

Minnesota Open V

Packet by Marshall Steinbaum, Sam Bailey, Matt Menard, and Douglas Graebner

Edited by Auroni Gupta, Andrew Hart, Gaurav Kandlikar, and Cody Voight

Tossups

- 1. This value is given as the difference between “bliss” and actual utility all over marginal utility of consumption in a “mathematical theory” of it developed by Frank Ramsey. David Laibson used a hyperbolic discounting model to argue that liquid financial instruments explain why this value is so low in the U.S. The golden-rule level of this quantity is where steady-state consumption is maximized, though this value does not affect the (*) long-run growth rate in the Solow model. One of the schedules of the model developed in “Mr. Keynes and the Classics” is the set of possible interest rates and national outputs where this value equals investment. For 10 points, name this “S” of the IS/LM model, the difference between income and present consumption.**
ANSWER: savings
- 2. One of these compounds has been used by Li et al. as an catholyte with Li₂SO₄ in dual electrolyte Li-air cells with high stability. These compounds are only weakly modeled by the Stewart formulation in clinical physiology. The composition of these compounds at equilibrium is predicted by the Bjerrum plot. An enzyme that contains a zinc atom at its active site converts carbon (*) dioxide into one of these compounds, and that compound modulates the binding of oxygen in the bloodstream in the Bohr effect. The applicability of the Henderson-Hasselbach equation to these compounds is dependent on the difference between their consecutive pKa values. Titration curves for these curves have multiple equivalence points. For 10 points, name these compounds, like H₂SO₄, in which each molecule gives up multiple hydronium ions when dissociated.**
ANSWER: polyprotic acids [or polybasic compounds, or diprotic acids; prompt on acids]
- 3. One merchant from this place acquired his nickname either from the sound his guns made or from his nervous twitch. Tippu Tib sought to seize land for this place’s leader, Barghash, bringing him into competition with Leopold II. Mwana wa Mwana was exiled from this place and asked for help from Saif ibn Sultan, who pushed the Portuguese out of it. Sa’id ibn Sultan introduced a cash crop to this place after moving a government from (*) Muscat to this place in 1840. The British chose friendly sultans to lead this place until the sultanate’s overthrow by John Okello’s Afro-Shirazi Party. This clove-producing place fought a thirty-eight-minute war with Britain. For 10 points, name this East African island that united with Tanganyika both in place and portmanteau to form Tanzania in 1964.**
ANSWER: Zanzibar [or Unguja]
- 4. One director from this country passed a camera along a zipline to track a street protest incited by the death of Enrique, who wimps out on sniping a bald dictator. The same director from this country produced a movie in which Mark is always rejected by Veronika, who awaits letters from her dead soldier boyfriend. The director of the the 1958 Palme d’Or-winning *The Cranes are Flying* was from this country. Another director from this country depicted twenty-four hours in the life of a city by zooming rapidly between images, such as one of a (*) cameraman trying to set up the best shot. Another movie from this country, the setting of *The Man with a Movie Camera*, contains a shot of a bloodied nurse with broken glasses and a carriage tumbling down several steps, and depicts a 1905 mutiny caused by maggot-infested meat being fed to sailors. For 10 points, name this home of Michael Kalatozov, Dziga Vertov, and the director of *The Battleship Potemkin*, Sergei Eisenstein.**
ANSWER: USSR [or Soviet Union; or Union of Soviet Socialist Republics; or Soyuz Sovetskikh Sotsialisticheskikh Respublik; prompt on Russia]
- 5. This person, with Martin Davis, names an algorithm for testing the validity of a formula in propositional logic using the satisfiability of the ground instances of its negation. Because the state of mathematical knowledge changes according to a version of the scientific process, which is necessarily contingent, this person argued that mathematics is “quasi-empirical.” This person’s support of the externalist stance led him to argue that the thoughts we have in brains are different insofar as they associate different meanings with the (*) same words due to diverse experiences, and thus that what goes on in brains is not reducible to nervous-system inputs. To demonstrate that point, this thinker posited two observationally equivalent but chemically distinct versions of water. For 10 points, name this author of *The Meaning of Meaning* who proposed the Twin Earth thought experiment.**
ANSWER: Hilary [Whitehall] Putnam

6. **In this election, Samuel Pomeroy issued a circular supporting the Secretary of the Treasury as a candidate. The incumbent had his cabinet sign the “blind memorandum” in the event that he lost this election, during which Wendell Phillips supported a party that withdrew its candidate after the removal of postmaster general Montgomery Blair. The Radical Democratic Party arose during this election, during which the word (*) “miscegenation” was coined in campaign literature. Clement Vallandigham was on the Democratic platform committee in this election, during which the winning candidate dropped Hannibal Hamlin as his running mate and chose Andrew Johnson instead. For 10 points, name this election in which George McClellan was defeated by the incumbent, Abraham Lincoln.**
ANSWER: 1864 presidential election [prompt on ‘64]
7. **In reference to these materials, the extended Brinkman-Rice picture was introduced. A Bose-Einstein condensate in a 3D optical lattice undergoes a transition from superfluid to this state as the potential depth of the lattice is increased. One subtype of these materials is a result of a thermodynamic phase transition in which the pre-formed local magnetic moments antiferromagnetically order. One model that successfully explains their existence includes a kinetic energy term and a namesake *U* parameter. The (*) Hubbard model describes these materials, which constitute the second category of a set of materials whose first category includes band, Peierls, and Anderson types, making them a result of a cooperative many-electron phenomenon. They are characterized by an electron-electron interaction much larger than the hopping term. For 10 points, name these materials that are predicted, by band theory, to be conductors, but are actually insulators.**
ANSWER: Mott insulators [accept just Mott after “insulators”; prompt on Mott or insulators or Mott transition metal-insulator transition at any point]
8. **One form of this practice fell out of favor after a treatise by Maimonides argued against Ezra’s proclamation that this practice must be done to end *Keri*. One form of this practice, which requires passing an object between the hands several times in a practice called *negel vasser*, ends with the *Asher yatzar* prayer. Traditionally, hair may not be braided during another form of this practice, which must be done in order to end a time known as (*) *niddah*. Converts to Judaism must undergo a form of this practice that encompasses the whole body within a *mikvah*. For 10 points, name this ritual practice in Judaism that takes two forms: *tevilah*, which involves the whole body, and *netilat yadayim*, which involves just the hands, both of which require the use of water.**
ANSWER: ritual [hand] washing in water [or ritual bathing; or ablution; or immersion in water; accept equivalents of any of the preceding terms; or tevilah before read; or netilat yadayim before read; do not accept “baptism”]
9. **One of these works shows people climbing up a thirty-runged ladder toward a small slit in the top right. Likeness that are “Semitic” and “Zeus-like” dominate one class of these works, another class of which are “not made by hand.” Like Egyptian mummy paintings, works of this type were often executed using heated beeswax pigment in the encaustic technique. One of these works depicts the “Hospitality of Abraham” to three angels that appear sitting around a table at Mamre. In addition to the (*) *Old Testament Trinity*, many of these works show a book in the left hand and two raised of the right hand of Christ, shown as pantokrator. For 10 points, Andrei Rublev was a master creator of what Eastern Orthodox religious paintings?**
ANSWER: Greek and Russian or Eastern Orthodox icons [prompt equivalents of religious paintings or Christian paintings]
10. **In one of this author’s poems, a birthmark that was “shaped for luck” allows the wife of a serial killer to identify their son, who returns to his parents’ tavern and is mistaken for one of their targets. Another poem by this person imagines hearing history dripping “in darkness like the leaking pipe in a cellar.” One of this writer’s characters gains popularity after a fire-escape collapse kills three schoolchildren. This person wrote a folk-ballad about Billie Potts and used soaring hawk imagery in the poems “The Heart of Autumn,” (*) “Mortal Limit,” and “Evening Hawk,” collected in *Promises and Now and Then*. This author repudiated “The Briar Patch,” his pro-segregationist contribution to the Southern manifesto *I’ll Take My Stand*. The narrator of one of this writer’s novels learns that his real father is not “the Scholarly Attorney,” theorizes “The Great Twitch,” and researches his ancestor Cass Mastern. For 10 points, name this author who wrote about Jack Burden in *All the King’s Men*.**
ANSWER: Robert Penn Warren
11. **This ruler arranged the marriage of Galeazzo-Maria Sforza and Bona of Savoy and used a combination of feting the English army and bribery to prevent Edward IV from warring against him. During this ruler’s reign, Johann Heynlin introduced printing to the kingdom. A meeting at Peronne forced this ruler to help a future opponent suppress Liege. This ruler’s reign was chronicled by Phillip de Comynes. The Peace of Acenis helped end a revolt against this ruler, who was defeated by the Constable de Richemont as (*) dauphin in Poitou during the Praguerie. This ruler, who revolted against Charles VII, was opposed by a Duke of Burgundy named Robert the Bold and the League of the Public Weal. For 10 points, name this long-reigning French king of the mid-1400s nicknamed for his prudence.**
ANSWER: Louis XI [accept Louis paired with any of the following: the Universal Spider; l’universelle Aragne; the Prudent; the Cunning; or le Ruse; prompt on Louis]

12. **One way to do this action now comes in GS FLX+ (“flex-plus”) and GS junior varieties. Another technique for doing this action, developed in 2012, carries out its objective by using a CMOS semiconductor and is called the PGM. Unlike most other systems, the HeliScope and SMRT (“smart”) ways to do this action can be conducted on single macromolecules. Applied Biosystems’ SOLiD platform performs this action. Another way to do this action is carried out on (*) picotiter plates and requires the addition of ATP sulfurylase to the reaction. That technique for accomplishing this action is based on the conversion of luciferin to oxyluciferin after an ATP is cleaved to AMP during dNTP incorporation. This action is performed by the Illumina platform and a platform developed by 454 based on the release of pyrophosphate. For 10 points, name this action that the Human Genome Project did a whole lot of using the “shotgun” method.**
ANSWER: DNA **sequencing** [accept word forms; accept more specific answers like **high throughput sequencing** or **next generation sequencing**]
13. **One math-professor-turned-member of this movement wrote a pastiche of the English detective novel genre with his Hortense trilogy and penned the prose masterpiece *The Great Fire of London*. Another author from this movement wrote a story whose narrator sees an argument on the S bus, then hears one of the arguers get told that he’s missing a button, a story repeated 98 more times in the collection *Exercises in Style*. That author, a member of this movement, wrote about a girl who escapes the watchful eye of her gay Uncle Gabriel to explore Paris in a novel adapted into a 1960 film. Another novelist from this movement wrote about the creation, assembly, and erasure of 500 jigsaw-puzzle seascapes by Bartlebooth and went 300 pages without using the (*) letter “e” in his novel *A Void*. For 10 points, the works *Zazie in the Metro* and *Life: A User’s Manual*, by Raymond Queneau and Georges Perec, are from what whacky French literary movement?**
ANSWER: **Oulipo** [or **Ouvroir de littérature potentielle**; or **workshop of potential literature**; for middle clues’ sake, I didn’t include this as a clue but check it out because it’s mad cool: http://www.bevrowe.info/Queneau/QueneauRandom_v4.html]
14. **A restaurant in this district is the setting of a painting in which a girl in a blue-and-white striped dress sits the wrong way on a park bench in front of a dancing crowd. An art museum in this district is the former house of a painter born there, Maurice Utrillo. The highest point in this district is accessible from over 300 steps or a namesake funicular railway. In the late 1800s, the first modern cabaret, with a poster designed by Theophile Steinlen, opened in this district. In the wake of the Paris Commune, a massive (*) domed basilica was constructed at the highest point of this district, which was where Le Moulin de la Galette and Le Chat Noir were located. Directly to the southwest of this district, is the red-light district of Pigalle, the home of the Moulin Rouge. For 10 points, the Sacre-Coeur Basilica sits atop what hill in the north of Paris that names a surrounding arts district and takes its name from the Frenchified form of “Hill of Mars”?**
ANSWER: **Montmartre**
15. **A performer, in a 1999 performance of a piece of this kind, mimicked the pan flute with his instrument in his version of the final “Appassionata” movement, which encourages performers to use their own cadenzas. Besides that piece by Ligeti, another work of this kind had its original slow movement shuttled out and incorporated into its composer’s *Souvenir d’un lieu cher*, and replaced with the “Canzonetta,” which transitions directly into the finale without breaks. That work of this kind was unfortunately described by Eduard Hanslick as a (*) “stink one can hear.” Another work of this kind opens with four soft timpani taps and holds the record among works of this kind for time elapsed before the soloist gets to play. Eduard Lalo’s *Symphonie espagnole* is considered a work of this kind, which Tchaikovsky, Beethoven, and Brahms all wrote in D major, the latter dedicating his effort in this form to Joseph Joachim. For 10 points, name these concerti with a solo string instrument.**
ANSWER: **violin concerto** [prompt on **concerto** until mentioned; or **violin concerti**]
16. **Gregor Nitzsch opposed F.A. Wolf’s postulation that this author weaved together source material. This writer’s works were compared to “The Wedding of Smilaglic Meho,” a Serbo-Croatian ballad, by Alfred Lord. The ominous narrative of Abraham’s sacrifice of Isaac is contrasted with this writer’s calmer description of the recognition of a scar in the first chapter of Auerbach’s *Mimesis*. A king leaving the passenger on his back to drown sparks the title acrimonious conflict between the title (*) animals in one work attributed to this author. Millman Parry connected this writer’s use of formulaic phrases like “rosy-fingered dawn” to his theory that this man might have dictated his most famous works. Another work by this possible author of the *Battle of the Frogs and the Mice* opens with the word “rage” and includes a “Catalogue of Ships.” The first major English translation of this blind poet was by George Chapman. For 10 points, name this author of the *Iliad* and the *Odyssey*.**
ANSWER: **Homer**
17. **This institution eventually took the Sanhedrin as its model under the influence of the Fifth Monarchists. The measure that gave this institution its name was a constitutional violation intended to force the king to sign the treason attainder passed against his own Privy Councillor, Lord Strafford, who had plotted an invasion from Ireland to collect ship money without this institution’s consent. This institution’s anti-episcopal stance was motivated by the policies of Archbishop (*) Laud, including the introduction of the *Book of Common Prayer* in Scotland, which was opposed by the Covenanters. This institution was dominated by the officers’ council of the New Model Army. For 10 points, name this parliament that overthrew and executed Charles I before ceding practical power to Oliver Cromwell.**
ANSWER: the **Long Parliament** [or **Parliament of 1640**; prompt on **Parliament**]

18. **The foundation for many of this thinker's ideas came from his studies of organisms in the genera *Cerion* and *Poecilozonites*. This thinker wrote of one character that "the former twerker of pig's nipples [got] a kick in the ass for insubordination" as his eyes gradually grew in "A Biological Homage to Mickey Mouse." The second part of this thinker's most influential book is titled "Heterochrony and Paedomorphosis" and includes a chapter titled (*) "Progenesis and Neotony." That work by this thinker is about Haeckle's discredited idea that ontogeny recapitulates phylogeny. One of this thinker's works is named for a structure that is actually the extension of the radial sesamoid. For 10 points, name this paleontologist whose essay collections include *The Panda's Thumb*, and who developed the theory of punctuated equilibrium with Niles Eldredge.**

ANSWER: Stephen Jay **Gould**

19. **A 2003 paper by Courtillot, a well-known researcher of these features, et al. proposed five characteristics to distinguish one type of them. True polar wander is calculated using these features as a reference frame. Products of these features have a much higher helium-3 to helium-4 ratio than MORBs. Evidence of the Great Meteor one can be found on North America. The origin of these features was first satisfactorily explained by W. Jason Morgan and they were first proposed by J. Tuzo (*) Wilson. Analysis of their "tracks" or "trace" constrains the direction and magnitude of plate movement for approximately the past 200 million years. One of the final steps in the evolution of products of these features is an atoll. These features are likely formed by mantle plumes. For 10 points, name these geologic features responsible for the creation of volcanic island chains, like the Hawaiian Islands.**

ANSWER: **hotspots** [or mantle **plumes** before mention; prompt on **seamount** before "J. Tuzo Wilson" is read]

20. **This character's corpse had its genitals, ears, and nose cut out and strung under its armpits to prevent his ghost from haunting his killer in a fragmentary Sophocles tragedy. This character's head is whirled around by its hair and tossed as an insult by his killer, who lusted after him as soon as he saw him fetch water for his horses at a spring and killed him on the altar of a shrine at Apollo Timbraeus. After seeing a set of armor with a brooch pinned to it, this character realizes that he was betrayed by his lover, who promised to return to him in (*) ten days when she was forced to be exchanged for a Greek prisoner at the behest of her father Calchas. This character's love interest was changed from Briseis in *The Iliad* to a woman whose messages with him were ferried by his friend Pandarus. This man, who is killed by Achilles, is the romantic rival of Diomedes. For 10 points, name this Trojan who, in works by Chaucer and Shakespeare, remained faithful to Cressida.**

ANSWER: **Troilus** [or **Troilos**]

21. **Near the end of this novel, a character has a vision of thousands of vultures picking a village full of corpses clean and then immediately goes to Sebastiana's quarters and rapes her. Several characters in this novel perform a communion service with the excrement of their dying leader, who was born and apprenticed to rival shoemakers and wore a memorable dark purple tunic. A red-haired Scottish phrenologist is hired to smuggle weapons by Epaminondas Goncalves, leader of the Progressivist Republicans, in this novel. Jurema and The Dwarf keep a nearsighted journalist alive as the community around them is destroyed and the Little (*) Blessed One gathers thousands of wretched followers with his apocalyptic prophecies in this book, which concerns the same subject matter as *Rebellion in the Backlands*, but is more sympathetic to Antonio Conselheiro. For 10 points, name this novel about the Canudos uprising in Brazil, written by Mario Vargas Llosa.**

ANSWER: *The War of the End of the World* [or *La Guerra del Fin del Mundo*]

Tiebreakers

22. **Objects made by this civilization have been found to be "name-tagged" with glyphs. The murals at San Bartolo were executed by this civilization, whose rulers would offer blood to the gods using thorns. After this civilization was conquered, one of their subdivisions survived another century on Lake Taysal. The Izapan culture was a major predecessor to this civilization, which was not conquered by the Spanish until 1541 by Pedro de (*) Alvarado. This civilization, which believed cenotes to be sacred, had as one leader First Step Shark, who founded the city of Tikal. Yunknoom The Great catapulted this people's city of Calakmul to greatness. For 10 points, name this ethnic group whose ruler Pakal the Great presided at Palenque.**

ANSWER: **Maya** civilization [or **Mayans**; prompt on **Quiche**]

23. **One character in this work recalls hearing another recite a genealogy in which "Neckwus begat Fleckwus, King of Spit. And Fleckwus spoke out of his chinkle-chankle!" Another character in this work dreams that he ritually removes the entrails from children as a priest in Homeric Greece. The court magistrate Hesther Salomon is a minor character in this play, whose central character cries out "Ek!" at night and initially exclusively speaks in advertising jingles. Its protagonist sees his father Frank during a date at an adult (*) movie theater and later interrupts his lovemaking with Jill Mason in a barn. This play's main character admits wanting to remove the bit from several creatures belonging to Harry Dalton, symbolically freeing them from enslavement. The main character of this play secretly rides Nugget while naked. For 10 points, name this play about the psychiatrist Martin Dysart and his patient Alan Strang, a Peter Schaffer work inspired by the real-life blinding of horses.**

ANSWER: **Equus**

24. **An approximation algorithm with ratio 2 that is used to solve the k-center problem is termed the “parametric” form of this technique. Chess programs can use a null-move heuristic and the futility version of this technique to reduce the effective branching factor. In neural networks, two major classes of algorithms named for this technique are sensitivity-calculation methods and penalty-term methods. Beam search is a typical example of the forward version of this technique. The best-known algorithm for this technique stores a maximum value for a max node’s descendants and a minimum value for a min node’s descendants in its two namesake parameters. That algorithm is usually combined with (*) minimax and is the alpha-beta type of this technique. For 10 points, name this technique that removes extraneous parts of decision trees and takes its name from horticulture.**

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

Minnesota Open V

Packet by Marshall Steinbaum, Sam Bailey, Matt Menard, and Douglas Graebner

Edited by Auroni Gupta, Andrew Hart, Gaurav Kandlikar, and Cody Voight

Bonuses

1. Manuel Arellano painted the first type of these works, and Miguel produced a series that began with “mestizo” and ended with “heathen Indians.” For 10 points each:
[10] Name these paintings, which usually depict sixteen different combination of races in colonial Latin America.
ANSWER: **Casta** Paintings [or Pinturas de **castas**; or Cuadros de **castas**; or **caste** paintings]
[10] This caste accumulated regional power in the colonies until the Bourbon reforms returned most government posts to peninsulares. Like the peninsulares, these people had two white parents, but unlike peninsulares, they were born in the colonies.
ANSWER: **criollos** [or **creoles**]
[10] The legal relationship between Spaniards and Indians was first laid out in the 1512 Laws of Burgos, which also established this legal system, which provided each colonist with Indian slaves to convert and teach Spanish.
ANSWER: **encomienda**
2. The speaker of this poem explains that “as the heart grows older / It will come to such sights colder,” advising its addressee to “by and by, nor spare a sigh.” For 10 points each:
[10] Name this poem that begins by asking “Margaret, are you grieving / Over Goldengrove unleaving?” It discusses a young child’s sorrow at the contrast between the two title times of year.
ANSWER: “**Spring and Fall**, to a Young Child”
[10] This Jesuit priest wrote “Spring and Fall” and used sprung rhythm in his poems “The Windhover,” “Pied Beauty,” and “God’s Grandeur.”
ANSWER: Gerard Manley **Hopkins**
[10] In “Spring and Fall,” Hopkins appended “meal” to this word to describe the way in which “worlds of wanwood” lie. In a Robert Frost poem, these things “subside” to themselves, causing Eden to “[sink] to grief.”
ANSWER: **leaf** [or word forms; accept **leafmeal**]
3. In prokaryotes, SecA can help guide peptides through this structure, which is thought to be plugged until the SRP is displaced so that a tight seal is created between this structure and its associated ribosome. For 10 points each:
[10] Name this donut-shaped structure that allows for the movement of peptides from the cytosol into the endoplasmic reticulum.
ANSWER: ER **translocon** [accept **Sec61**; prompt on ER **translocator**]
[10] Because the ER has an oxidizing environment, PDI can act on proteins to form these structures. These structures form between the thiol groups of cysteine residues, and are considered to be part of a protein’s primary structure.
ANSWER: **disulfide** bonds/bridges/crosslinks
[10] Proteins that are misfolded in the ER are exported back out to the cytosol and are tagged with multiple copies of this highly conserved peptide. Proteins tagged with chains of this peptide are targeted to the proteasome.
ANSWER: **ubiquitin** [accept poly**ubiquitin**ilation or other word forms]
4. One couple from this city is notable for “typologies,” photographic arrays of architectural variants on the same industrial subject, such as water towers and coal mines. For 10 points each:
[10] Name this German city, the home of the photography power couple Bernd and Hilla Becher, whose contemporary art scene also includes a man who created photorealist works like his *Baader-Meinhof Gang* series and his *Nazi Uncle Rudi*.
ANSWER: **Dusseldorf**
[10] This contemporary German of the aforementioned *Baader-Meinhof* series is a big deal in Dusseldorf right now.
ANSWER: Gerhard **Richter**
[10] The Dusseldorf Academy, which produced Gerhard Richter and the Bechers as students, was known as an international hotspot for this “plein air” style of this painting genre in the 1850s, which influenced the Hudson River School of this genre.
ANSWER: **landscapes**

5. For 10 points each, name some things about important libraries in modern European history.
 [10] This early antiquarian library, named for a certain Sir Robert and housed in Ashburnham House, held the only extant manuscripts of *Beowulf*, which is known as this library's namesake "Vitellius A-fifteen" volume.
 ANSWER: **Cotton** Library [or **Cottonian** library]
 [10] This library in London absorbed the Cotton Library and still uses Cotton's Roman Emperor-based shelfmarks. It used to be housed in a similarly named museum's Round Reading Room.
 ANSWER: the **British Library** [accept **British Museum**]
 [10] This king of Hungary hired Verocchio and founded one of the great libraries of Renaissance Europe, a major center for classical learning. This son of John Hunyadi was nicknamed "The Raven."
 ANSWER: **Matthias Corvinus** [or **Matthias I**; or **Matyas I**; or **Hunyadai Matyas**; accept also **Corvinian** Library or Biblioteca **Corviniana**; prompt on **Matthias** or **Matyas**]
6. Like all other quantum field theories, a non-perturbative approach to solving this one is prefixed by "lattice." For 10 points each:
 [10] Name this theory of the strong interaction in which quarks have a color charge.
 ANSWER: **quantum chromodynamics** [or **QCD**]
 [10] QCD predicts that the up and down quarks have small masses, implying this symmetry. Since it has not been observed, it must be spontaneously broken.
 ANSWER: **chiral** symmetry [prompt on **invariance** under the **parity** transformation, or word forms thereof]
 [10] QCD predicts this phenomenon, in which the coupling strength of gluons decreases with increasing energy and momentum. It can be alternately stated as "hard gluons couple weakly, but soft gluons couple strongly."
 ANSWER: **asymptotic freedom**
7. The "Beast from the sea" is shown rising up from between this figure's legs in one painting, and this figure is also the subject of the painting "The Number of the Beast is 666." For 10 points each:
 [10] Name this figure with enormous wings and many heads that is shown with a woman being "Cloaked in the sun" in one entry of a series of paintings based on *Revelation* 12.
 ANSWER: The Great **Red Dragon**
 [10] The *Great Red Dragon* series was by this painter who also made many depictions Urizen doing things like kneeling at an altar before the Demiurge. He also created a series of engravings that illustrated the *Book of Job* and his own *Songs of Experience*.
 ANSWER: William **Blake**
 [10] This tiny Blake work shows the title creature, which has a tiny head atop a huge neck, walking across what may be the stage of a theater. Its title creature is sticking its tongue out toward a big bowl that is presumably holding blood.
 ANSWER: *The* **Ghost of a Flea**
8. Grizzly Bear produced this singer's critically acclaimed first album, *Forget*. For 10 points each:
 [10] Name, or give the stage name of, this artist behind the 2012 album *Confess*, which contains a song that opens "I'll stick to your heart / straight to your heart / I can't get to your heart," his "Five Seconds."
 ANSWER: **Twin Shadow** [or George **Lewis** Jr.]
 [10] The music video for "Five Seconds" focuses on Georgie, a member of a futuristic gang of this type. The Shangri-Las classic "Leader of the Pack" is about Jimmy, the head of one of these gangs.
 ANSWER: **motorcycle** gangs [or **biker** gangs; accept equivalents]
 [10] This FX-network drama follows biker-gang leader Jax Teller and his SAMCRO-gang buddies.
 ANSWER: **Sons of Anarchy**
9. Name some places that someone from Chicago went the weekend that he wrote this, for 10 points each. Oh, and even if it isn't, let's pretend that that person is Marshall Steinbaum.
 [10] Marshall reports that this town, which changed hands eight times during the Civil War, "is very lovely and has some nice hiking" near the mouth of the Shenandoah river.
 ANSWER: **Harpers Ferry**
 [10] In case you were wondering, Marshall reports that the U.S. 301 bridge over this river at Sandy Hook "has some fantastic smallmouth water." It flows through Washington D.C.
 ANSWER: **Potomac** River
 [10] This canal, sometimes called the "Grand Old Ditch," used to follow the Potomac. Its now mostly dry bed is a national historic park. Marshall has no reported opinions about it.
 ANSWER: **Chesapeake and Ohio** Canal [or **C&O** canal]

10. The narrator of this story notices a large number of converts to Islam among the French populace and accuses a Bean Street barber and his midwife of being the mastermind of an Islamic plot to take over the world. For 10 points each;
 [10] Name this story whose narrator Poprischin, in an entry titled “April 43rd, 2000,” triumphantly announces that he is the King of Spain.
 ANSWER: “**Diary of a Madman**” [or “**Zapiski sumasshedshego**”; or “**Memoirs of a Madman**”]
 [10] “Diary of a Madman” is a farcical story by this Ukrainian author, whose other works of short fiction include “The Nose” and “The Overcoat.”
 ANSWER: Nikolai [Vasilievich] **Gogol**
 [10] In this horror story by Gogol, the prime literary influence for Mussorgsky’s *Night on Bald Mountain*, the worker Petro murders his boss’s son Ivas in order to obtain some gold to marry his beloved Pidorka. But despite his happy marriage, this story’s protagonist is haunted by the guilt of his crime and gets carried away by the Devil.
 ANSWER: “**St. John’s Eve**” [or “**Vecher nakanune Ivana Kupala**”; or close translations like “On the **Eve of John**”]
11. This book portrays human existence as a perpetual conflict between hedonism and duty. For 10 points each:
 [10] Name this work in which the hedonist position is associated with a constant need for variety and sensory stimulation, exemplified by “crop rotation,” and the ethical life requires self-abnegation and God consciousness.
 ANSWER: **Either/Or** [or **Enten-Eller**]
 [10] This 1849 Soren Kierkegaard work puts forward a theory of the title concept, which Kierkegaard equates with despair and is the opposite of faith, arises when a finite self is not conscious of its alignment with an infinite God.
 ANSWER: *The **Sickness Unto Death*** [or **Sygdommen til Doden**]
 [10] This work takes issue with Kierkegaard’s presentation of the “radical choice” in *Either/Or*, since that work has no justification for choosing the ethical life other than associating it with God, as opposed to the teleological, medieval view of this work’s title concept favored by its British author.
 ANSWER: **After Virtue** [by Alisdair MacIntyre]
12. This man achieved high office after helping to depose the unwilling pretender Hypatius from the imperial box during the Nika Revolt. For 10 points each:
 [10] Name this eunuch general under Justinian who secured the Gothic treasury Totila had stored at Cumae and defeated the Goths at Taginae and Mons Lactarius as part of the reconquest of Italy.
 ANSWER: **Narses** [or **Nerses**]
 [10] Narses participated in the plot to overthrow this frustratingly honest and notoriously thorough tax collector, who operated on Justinian’s behalf to great effect until Theodora plotted to have him exiled in 541.
 ANSWER: **John the Cappadocian** [prompt on partial answer; or **Iohannis Orientalis**]
 [10] Under John the Cappadocian’s influence, Justinian concluded the Eternal Peace of 532 with this ruler. The peace enabled this ruler to secure his domestic position against the Mazdakites, though he was eventually induced to abandon it by Gothic envoys in 540 CE.
 ANSWER: **Khosrau I** [or **Chosroes I**; prompt on **Khosrau** or **Chosroes**]
13. The set of critical values of a smooth map between two of these objects always has measure zero in the receiving space, according to Sard’s theorem. For 10 points each:
 [10] Name these higher-dimensional analogues of smooth curves and surfaces that locally look like a Euclidean space and that have a Riemannian type.
 ANSWER: **manifolds**
 [10] Two manifolds are topologically the same if there is this kind of mapping between them. It is a bijection, continuous in both directions, that preserves topological properties.
 ANSWER: **homeomorphism** [or **topological isomorphism**; or **bicontinuous function**]
 [10] This theorem states that every manifold of dimension n can be smoothly embedded in the Euclidean space of dimension $2n$. It is considered the “grandfather of all embedding theorems.”
 ANSWER: **Whitney** embedding theorem

14. This character and Gawain are responsible for rescuing Guinevere from Maleagant, the son of King Bagdemagus, in a Chretien de Troyes work. For 10 points each:
 [10] Name this Knight of the Cart whose affair with Guinevere features prominently in Malory's *Le Morte de Arthur*.
 ANSWER: Sir **Lancelot** du Lac
 [10] Lancelot rescued this daughter of King Pellles from a boiling bath at the Castle of Corbin and was tricked into sleeping with her, producing Galahad from their union. Weirdly, Lancelot's mother also has this name.
 ANSWER: **Elaine** of Corbenic [or **Elaine** of Benoit]
 [10] In *The Knight of the Cart*, Lancelot sleeps with Guinevere one night but unwittingly does this in her room, causing Kay to do this in his room via some supernatural synchronicity. Upon seeing the aftermath of this action in both rooms, Maleagant cluelessly accuses Kay of having slept with Guinevere.
 ANSWER: **bleeds** on her bed [accept any answer involving shedding **blood**]
15. This document argues that being "forced into a matriarchal structure" has hampered the progress of African Americans in its fourth chapter, "The Tangle of Pathology." For 10 points each:
 [10] Name this 1965 report on black poverty prepared by the assistant Secretary of Labor that recommended "enhancing the stability and resources" of the family to alleviate poverty.
 ANSWER: **Moynihhan** Report [or "The **Negro Family**: The Case for National Action"]
 [10] The Moynihhan Report was part of a larger Lyndon Johnson program that tried to "pursue victory over the most ancient of mankind's enemies" by declaring a "war" on this concept.
 ANSWER: War on **Poverty**
 [10] Another influential text for the War on Poverty was this 1962 work by Michael Harrington. Dwight Macdonald's review of this work inspired John F. Kennedy to ask his Council of Economic Advisers to prepare an economic report on poverty, which became the foundation for later social programs.
 ANSWER: *The **Other America**: Poverty in the United States*
16. This figure's concealment can be divided into "minor" and "major" occultation. For 10 points each:
 [10] Name this Messiah-like figure, who will emerge from hiding according to some Shia beliefs.
 ANSWER: the **Mahdi**
 [10] This largest branch of Shia Islam, named for the number of imams that it accepts, holds that the Madhi will actually emerge.
 ANSWER: **Twelver** Shia [prompt on **Imami** Shia; or **Athna'ashariyyah**]
 [10] One controversial Twelver practice is *Nikah mut'ah*, literally the "pleasure" form of this action, under which it is allowed to occur for a fixed, preset period of time.
 ANSWER: **marriage** [accept any word form or equivalent of **marriage** or **wedding**]
17. The second movement of this work is based on incidental music for Schiller's adaptation of Carlo Gozzi's *Turandot*. For 10 points each:
 [10] Name this orchestral work whose music was redone from a ballet planned as a collaboration with Leonide Massine. The source material for this work is a volume of piano duets from the early nineteenth century.
 ANSWER: ***Symphonic Metamorphosis on Themes by Carl Maria von Weber*** [or ***Symphonic Metamorphosis on Themes by Weber***]
 [10] This German-born composer wrote the *Symphonic Metamorphosis on Themes by Weber* in America one year after composing *Ludus Tonalis* and five years after his opera *Mathis der Maler*.
 ANSWER: Paul **Hindemith**
 [10] This solo piano piece by Carl Maria von Weber, orchestrated by Berlioz, opens with thirty-five bars representing a young man and lady preparing to perform the title action.
 ANSWER: ***Invitation to the Dance*** [or ***Aufforderung zum Tanz***]
18. Mahmud of Ghazni was not impressed with this poet's masterwork, which included a dedication to the sultan. For 10 points each:
 [10] Name this poet whose most famous work describes the mythical, heroic, and historical ages. He was apocryphally promised additional payment for every line he wrote.
 ANSWER: Hakim Abu'l-Qasim **Ferdowsi** Tusi
 [10] Ferdowsi related stories of the first man, Keyumers, and the tragedy of Sohrab and his father Rustam in this epic poem.
 ANSWER: ***Shahnameh*** [or ***Shahnama***; or ***Book of Kings***]
 [10] This character from the *Shahnameh* is abandoned on Mount Damavand for being an albino, but is raised by the mythical bird Simurgh, who gives him three feathers to burn to signal her if needed. He is the father of Rustam.
 ANSWER: **Zal**

19. This work uses the analogy of a dance to explain its concept of “networks of interdependencies,” dubbed figurations. For 10 points each:
 [10] Name this two-volume work whose first volume traces the increasingly strict standards of decency with changing social relationships of the modern period, and whose second volume describes how the early-modern state emerged from such standards.
 ANSWER: *The **Civilizing Process*** [or *Über den **Prozess der Zivilisation***] [by Norbert Elias]
 [10] *The Civilizing Process* defines this word as a “second nature” or “blindly functioning apparatus of self-control.” Pierre Bourdieu described this concept as the set of habits and perceptions individuals acquire in interacting with the larger social field.
 ANSWER: **habitus**
 [10] This man discussed manners and standards of bodily control in his essay “The Technique of the Body,” published the same year as *The Civilizing Process*. He examined potlatches and kula rings in his book *The Gift*.
 ANSWER: Marcel **Mauss**
20. This author attempted social criticism with his bifurcated short story “The Paradise of Bachelors and the Tartarus of Maids.” For 10 points each:
 [10] Name this American author who is far better known for using the words “Call me Ishmael” to open his novel about Captain Ahab’s revenge, *Moby-Dick*.
 ANSWER: Herman **Melville**
 [10] Melville pretended to be a “Virginian spending July in Vermont” in a work of literary criticism, published in two installments in the *New York Literary World*, that praised this contemporary author for “dropp[ing] germinous seeds in my soul” with an enjoyable short story collection.
 ANSWER: Nathaniel **Hawthorne** [or Nathaniel **Hathorne**; accept “**Hawthorne and His Mosses**”]
 [10] In the dark ending to this Melville novel, the title heir of a New York manor and the two women who love him, Isabel Banford and Lucy Tartan, share a vial of poison, leaving behind three corpses in the Tombs.
 ANSWER: **Pierre**; or, *The Ambiguities*
21. In estrogen, a series of cyclohexane rings are bonded to one of these compounds, one of which is used in conjunction with chlorine to clean up DNA extracts. For 10 points:
 [10] Name this class of compounds that is characterized by a hydroxyl group bonded to a benzene ring.
 ANSWER: **phenols**
 [10] This class of phenolic compounds activate their namesake G-protein-coupled receptors, which are inhibited by anti-obesity drugs like Rimonobant. These compounds are produced by the species *indica* and *sativa* that both belong a certain genus.
 ANSWER: **cannabinoids** [accept **cannabis**]
 [10] Treating a solution of 1-chloro-2, 4-dinitrobenzene with hydroxide to synthesize a phenol is an example of this type of aromatic substitution in which a group other than hydrogen is displaced from an aromatic ring.
 ANSWER: **ipso** substitutions

Extra bonuses

22. The only work this man published in his lifetime was his *Memoirs of the Royal Navy*, which described his time as Secretary of the Admiralty. For 10 points each:
 [10] Name this man who wrote about the Great Fire of London in the diary he kept from 1660 to ‘69.
 ANSWER: Samuel **Pepys** (“peeps”)
 [10] In 1663, Pepys bought the will of this historical figure. In *Twenty Years After*, D’Artagnan reunites the Three Musketeers in service to this man, the implied lover of Anne of Austria.
 ANSWER: Cardinal Jules **Mazarin** [or Giulio Raimondo **Mazzarino**; or **Mazarini**]
 [10] Among the dozens of plays seen by Pepys is this Roman tragedy by Ben Jonson, which was less successful than *Sejanus His Fall*. The title character calls his nemesis, Cicero, a “boasting, insolent tongue-man.”
 ANSWER: **Catiline His Conspiracy**
23. Harlow Shapley used the anisotropy in the distribution of globular clusters, which are composed of these objects, to determine that the center of the Milky Way is nowhere close to our Solar System. For 10 points each:
 [10] Name these objects that are classified into Populations I, II and III based on increasing age and decreasing metallicity. They are powered by fusion and include the Sun.
 ANSWER: **stars**
 [10] Unlike the globular clusters in the Milky Way, those in this object exhibit a bimodal age distribution. This object contains the Tarantula Nebula, the most active locus of star formation in the Local Group.
 ANSWER: **Large Magellanic Cloud** [or **LMC**]
 [10] This is the largest globular cluster in the Milky Way. A color-magnitude diagram of 50,000 stars in this cluster indicates that its stars formed over a two-billion year period.
 ANSWER: **Omega Centauri**

24. This group's modern-day descendants formed the Moravian Church in the United States. For 10 points each:
- [10] Name this more radical Hussite faction that allowed married priests and abolished all but two sacraments. They opposed the Utraquists.
- ANSWER: **Taborites**
- [10] The Taborite general who won at Grunwald and developed the Hussite's "Wagon fort" tactics, Jan Zizka, had this physical deformity, also shared by the founder of the Antigonid Dynasty, Antigonus Monophthalmus.
- ANSWER: having **one eye** [or **one-eyed**; accept equivalents like **cyclops**]
- [10] Jan Zizka was succeeded by this figure, who turncoated from the Utraquists to the Taborites and invaded Saxony before being killed at the Battle of Lipany.
- ANSWER: **Prokop** the Great [accept **Prokop** Veliky/Holy/Rasus/the Shaven; or Andrew **Procopius**]