



ACADEMIC COMPETITION FEDERATION

2014 ACF NATIONALS
PACKET 4 BY THE EDITORS

TOSSUPS

1. These physical phenomena arise mathematically from the requirement that intersecting characteristics not be allowed, and those of them which do not satisfy the entropy condition are known as the “rarefaction” variety. In one dimension, the appearance of these phenomena is indicated by a discontinuity derived from the Rankine-Hugoniot relations, which combine continuity, momentum conservation, and energy conservation. These phenomena are analogous to hydraulic jumps in gravity-driven flows, where the Froude number changes from supercritical to subcritical values, and the drag induced by these phenomena is independent of viscosity and thermal conductivity. When these phenomena detach from the body around which they form, they propagate in front of it in the form of a curved front and are known as the “bow” variety. For 10 points, identify these disturbances in a continuous medium such as air which can occur when an object moving through the medium exceeds the medium’s Mach number.

ANSWER: SHOCKS [or SHOCK WAVES]

2. This ruler died from an arrow wound he received while trying to quash the rebellion of Ying Bu. Early in his reign, he personally led armies through the snow to Pingcheng in order to fight the Battle of Baideng, but his loss there forced him to agree to the “heqin” agreement, which set up a marriage alliance with Modu Chanyu. He was nearly assassinated during an incident called the Feast at Hong Gate, but he escaped in the middle of the banquet to avoid being attacked by the forces of Xiang Yu. Late in life, he favored Lady Qi as concubine, though she was murdered by his Empress after his death. This ruler, who was originally a supervisor of convicts in Pei County, initiated a four-year war against Xiang called the Chu-Han Contention, after the collapse of the previous dynasty. For 10 points, name this peasant farmer who rose from the ranks of commoner to establish the Han Dynasty in 202 BC.

ANSWER: LIU BANG [or Emperor GAOZU of Han; or LIU PANG; or KAO TSU]

3. One poem in this language was written in response to a Napoleonic decree that banned the living from visiting graves and dictated set distances between cemeteries and inhabited areas. In addition to “On Sepulchres”, Ezra Pound translated another poem from this language that begins, “Who is she coming, drawing all men’s gazes, / who makes the air one trembling clarity”. Another poem in this language describes Love visiting the poet after he has a dream of a figure telling him “Ego dominus tuus” or “I am your Lord.” That poem in this language appears in a work that ends with the speaker resolving to stop writing about his beloved until he can write “of her what has never been said of any woman”, and that work begins with the statement, “In that book which / is my memory / on the first page . . . Appears the words / Here begins a new life.” For 10 points, name this language whose notable poets include Guido Cavalcanti and Dante.

ANSWER: ITALIAN

4. According to Girolamo Cardano’s treatise “On Gaining Advantage from Misfortunes,” we only have hope of this philosophical doctrine, because certainty in this doctrine would lead men into delusions of grandeur. In his most famous work, Pietro Pomponazzi argued that this philosophical doctrine was probably false, and Georg Friedrich Meier’s most famous work argues that the truth of this doctrine is unknowable. This position was advocated for in a work consisting of three dialogues which argued that if this philosophical doctrine was false, then the state had the right to demand that a citizen sacrifice his life for it. That work, whose argument was criticized by Kant on the grounds that its subject was capable of being diminished to nothingness by degrees, was written by Moses Mendelssohn. Another work which advocates for this philosophical doctrine does so through the cyclical argument, the argument from recollection, and the affinity argument. For 10 points, identify this philosophical position advocated by Socrates in the *Phaedo* according to which some immaterial part of us lives forever.

ANSWER: IMMORTALITY of the SOUL [accept reasonable equivalents to “immortality”]

5. Organizers of auditions for this instrument often request excerpts from the third variation of Alberto Ginastera’s *Variaciones Concertantes*. This instrument plays an F-C-F-A “Rossini crescendo” in a difficult solo forming the principal theme of the *Semiramide* overture. Jack Brymer’s book about playing and teaching this instrument was published as one of Yehudi Menuhin’s music guides. This instrument imitates the song of a blackbird in “Liturgy of Crystal,” and later plays eighth notes with an extremely slow tempo in “Abyss of Birds,” in Messiaen’s *Quartet for the End of Time*. In the last decade of his life, Brahms emerged from his retirement and composed a trio, two sonatas, and a quintet for this instrument in rapid succession. A C major coda inspired by a popular Brazilian tune ends a two-movement concerto for this instrument, premiered on an NBC radio broadcast conducted by Fritz Reiner. The B-flat soprano is the most common variety of this single-reed instrument, for which Aaron Copland wrote a concerto. For 10 points, name this woodwind instrument that plays a glissando at the start of *Rhapsody in Blue*.

ANSWER: CLARINET

6. This politician ran a televised ad where he carried a grocery bag up to his home after returning from a shopping trip with his family, and talked about the high cost of living. His maternal grandfather was Jesse Fell, who had been the campaign manager for Abraham Lincoln. In one speech, he stated that “there is a new America every morning when we wake up - it is upon us whether we will it or not,” and in a series of five minute spots, he was known as “The Man from Libertyville.” In a better known speech given to the American Legion, he implored “Let’s talk sense to the American people.” In the last post of his career, he had a heated exchange with Valerian Zorin, when he challenged Zorin at the UN Security Council to admit the existence of missiles in Cuba. This one-time governor of Illinois chose John Sparkman as his running mate in one election, and then Estes Kefauver in another. For 10 points, name this so-called “egghead” who lost twice running for president against Dwight Eisenhower.

ANSWER: Adlai STEVENSON II

7. This novel features a debate about differentiating a woman from a kangaroo, leading one character to ask random people if they know if his wife is a kangaroo. One character inadvertently writes a wildly heretical religious tract titled *Evidences of Christian Religion* because he will only read books with green covers and therefore gets all his Biblical information from uneducated servants. One section of this novel describes a violent raid on the Circle N cattle ranch after Red Kiersay kidnapped livestock being guarded by Short Andrews and Slug Willard. In one scene from this novel the Good Fairy wakes up a devil because they have to visit the new character Orlick and argue with him to see if he will be good or evil. A meeting at the Red Swan Hotel inspires Anthony Lamont and John Furriskey to rebel against their assigned roles as characters, and the fictional author Dermot Trellis is put on trial by his own characters in a novel-within-this-novel, which is narrated by an unnamed Irish university student. For 10 points, name this 1939 novel, the magnum opus of Flann O’Brien.

ANSWER: AT SWIM-TWO-BIRDS

8. Lazarus and Folkman’s model of this phenomenon explains it as a result of subjective judgments that arise from a person’s transaction with his or her environment. Kirschenbaum developed a protocol for inducing it in the lab using mental arithmetic; that protocol is the Trier Test. The Holmes and Rahe scale links this phenomenon to illness by asking subjects to rate life events on a scale from 100 to 0. Developmental psychologists often study how exposure to the toxic type of this phenomenon harms children. Over time, build-up of this phenomenon increases allostatic load on the body. A model for the body’s response to this phenomenon, General Adaptation Syndrome, was developed by the first psychologist to explain it scientifically, Hans Selye. For 10 points, name this phenomenon, whose chronic type was long thought to cause ulcers.

ANSWER: STRESS

9. This naturally-occurring, non-vitamin compound is sometimes administered in cancer patients to ameliorate symptoms of oral mucositis arising from chemotherapy. The absorption of this compound into the body is severely decreased when it is consumed along with the weight loss drug Orlistat. Sufferers of erythropoietic protoporphyria decrease their sun sensitivity by consuming this compound, which is absorbed in the duodenum by the same membrane proteins that absorb Vitamin E. This is the most common compound in a class of unsaturated C40 hydrocarbons that also includes lycopene; those compounds are contrasted with oxygen-containing xanthophylls. A harmless jaundice-like condition that does not affect the whites of the

eyes results from overconsumption of this compound, which is cleaved to form two molecules of retinal that further react to form vitamin A. For 10 points, name this red-orange pigment abundant in root vegetables like yams and carrots.

ANSWER: BETA-CAROTENE [prompt on CAROTENE]

10. One branch of this religious sect was founded by Florence Louise Crawford, while another was founded by Gaston Cashwell, who was called the Apostle of this movement in the South. The man usually credited as its founder developed this movement at the Bethel Bible College in Topeka, Kansas. This sect gained popularity when William Seymour, the son of a slave and the student of its founder Charles Fox Parham, led a gathering of people on Azusa Street in Los Angeles in the middle of a black ghetto. That gathering spawned several churches of this denomination, known as Apostolic Faith Missions. The teaching of this sect emphasizes the “foursquare gospel,” which was preached by its convert Aimee McPherson. For 10 points, identify this Christian denomination which sees a lot of practitioners speaking in tongues, and is named in honor of a Christian holiday that falls fifty days after Easter.

ANSWER: PENTECOSTALISM [Pentecostal sect, prompt on Charismatic Christianity or Evangelical Christianity, accept the “Apostolic Faith” movement before it’s mentioned, prompt on the “Holiness Movement”]

11. One painting titled after this location features a poster reading, “See that baldheaded guy over there? That’s ‘Curly’ Grogan. He and his mob run the rackets in this town!” A statuette of Minerva sits on a table beside a Japanese ceramic vase on the far left in Henri Fantin-Latour’s painting of this scene “at the Les Batignolles.” Roy Lichtenstein’s series of four paintings titled after this place include pieces subtitled “Foot Medication” and “Look Mickey,” and Daguerre’s first fully completed daguerreotype was titled after this location. In the most famous depiction of this place, a mysterious rabbi stands on the far left beside a grave-digger and a poacher identified as “the exploiters, people who make a living from death.” Alfred Bruyas, Pierre-Joseph Proudhon, and Charles Baudelaire appear on the right side of a painting titled for this location, which is subtitled “A Real Allegory of Seven Years in my Artistic and Moral Life”. For 10 points, name this type of room that names an 1855 Courbet canvas which shows him painting in the title workplace.

ANSWER: the ARTIST’S STUDIOS or PAINTER’S STUDIO [prompt on ATELIER]

12. A two-phase model of this phenomenon was proposed by Field, Goldsmith, and Habing; that model was extended to a three-phase model by McKee and Ostriker with the discovery that this phenomenon also included a hot component with temperatures around 10 to the 6th Kelvin. Gamma ray signals from the decay of aluminum-26 are the most important probes of radioactivity in this material. Structure formation in this material is driven primarily by Jeans collapse and shocks to this material caused by ejecta result in the formation of Herbig-Haro objects. The primary radio signal from this material is the 21-centimeter line produced by hyperfine transitions in its main constituent. The solar wind’s termination shock demarcates the boundary between the heliosphere and the region of space occupied by this material, which mostly comprises neutral hydrogen, HII clouds, and dust grains. For 10 points, identify this matter dispersed throughout the Milky Way which permeates the space between objects like the Sun and Alpha Centauri.

ANSWER: INTERSTELLAR MEDIUM

13. One of these military campaigns saw General Samuel Spear attack Pigeon Hill with about a thousand men, while another one ended after Lloyd Wheaton captured a leader of the Savage Wing council at the town of Pembina. The largest-scale one was planned by T.W. Sweeny and used an attacking force under George Owen Starr. One of these efforts culminated in the Battle at Eccles Hill, while the first one reportedly occurred at Campobello Island. The most influential battle of these campaigns was at the defensive fort of Limestone Ridge - that clash was the Battle of Ridgeway. The perpetrators of these actions were ordered to be arrested for violating the Neutrality Act by generals like George Meade, and they often sought the assistance of men like Louis Riel. These actions were sponsored by, and named for, an organization founded by John O’Mahony as a brotherhood. For 10 points, name these attempts to invade British-ruled Canada, which were launched from U.S. soil by a certain Irish society.

ANSWER: FENIAN Raids [accept any answer implying that Canada is being invaded by FENIANS or members of the Fenian Brotherhood]

14. A god and goddess once entered this city in triumph after the god shook the goddess awake to save her from being killed by a serpent. The Book of Isaiah punned on the Hebrew name for this city by calling it *ir haberes*, or the city of destruction, an

idea that Jeremiah took a step further by prophesying its specific ransacking by Nebuchadnezzar. A stone located in this city was thought to represent the mound that coalesced along with the lotus from the primordial waters. The bull Mnevis, a symbol of this city, was often depicted with a disc in between its horns. According to myths from this city, the world was created when its progenitor spat or masturbated. That god was from the first generation in this city's Great Pesedjet, a grouping of nine deities better known as the Ennead. A single obelisk is all that remains of this city, to which the reborn phoenix brought the ashes of the old phoenix. For 10 points, name this Egyptian cult center of Atum and Ra, which had a Greek name meaning "city of the sun."

ANSWER: HELIOPOLIS [or ON; or 'IR HASEMES before 'ir haheres is mentioned; or 'IR HAHERES before mentioned]

15. Edmund Wilson wrote a notable review about this type of literature titled "Why Do People Read [this genre]?". Monsignor Ronald Knox included the dubious rule "No Chinaman must figure in the story" in his "Decalogue" of "ten commandments" governing this genre's conventions. Ngaio Marsh and Margery Allingham were among the four "Queens" in an era dubbed this area of fiction's "Golden Age", and Émile Gaboriau pioneered it in France. E.T.A. Hoffman's *Mademoiselle de Scudéri* is often cited as this genre's first appearance in Western literature, while its first English practitioner called them "tales of ratiocination." This genre's readership was called "the unknown public" by Wilkie Collins, and its popular practitioners include Ross Macdonald and Dorothy Sayers. Including the "whodunit" subgenre, for 10 points, name this genre of fiction named for characters like C. Auguste Dupin and Sherlock Holmes.

ANSWER: DETECTIVE fiction or stories [prompt on CRIME fiction or MYSTERY novels]

16. A 2001 legal justification for this practice quoted Learned Hand's dictum in *Parke-Davis v. H.K. Mulford*, which was about a related scenario. Congressmen Xavier Becarra and David Weldon introduced a bill banning this practice after reading the appendix to Michael Crichton's novel *Next*, which was highly critical of it. The *Amgen v. Chugai* case greenlighting this practice was one of several to broadly interpret the "anything under the sun" doctrine established by *Diamond v. Chakrabarty*. In 2013, the Supreme Court unanimously ruled against the Myriad company in opposition to this practice, though in that case, Judge Lourie of the Federal Circuit defended this practice by saying that isolating BRCA (breast cancer gene) from its native histone environment made the fragment "not a product of nature." For 10 points, name this bioethically-dubious practice in which holders gain exclusive rights to segments of DNA.

ANSWER: PATENTING GENES [or PATENTING GENETIC material; accept PATENTING DNA before mentioned; accept word forms; prompt on "patenting molecules" or "patenting biological substances"]

17. In a recent play by this author, two characters act out a scene at a Carpathian inn in 1870 when Severin von Kushemski meets Vanda von Dunayev. Nina Arianda won a Tony for her role in that play, which only has a two-actor cast and describes playwright Thomas Novack auditioning an inexperienced actress for an adaptation of the title Leopold von Sacher-Masoch novel, only to discover she is the goddess Aphrodite. This author wrote a play in which Swift, Milton, and Kafka are locked in a room with typewriters as part of an experiment testing whether apes hitting keys at random will ever produce the text of *Hamlet*. This author of *Venus in Fur* wrote about Bill flirting with Betty at a coffee shop in a play where a bell rings to reset the conversation whenever someone says something that screws up the romance. For 10 points, name this contemporary American dramatist who included *Sure Thing* and *Words, Words, Words* in his collection *All in the Timing*.

ANSWER: David IVES

18. The Baladin research group induced a hot spot in this substance and monitored its temperature rise with increased laser intensity by using a Raman spectrometer as a thermometer. It's not a hydrocarbon, but this substance is commonly analyzed using Clar's sextet rule due to each unit having two delocalized pi electrons. This substance exhibits an unusual anomalous quantum Hall effect with four times the normal conductivity, shifted by a factor of $\frac{1}{2}$. Hydrazine reflux is often used to create this substance from an oxide known as SLGO, though this substance is usually synthesized by chemical vapor deposition on copper and nickel surfaces. Despite the fact that its conduction and valence bands touch, this substance is often visualized as a honeycomb lattice of fused benzene rings. Scientific interest in this substance was sparked by Andre Geim and Konstantin Novoselov's 2004 experiment with a piece of Scotch tape. For 10 points, name two-dimensional allotrope of carbon that can be made by slicing open a carbon nanotube.

ANSWER: GRAPHENE [prompt on CARBON before its mention after "For 10 points"]

19. In 1962, the Stuttgart Ballet premiered a version of this ballet which eliminated its final reconciliation scene. That version was choreographed by John Cranko, and includes a dance in which men carry cushions in their outstretched arms and before laying them down and kneeling in front of their wives. This ballet's composer originally chose to give it a happy ending because he claimed "dead people cannot dance," and extracted three orchestral suites from it, which include the movements "Masks" and "The Street Awakens." The ballroom scene in its first act includes the third movement Gavotte from its composer's *Classical* symphony, as well as the "Dance of the Knights." This ballet opens in a marketplace where a quarrel turns into a street fight, and features a famous balcony scene. For 10 points, name this 1936 Sergei Prokofiev ballet based on a Shakespeare tragedy.
ANSWER: ROMEO AND JULIET [or OPUS 64]

20. The run-up to this battle allegedly involved an incident called "The Matins of Good Friday" where several citizens were killed by the local army if they could not correctly pronounce a phrase translating as "shield and friend." This battle was sparked by kidnapping of Guy of Dampierre, whose son Guy of Namurs led one branch of the winning army, while William of Julich led the other. Two factions known as the "men of the lion's claw" and the Leliaerts or "men of the lily" opposed each other prior to the battle, with the former led by Robert of Bethune. An embellished account of this battle was later written by Hendrik Conscience. The losing commander Robert, Count of Artois was killed, as the peasant infantry under the "Lion of Flanders" turned away the army of Philip the Fair. For 10 points, name this 1302 battle in the Franco-Flemish War, also known as the Battle of Courtrai, which gains its nickname from the fact that many dead French soldiers had the namesake decorations on their boots.

ANSWER: Battle of the GOLDEN SPURS [or COURTRAI before it's mentioned]

TIEBREAKER

21. The KAM theory can be used to show that this theorem does not hold for a sufficiently small perturbation of an integrable system because the KAM tori survive; if the perturbation is large enough, the tori do not survive and this theorem holds. The Fermi-Pasta-Ulam experiment discovered that this theorem failed to hold for the coupled anharmonic spring system, because the quantity of interest was shared between only a few modes of the system. This theorem is only assured to hold under the assumption that the ergodic hypothesis is true. One consequence of this theorem is that a purely classical ideal gas must have a constant specific heat, because an alternative formulation of this theorem is that each quadratic term in its energy function contributes one-half times the Boltzmann constant to the specific heat. For 10 points, identify this theorem of thermodynamics according to which, at equilibrium, each degree of freedom of a particle contributes one-half times Boltzmann's constant times temperature to its energy.

ANSWER: EQUIPARTITION theorem

BONUSES

1. Answer stuff about archaeological finds related to the earliest Americans, for 10 points each.

[10] This town in New Mexico gives its name to a culture characterized by 11,500-year old fluted projectile points, traditionally held by archaeologists to be the earliest reliably dated evidence of human habitation in North America. It shares its name with a Frankish king who founded the Merovingian Dynasty.

ANSWER: CLOVIS

[10] First excavated by Tom Dillehay, this Pleistocene settlement on the coast of southern Chile near Puerto Montt is the most widely accepted place to challenge the “Clovis-first” theory. Artifacts found here in 1997 allegedly predate Clovis artifacts by about 1,000 years.

ANSWER: MONTE VERDE

[10] This well-preserved skeleton was accidentally found on the banks of the Columbia River in Washington by two dudes at a hydroplane race in 1996. This “man’s” body has been dated at approximately 9000 years old, providing support for Clovis-type land bridge theories.

ANSWER: KENNEWICK Man

2. In this author’s speech before the 1962 National Student Drama Festival, he outlined two different kinds of silence in his plays. For 10 points each:

[10] Name this British playwright who used silence to undercut Max’s monologue in *The Homecoming*, but also developed a distinctive brand of dialogue in plays such as *The Dumbwaiter* and *The Caretaker*.

ANSWER: Harold PINTER

[10] Theater critic Irving Wardle adapted the subtitle of David Compton’s play *The Lunatic View* to characterize Pinter’s *Birthday Party* as this kind of comedy, whose characters joke about impending threats.

ANSWER: comedies of MENACE

[10] In *The Homecoming*, Pinter included a notable pause immediately after Ruth refuses to give Lenny this object and warns him “if you take [this object] . . . I’ll take you.”

ANSWER: a GLASS of water [or a CUP of water; or any other synonym suggesting a VESSEL of water; prompt on WATER]

3. Einthoven’s triangle is an imaginary construct that helps visualize the placing of the leads used in this technique. For 10 points each:

[10] Name this procedure that uses electrodes attached to the skin to interpret the electrical activity of the heart.

ANSWER: EKG [or ECG; or ELECTROCARDIOGRAPHY; accept word forms, like ELECTROCARDIOGRAM]

[10] Bazett’s formula provides a correction to this part of an EKG readout, a segment representing repolarization of ventricles that is prolonged in a rare condition in which torsades de pointes might lead to sudden death.

ANSWER: QT interval

[10] A large U wave and a small T wave on an EKG is indicative that this substance’s blood concentration is low.

ANSWER: POTASSIUM ion [or K+]

4. This location includes a windy field that blows sharp knives and a mountain range full of crashing peaks. For 10 points each:

[10] Name this nine-tiered underworld, ruled by both a namesake Lord and a Lady, that takes four years to traverse from start to finish.

ANSWER: MICTLAN [prompt on the “Aztec” underworld]

[10] People who were fatally struck by lightning or succumbed to diseases like dropsy did not go to Mictlan, but instead went to the paradise ruled by this child-hating rain god.

ANSWER: Tlaloc [accept Tlalocan]

[10] Among the most terrifying envoys of Mictlan are the Cihuateteo, the spirits of people who died from this cause. They come back to the mortal world to haunt crossroads, snatch up children, and cause diseases.

ANSWER: CHILDBIRTH [or GIVING BIRTH, etc]

5. It included the Panjdeh Incident, during which the Battle at Geok Tepe led to the occupation of Merv. For 10 points each:

[10] Give this term, perhaps used first by Arthur Conolly, to describe the race between Great Britain and Russia for control

of land in Central Asia.

ANSWER: The GREAT GAME

[10] Many accounts hold that the first move in the Great Game was when the Russians forced this dynasty, under its second ruler Fath Ali Shah, to sign the Treaty of Gulistan in 1813, which surrendered Georgia and other khanates in the Caucasus. This dynasty ascended in 1794 by deposing the last member of the Zand dynasty.

ANSWER: QAJAR Dynasty

[10] Even more humiliating than Gulistan was this treaty forced upon the Qajar Dynasty in 1828, which saw the Russians take control of the khanates of Erivan, Nakhchivan, and Talysh, which ended the Second Russo-Persian War.

ANSWER: Treaty of TURKMANCHAY [or Turkmanchai or Torkman]

6. The first one describes Maliboeus abandoning his baby goats on the road after being evicted from his estate to provide land for a former soldier on the day after a political leader's assassination. For 10 points each:

[10] Name this set of poems modeled on the work of Theocritus whose fourth piece contains a notable Messianic prophecy about the birth of a child who will usher in a Golden Age.

ANSWER: ECLOGUES [or BUCOLICS; or ECLOGAE]

[10] Virgil's fifth eclogue is a pastoral elegy in which Mopsus laments the death of this figure, and Menalcas imagines his deification at the gates of heaven. This shepherd is often cited as the inventor of pastoral poetry.

ANSWER: DAPHNIS

[10] The *Eclogues* offer an early example of this recurring theme in Virgil's work, which is named for a Latin phrase in Book One, line 462, of the *Aeneid* when Aeneas looks at a mural of the Trojan War. It translates as the "tears of things."

ANSWER: "sunt LACHRIMAE RERUM"

7. A dozen interludes and variants of a single theme announced by the trumpets appear in this piece's quasi-passacaglia fourth movement, subtitled "The Street Leading to the Castle." For 10 points each:

[10] Name this large orchestral piece, scored for twenty brasses, that was commissioned by the Sokol International Festival and dedicated to the Czechoslovak Armed Forces.

ANSWER: Military SINFONIETTA

[10] This Czech composer of the *Sinfonietta* is better known for composing the operas *Jenufa* and *The Cunning Little Vixen*.

ANSWER: Leos JANACEK

[10] The creation of the *Sinfonietta* and several other pieces by Janacek was fueled by his unrequited love for this married woman, whose 700-letter correspondence with him served as the basis for his second string quartet.

ANSWER: Kamila STOSSLOVA

8. One of these is Thaumiel, which represents duality of God, and is the shadow of the Keter. For 10 points each:

[10] Name this term in Jewish Kabbalah which literally refers to evil "shells" or "husks" that surround the holy Sephiroth on the Tree of Life. Also known as the Sitra Achra, this "land of shells" is the functional equivalent of Hell.

ANSWER: the QLIPHOTH or the KELIPOT or QELIPPOT or QLIPHAH [pronounced: KLI-fauth]

[10] This foundational text of Kabbalah, attributed to Shimon bar Yochai and released by Moses de Leon, defines the Qliphoth as the reverse-side of the Tree of Life, or the cast-off skin of the Sephiroth.

ANSWER: ZOHAR

[10] This German author of *Major Trends in Jewish Mysticism* and *On Kabbalah and its Symbolism* became the pre-eminent scholar of Jewish mysticism in the mid-20th century, and provided several commentaries on the creation of the Qliphoth.

ANSWER: Gershom SCHOLEM

9. The area encompassed by a square of neighbors that are capable of affecting the state of a single unit in this type of construct is known as the Moore neighborhood. For 10 points each:

[10] Identify this type of construct, in which discrete units switch states depending on the states of their neighbors. A famous two-dimensional one of these with Moore neighborhood of size 1 is Conway's Game of Life.

ANSWER: CELLULAR AUTOMATA

[10] Conway's Game of Life has this property, the ability to simulate any other cellular automata. It is equivalent to the same property of a Turing machine which allows it to simulate any other Turing machine.

ANSWER: UNIVERSALITY

[10] Matthew Cook formally proved that this update rule for cellular automata, initially proposed to be universal by its originator Stephen Wolfram, was in fact universal. This update rule is the only one of Wolfram's 88 rules known to be universal and takes its name from the decimal value of its update sequence as written in binary.

ANSWER: Rule 110

10. This artist bought a piece of desert near Marfa, Texas that he turned into the Chinati Foundation. For 10 points each:

[10] Name this artist known for his floor boxes who wrote the seminal essay "Specific Objects" about works of art that cannot be fully classified as painting or sculpture.

ANSWER: Donald JUDD

[10] Donald Judd was a leader of this artistic movement whose other members included Dan Flavin and Robert Smith. *Primary Structures* was the first major exhibition of this movement whose musical practitioners include John Cage.

ANSWER: MINIMALISM

[10] Dan Flavin is known for his brightly colored installations using this material, which he shaped into a frame around an empty wall in a piece titled *a primary picture*. He featured a yellow variety in *Diagonal of Personal Ecstasy* and white ones in *"monuments" for V. Tatlin*.

ANSWER: FLUORESCENTlight or FLUORESCENT TUBE [prompt on LIGHT]

11. This Mexican folk hero served the later portion of his life as governor of Tamaulipas. For 10 points each.

[10] Name this bandit called the "Red Robber of the Rio Grande" who is remembered for capturing Brownsville, Texas in 1859, as part of his namesake war where he led groups of Tejanos against the Texas Rangers.

ANSWER: Juan CORTINA

[10] Later on, Cortina was held in prison on the order of this longtime dictator and Mexican president who, after serving seven terms, was revolted against and ousted by Francisco Madero in 1910.

ANSWER: Porfirio DÍAZ [Jose de la Cruz Porfirio Diaz Mori]

[10] Díaz had a circle of advisors including José Limantour and Ramón Corral, who were known by this Spanish term, because of their technical approach to issues of finance and industrialization.

ANSWER: CIENTIFICOS

12. Ten of the extant books produced by adherents of this philosophical school are concerned with military engineering. For 10 points each:

[10] Identify this philosophical school which advocated an ethics based on the principle of "inclusive concern," and championed the concept of *fa*, or "models" as guides to right action.

ANSWER: MOhism [accept anything like "the school of MO Zi"]

[10] "Inclusive concern," along with the doctrine of "heaven's intention" and "moderation in use," are three of this many core doctrines of Mohist philosophy.

ANSWER: TEN

[10] The Mohism concept of *fa* would later be refined into *fa-jia*, or "the School of Fa," by Han Feizi; the resulting philosophical movement, which advocated standardized weights and measures, as well as standardized, and sometimes excessive, punishments for crimes, became known by this name.

ANSWER: LEGALISM

13. This author wrote a letter that articulated the literary credo, "the artist in his work should be like God in the universe, present everywhere and visible nowhere." For 10 points each:

[10] Name this writer that carried on a lengthy correspondence with Louise Colet, who may have been his model for a character who has affairs with Rodolphe Boulanger and Leon Dupuis.

ANSWER: Gustave FLAUBERT

[10] Flaubert wrote this satirical lexicographical work that defined "omega" as "the second letter in the Greek alphabet" and "guests" as "examples to be set before one's son."

ANSWER: The DICTIONARY OF RECEIVED IDEAS [or Le DICTIONNAIRE DES IDÉES REÇUES]

[10] Flaubert used this famous three-word phrase to describe the goal he pursued in his writing of finding the exact, perfect phrasing.

ANSWER: le MOT JUSTE [or "the RIGHT WORD"]

14. One reason for the prolonged high unemployment levels of the Great Depression is that wages exhibit this behavior in a downward fashion. For 10 points each:

[10] Identify this adjective which describes economic variables whose nominal values are relatively inflexible in the short run.
ANSWER: STICKY [accept: STICKINESS or other word forms; accept: RIGIDITY or word forms]

[10] This school of economics worked with wage and price stickiness to explain market inefficiencies in the short run. Greg Mankiw and David Romer were the early proponents of this school that sought to reconcile an earlier body of work with the critiques of Robert Lucas et al.

ANSWER: NEW KEYNESIAN models

[10] Another contributor to New Keynesian models was this Argentine economist whose namesake pricing model requires that only a portion of agents are able to adjust prices each period. It has been roundly criticized in several studies.

ANSWER: Guillermo CALVO

15. Answer the following about the last stand of paganism in Rome, for 10 points each.

[10] In 384 AD, the orator Quintus Symmachus famously petitioned Valentinian II to restore this great pagan monument in Rome, which had just been removed by Gratian.

ANSWER: ALTAR OF VICTORY

[10] St. Ambrose responded to Symmachus, and won the day, by being a jerk and making fun of pagan Rome having to be saved by cackling geese. Ambrose was a powerful archbishop from this Italian city in Lombardy.

ANSWER: MILAN

[10] This pagan scholar of Rome, active around 400 AD and sometimes called Theodosius by his contemporaries, is known for writing the *Saturnalia*, a dialogue in seven books dedicated to his son Eustachius, which fondly remembers the days of pagan Rome.

ANSWER: MACROBIUS [Ambrosius Theodosius Macrobius]

16. This formula gives a certain quantity as proportional to the area of the event horizon divided by the square of the Planck length. For 10 points each:

[10] Identify this formula devised to ensure that black holes comply with the second law of thermodynamics.

ANSWER: BEKENSTEIN formula

[10] The Bekenstein formula yields this aforementioned quantity for a black hole. This quantity is equal to the Boltzman constant times the log of the multiplicity, and its derivative with respect to internal energy is equal to one over the temperature.

ANSWER: ENTROPY

[10] The Bekenstein entropy of black holes is necessary to avoid an overall decrease in the entropy of the universe when a black hole undergoes this process, during which it theoretically should emit Hawking radiation and its area decrease.

ANSWER: EVAPORATION

17. This character was born Katie Jonas but decided to change her name while she was working as a stenographer. For 10 points each:

[10] Name this charismatic female evangelist who travels around the country and dies in a fire at the New Jersey resort that she had bought as a religious retreat and renamed the Waters of Jordan Tabernacle.

ANSWER: SHARON FALCONER [accept either]

[10] This hypocritical title character of a Sinclair Lewis novel falls in love with Sharon Falconer and works for two years as her assistant before becoming a successful Methodist preacher.

ANSWER: ELMER GANTRY [accept either]

[10] This character was friends with Elmer Gantry in seminary, but is beaten to blindness after Elmer forces him to resign his position as pastor in a rival church by publicly denouncing his religious doubt.

ANSWER: FRANK SHALLARD [accept either]

18. The Furst-Plattner rule is one illustration of this concept, which results in the formation of major and minor products that don't share the same atomic connectivity. For 10 points each:

[10] Identify this concept, in which a chemical reaction results in the predominance of one constitutional isomer over another,

unlike stereoselectivity.

ANSWER: REGIOSELECTIVITY [accept word forms; or REGIOCHEMISTRY; or REGIOSPECIFICITY]

[10] The most widely-known example of regioselectivity is the rule devised by this Russian chemist, which states that the halide component of H-X bonds adds to the less substituted carbon of an alkene.

ANSWER: Vladimir Vasilyevich Nahuel MARKOVNIKOV

[10] This complicated, bridged-dimer dialkylborane provides excellent regioselectivity in hydroboration reactions, explaining why people prefer it to borane, diborane, or disiamylborane (DIE *isa mill* borane).

ANSWER: 9-BBN [or 9-BORABICYCLO[3.3.1]NONANE]

19. In May of 1776, this man became the first colonial diplomat to a foreign country when he served as the first envoy to France, but in December, he was joined by Arthur Lee and Ben Franklin. For 10 points each:

[10] Name this Connecticut Representative who was later fingered by Arthur Lee as a loyalist spy, and may have been assassinated by Edward Bancroft.

ANSWER: Silas DEANE

[10] Deane arranged for shipments of supplies to finance this battle, where Horatio Gates forced the surrender of Gentleman Johnny Burgoyne after fights at Freeman's Farm and Bemis Heights in 1777.

ANSWER: Battle of SARATOGA

[10] While in France, Deane commissioned the services of Lafayette and this German-born Baron, who fought on the right flank of Horatio Gates as secondary U.S. commander at the Battle of Camden, where he died.

ANSWER: Johann de KALB [the Baron de Kalb, or Johann von ROBAIS]

20. This artist unusually set his *Nativity of the Virgin* inside a medieval cathedral and strangely focused the painting's foreground on the church's architectural details rather than Christ's birth. For 10 points each:

[10] Name this artist whose *Landscape with Footbridge* is often cited as the first pure landscape painting in Western art and is best-known for a painting that anachronistically dresses a group of people in red turbans to resemble Turks.

ANSWER: Albrecht ALTDORFER

[10] Albrecht Altdorfer's *The Battle of Issus* is the best-known example of this style of painting pioneered by Joachim Patinir, which shows a sweeping panorama of a symbolic landscape with expansive views of oceans and mountains.

ANSWER: WORLD LANDSCAPE [or WELTLANDSCHAFT]

[10] Brueghel adapted the "world landscape" genre for this painting, which shows a man ploughing in the foreground while only the feet of the title mythological character are seen sinking into the sea.

ANSWER: LANDSCAPE WITH THE FALL OF ICARUS

EXTRA BONUS

21. This general technique involves discretizing the problem domain into an irregular mesh and solving the appropriate differential equations with boundary values within the mesh cells. For 10 points each:

[10] Identify this generic technique in numerical analysis which is typically used to solve partial differential equations in complex geometries where no analytic solution is possible.

ANSWER: finite Element Analysis [or Method]

[10] The finite element method can be derived from this more general eponymous method; this method involves setting the integral of the residual over domain to zero, with the weighting functions being selected from the basis functions that span the domain.

ANSWER: GALERKIN method

[10] Due to their computational efficiency, these functions are typically used as interpolating functions in FEM. By Weierstrass' theorem, any continuous function on a closed interval can be approximated arbitrarily well by these functions; in one dimension they are a sum of terms that are powers of the variable multiplied by a coefficient.

ANSWER: POLYNOMIALS