Eve"** [or **"Vecher nakanune Ivana Kupala"**]

[10] This Ukrainian author of "St. John's Eve" is perhaps better known for *The Overcoat*, and a work in which Chichikov buys the rights to deceased serfs in order to mortgage them, *Dead Souls*.

ANSWER: Nikolai Vasilievich **Gogol**

[10] "St. John's Eve" is part of this collection of short stories that also includes "A Bewitched Place," "The Lost Letter," and "Christmas Eve."

ANSWER: **Evenings on a Farm Near Dikanka** [or **Vechera na khutore bliz Dikan'ki**]

17. One of the first five men of this group, Maudgalyayana, was stoned to death because he murdered his parents in a previous life. For 10 points each:

[10] Identify this term that not only refers to the ascetics who followed the teachings of Gautama, but also to any follower of his teachings.

ANSWER: **sangha** or **samgha**

[10] The *sangha* is one of the three jewels of this religion, whose founder is Siddhartha Gautama.

ANSWER: **Buddhism**

[10] Gautama also revealed this concept to his followers, which is simply the law that regulates the universe. The Buddha illustrates its principles with a "wheel of becoming."

ANSWER: **dharmā**

18. Name some rivers in Russia with a certain group of people living near them. For 10 points each:

[10] Known to the Greeks as part of the Amber Road, this river that flows past Smolensk has Zaporozhian Cossacks on its lower part. Prypiat and Irpin are two tributaries of this river.

ANSWER: Dnieper River

[10] There is a large settlement of Cossacks by this river that has the city Rostov on it and that flows into the Sea of Azov. Sholokhov wrote a book titled *And Quiet Flows* this river.

ANSWER: Don River

[10] Yermak Timofeyevich was part of the Cossacks living along this river that is the longest in Europe. It also flows past Moscow and Repin did a painting of barge haulers on this river.

ANSWER: Volga River

19. Answer the following about being a Russian peasant. For 10 points each:

[10] Russian peasants were given freedom after this liberator tsar signed the Emancipation Act of 1861 that abolished serfdom.

ANSWER: Alexander II [prompt on “Alexander”]

[10] This system of peasant self-governance that dealt with land redistribution and judicial matters was the main organization of the serfs. Haxthausen wrote a famous study in praise of it as preventing revolution while Herzen thought of it as a socialist blueprint.

ANSWER: Obshchina or Mir

[10] Nicolai Milyutin, one of the drafters of the Emancipation Act, was also responsible for the construction of these local councils that managed government affairs for each region, which curbed the power of the nobility.

ANSWER: zemstvos

20. Developed by John von Neumann, this algorithm works by taking an array and recursing on its two halves until there is only one element left. Then the namesake operation is called onto each of its sublists. For 10 points each:

[10] Identify this sorting algorithm that is typically less efficient than quicksort.

ANSWER: merge sort

[10] Merge sort’s average case runtime is that of this function of  $n$ . This function of  $n$  is the quickest possible lowest bound for any comparison-based sort.

ANSWER:  $n \log n$  [pronounced “ $n$  (times) log (of)  $n$ ”; accept  $\log n n$ , which is pronounced “log (of)  $n$  (times)  $n$ ”]

[10] Merge sort’s runtime is a recurrence relation that is one of the three proscribed by this theorem, which automatically provides a closed-form solution to a recurrence relation.

ANSWER: master theorem

Extras

21. A book filled with sheets of music lies at the bottom left of this painting, and its central figure holds several arrows in his right hand. For 10 points each:

[10] Name this work that depicts a red-cheeked youth with darkened wings. His legs are open and lean on a table.

ANSWER: Amor Vincit Omnia [accept Love Conquers All; Amor Victorious; Victorious Cupid; Love Triumphant; Love Victorious; or Earthly Love]

[10] *Amor Vincit Omnia* is by this baroque painter, who also painted a *Supper at Emmaus*. He depicted Mary clothed in red lying on a bed, while others mourn, in his *Death of the Virgin*.

ANSWER: Michelangelo Merisi da Caravaggio

[10] In Caravaggio’s depiction of this scene, the title figure, who is dressed in red, lies on his back after being temporarily blinded.

ANSWER: Conversion of St. Paul [accept word forms; accept Saul in place of Paul]