**HSAPQ**
High School Academic Pyramid Questions

1. The assumption in Britton's lemma is that the word is equal to this. Any element of a coset H acts as one of these for H. In a group, if an element is of this type, it must commute with all other group elements and furthermore there is only one of these elements in a group. This is the result of a function composed with its inverse. In algebra, there are usually written as e. For matrices, this a matrix with ones down the diagonal and zeros elsewhere. For 10 points, name these elements and functions that preserve the operand exemplified by how one times any integer b is b.
ANSWER: **identity** element [or **identity** function; or **identity** map]

001-11-30-08102

2. This philosopher compares a central notion of one work to the claim that a woman either bought a left-hand and a right-hand glove, or a pair of gloves, but not both. He claimed that his mission was to correct the "logical geography" of a certain type of knowledge in a work whose mission he declares is to determine the "logical cross-bearings" of concepts. He criticized a position he claims stems from the confusion of Galilean scientific principles as applying to all existing things, the so-called "Official Doctrine." He claimed that the statements "there occur mental processes" and "there occur physical processes" are not in the same category. For 10 points, name this author who called Cartesian dualism the "ghost in the machine" in his work *The Concept of Mind*.
ANSWER: Gilbert **Ryle**

026-11-30-08103

3. One poem by this author asks, "who are you, who are you?" and begins, "Thinking, tangling shadows in the deep solitude." This poet wrote "the verse falls to the soul like dew to the pasture" in a poem that claims, "love is so short, forgetting is so long." He repeated the line, "Deserted like the wharves at dawn" in a poem that claims, "It is the hour of departure." He wrote the lines, "'The night is shattered and the blue stars shiver in the distance." He began one poem with the line "The memory of you emerges from the night around me." For 10 points, name this poet, whose poem that begins, "Tonight I can write the saddest lines" is found in his collection *Twenty Love Poems and a Song of Despair*.
ANSWER: Pablo **Neruda**

095-11-30-08104

4. A defector from this man's regime later published the book Red Horizons, which detailed many of this ruler's shadowy operations. Salvador Dali complimented this man on his use of a scepter. This man advocated youth involvement in construction and got rid of collegiate sociology programs as part of his "July Theses". Another of his policies declared mothers who had more than 10 children as "heroines" and outlawed most cases of abortion. This man's downfall came after he attempted to remove Laszlo Tokes from his position as a pastor in Timisora, and he succeeded Gheorghe Gheorghiu-Dej as the General Secretary of his nation's Communist Party. For 10 points, name this man who was executed along with his wife Elena on Christmas Day, 1989, the communist dictator of Romania.
ANSWER: Nicolae **Ceaucescu**

048-11-30-08105

5. On a holiday sacred to this deity, bilwa leaves are placed atop a symbol of him, which is bathed in yogurt and rose water every three hours. In one story, this god appeared as a massive pillar of fire and challenged two other deities to find its endpoints. This god is often depicted crushing the evil dwarf Apasmara. This god incinerates the god of love after being woken up by Kama. This god is often depicted in the form of Nataraja, the cosmic dancer. Worship of this god can involve "linga", or sacred stones. This god rides the bull Nandi and uses a trident as a weapon. His wives include Parvati and Kali. For 10 points, name this Hindu god called "the destroyer".
ANSWER: **Shiva**

6. This author wrote a novel in which the teetotaler Coupeau falls from a hospital roof into a play titled *Drink*. He wrote about the maiden Angelique who waits many years to marry a knight only to die the first time they kiss in the novel *The Dream*. The title character of another of his novels is first encountered at a performance of *The Blonde Venus* and ruins her lovers Philippe Hugon and the journalist Fauchery. This author wrote a novel in which the rich Gregoires only gives warm clothes and not food to the impoverished family of Maheude. Later in that novel, Etienne organizes a strike at the Montsou coal mines. This author included *Nana* in his twenty-novel cycle, *Les Rougon-Macquart*. For 10 points, name this French novelist who wrote *Germinal* and "J'Accuse".
ANSWER: Emile Francois **Zola**

7. Two changes of setting in this opera are accompanied by the "Transformation Music." The title character of this opera throws away his bow and arrow in shame after shooting down a swan. Another of its characters is doomed to wander the earth forever because she laughed at Christ on the cross. Six flower-maidens try to seduce the protagonist of this opera in an enchanted garden owned by the villain Klingsor. After having his feet washed by Kundry, the protagonist of this opera heals the wound of Amfortas with the spear that had stabbed Christ. For 10 points, name this opera about an Arthurian knight who seeks the holy grail, the last completed opera of Richard Wagner.
ANSWER: *Parsifal*

8. One deviation from this ideal system is mathematically described by an equation that includes a term proportional to the cube of position, where the proportionality constant is less than zero in the "soft" case. That equation is the Duffing equation. Another deviation from this ideal system is mathematically described by an equal that includes a term proportional to the time derivative of position, where the proportionality constant is known as the damping coefficient. This system itself is described by a second-order differential equation formed by equating Newton's Second Law and Hooke's Law. For 10 points, sinusoidal motion is typical of what kind of system exemplified by pendulums and masses-on-springs?
ANSWER: **simple harmonic oscillator** [or **SHO**; or **simple harmonic motion**; or **SHM**; or mass-on-a-**spring** until "masses"; or **pendulum** before mentioned; prompt on harmonic **oscillator**]

9. In 2003, this country saw the debut of the Blank Noise Project, a women's movement designed to counteract the widespread sexual harassment known as "eve-teasing." It is engaged in a longtime dispute over the Aksai Chin region with the country on its northeast border, which is separated by the Line of Actual Control. In this country's northwest, the border runs through the Thar Desert and the Rann of Kutch, which cover territory in the states of Haryana and Rajasthan. For 10 points, name this larger of the two countries which were partitioned in 1947, the southern neighbor of Pakistan.
ANSWER: Republic of **India** [or **Bharat**]

10. This politician had his men rough up those who didn't discard green ballot envelopes in favor of red votes. This man resigned from his powerless role as Interior Minister for the Commission of Administrative Reforms. Lucien Conein offered $40,000 to this man's generals to stage a coup, leading to his arrest at Cholon and his convoy stopping in front of railroad tracks, where he and his brother were killed. Brothels and opium dens were closed under the guidance of his brother's wife, Madame Nhu. Thich Quang Duc immolated himself to protest this man's anti-Buddhism. This successor of Bao Dai was backed by Kennedy until 1963. For 10 points, name this Catholic president of South Vietnam.
ANSWER: Ngo Dinh **Diem**

11. In a choral work by this composer, a series of commands shouted by a sergeant are met by a men's chorus defiantly singing "Shema Yisroel." His first string quartet is only one movement, takes over forty minutes to perform, and consists of asymmetrical phrases this composer called "musical prose." This composer founded the Society for Private Musical Performances in order to play modernist music, and developed his characteristic style after his wife Mathilde left him for the painter Richard Gerstl. His mature pieces, such as his Opus 26 Wind Quintet and *A Survivor from Warsaw*, lack a key center and often feature the technique of Sprechtsimme. For 10 points, name this leader of the Second Viennese School who developed serialism and the twelve-tone row.
ANSWER: Arnold **Schoenberg**

12. One theory to explain these phenomena was offered by the authors of the "Time to Build" paper, and invokes the neoclassical growth theory to explain them so that interpretations of these phenomena agree with long term growth models. That theory, developed by Finn Kydland and Edward Prescott assumes that technology shocks are the cause for them. Wesley Mitchell is best known for his work regarding these phenomena, and Austrian theory invokes credit levels as the cause of these phenomena, while William Jevons thought that varying sunspot levels are the cause for these. They have variable periodicity, as described by Kondratieff waves and Kuznets waves, and in the United States they are tracked by the NBER. For 10 points, identify these phenomena which are characterized by booms and busts in economic activity.
ANSWER: **business cycle**s [accept: **business cycle fluctuation**s]

13. In the second scene of this play, one character insults two scholars by saying "But that I am by nature phlegmatic, slow to wrath, and prone to lechery." The "B text" version of this play changes the line "Never too late, if" and retains the stable-hand Rafe. In one scene, the title character causes antlers to sprout from the head of a knight at the court of Charles V, for whom Alexander the Great is conjured. Its protagonist is instructed by Valdes and Cornelius. The protagonist of this play wonders "was this the face that launch'd a thousand ships" after he summons Helen. He dies twenty four years after exchanging his soul for the service of Mephistopheles. For 10 points, name this "tragical history" by Christopher Marlowe.
ANSWER: *The Tragicall History of the Life and Death of* ***Doctor Faustus***

14. Elongated shadows are cast by the heads of the figures in this painting upon a long, segmented mirror just behind them. A match container and a baton lie on one table in this painting, which is connected to another by a folded newspaper. George Moore's response to the female figure in this painting was "What a slut." That figure, who wears white headgear, has her hands clasped under the table and her gaze fixed downward depressingly, and has been identified as the actress Ellen Andrée. Next to that woman is a man who is cut off by the edge of the painting, and between them is a glass of the title substance. For 10 points, identify this painting that depicts the alienation caused by a kind of alcohol, created by Edgar Degas.

ANSWER: *L'Absinthe* [or *The Absinthe Drinker*; or *Glass of Absinthe*; or *A Sketch of a French Café*; or *Figures at Café*]

15. This event is believed to have fulfilled a prophecy found in Chapter 9, Verse 9 of the Book of Zechariah, and this event also has parallels with the treatment of Jehu in Chapter 9 of Second Kings. There is a dispute over whether this event involved one or two animals. The primary animal used during this event was found tied up but had never been used before. During this event, the crowd cried out "Hosanna, Blessed is He who comes in the name of the Lord" and waved tree branches. The commemoration of this event begins Holy Week and occurs seven days before Easter. For 10 points, name this event commemorated on Palm Sunday, in which Jesus rode a donkey into Christianity's holiest city.

ANSWER: **Entry of Christ into Jerusalem**

16. The propylthio version of this compound is used in the treatment of hyperthyroidism. A derivative of this compound is administered with leucovorin in a common chemotherapy drug; that derivative is the 5-fluoro version. This compound is synthesized via the decarboxylation of orotic acid. Nirenberg showed that polymers composed exclusively of it code for peptides containing only phenylalanine. The deamination of cytosine leads to this compound, a pseudo-version of which is present in tRNA. Originally discovered in hydrolyzed herring sperm, this pyrimidine has two ketone groups. For 10 points, name this base pair which replaces thymine in RNA and pairs with adenine.

ANSWER: **Uracil** or **uridine**

17. This man's stepfather, Henry Watkins, was able to help get this man's career started by finding him work in the chancery office of Peter Tinsley. As a state representative, this man introduced a resolution for all members to wear homespun clothing, which eventually led to his fighting a duel with Humphrey Marshall. He was the defendant in a lawsuit filed by Charlotte Dupuy in an attempt to secure her release from slavery. This politician worked on the Treaty of Ghent with a man for whom he later served as Secretary of State. That role came about after an event dubbed the "Corrupt Bargain" took place. For 10 points, name this member of the Whig party who was known as the Great Compromiser.

ANSWER: Henry **Clay**, Sr.

18. The Karlsruhe experiment tested this using sodium. Glatzmaier and Roberts developed the first self-consistent model for studying this theory. A similar theory in astronomy was shown to be possible by Eugene N. Parker by overcoming issues raised by Cowling's anti-theory of this. It gives rise to alpha and omega effects One issue in modeling this is heat flow across the CMB. Proposed mechanisms for the required energy include the freezing of deposited materials and decay of radioactive isotopes. The velocity needed for this to work is dependent on the magnetic Reynold's number. For 10 points, name this theory that Earth's magnetic field is caused by moving, electrical conductive fluid in the outer core.

ANSWER: geo**dynamo** theory

19. Richard Wagner and other revolutionaries were forced to flee this city after its disastrous "May Uprising" was squashed in 1849. Frederick II was allowed to control Silesia in return for acknowledging Francis I as Holy Roman Emperor in a treaty named for this city, which ended the Second Silesian War. Napoleon marched the Imperial Guard ninety miles in three days to save this city from Schwarzenberg in his last great victory in Germany. This city was known as the "Florence on the Elbe," and replaced Wittenberg and Meissen as the capital of Saxony. For 10 points, name this German city that was extensively firebombed by the Allies during World War II.
ANSWER: **Dresden**

20. The protagonist of this novel is unable to obtain information after Randolph Driblette's suicide. Stanley Koteks refers the main character to John Nefastis who claims to have invented a perpetual motion machine, and she visits a bar named The Scope with where she learns about the Peter Pinguid Society from Mike Fallopian. The protagonist has a vision of a post horn while investigating Richard Wharfinger's play *The Courier's Tragedy*. This novel begins when the protagonist becomes the executor of Pierce Inverarity's estate whose stamp collection contains a symbol associated with the Trystero organization. For 10 points, name this novel in which Oedipa Maas discovers a conspiracy between rival mail companies, written by Thomas Pynchon.
ANSWER: *The **Crying of Lot 49***

21. The protagonist of this novel is duped by a man claiming to be part of a secret society called the "calf's head." The artist Pellerin constantly changes his portrait of a woman nicknamed the "Marshal," while the main character goes to an auction where he is shocked to find that his own his own furniture is being sold in retaliation for borrowing money from his mistress Madame Dambreuse. The protagonist of this novel shares an apartment during law school with Charles Deslauriers and during a voyage down the Seine in this novel's opening chapter he first sees his love, Madame Arnoux. For 10 points, name this novel about Frederic Moreau, written by Gustave Flaubert.
ANSWER: ***Sentimental Education*** [or ***L'Éducation Sentimentale***]

22. The forces of one side in this battle were partially commanded by Moharem Bey, whose note to the enemies asking them not to advance into the main field of combat was met with a reply that they intended to give orders and not to take them. This battle broke out when one side spotted a fireship being prepared for launch, and it took place at the site of the ancient city of Pulos. The winning side was aided by French ships under Henri de Rigny and Russian vessels under Login Geiden, and that side's commander was Edward Codrington, who became the last person to win a battle of wooden capital ships. Ibrahim Pasha's violations of the Treaty of London led to, for 10 points, which 1827 naval battle during the Greek War of Independence?
ANSWER: Battle of **Navarino**

23. The Q-e scheme regards the reaction rate of monomeric examples of these substances. AIBN is used to create these substances for synthesis reactions and another example of these is TEMPO. The effectiveness of starting a reaction using these can be decreased by solvent cage effects. Heat or an initiator is used to create these through homolysis of precursors like diatomic chlorine. Specific applications of these species include both polymerization and cracking. They aren't carbocations, but they can be stabilized by hyperconjugation and mechanisms involving them use fishhook curly arrows. For 10 points, name usually reactive these species with an unpaired electron, whose damage to cells can be prevented by antioxidants.
ANSWER: free **radical**

1. Name some dissenting religious movements, for 10 points each.
[10] Lead by John Wycliffe, this English movement stressed the importance of scripture in Christianity and claimed that the office of the Pope lacked any justification.
ANSWER: **Lollards**
[10] This sect stresses the importance of the Holy Spirit and "inner light," the direct awareness of God present in all people. One belief of this sect is the "peaceable kingdom," the idea that predatory animals will become docile after the return of Christ.
ANSWER: **Quaker**s [or **Society of Friends**]
[10] Supported by Blaise Pascal, this belief claimed to be derived from St. Augustine and put a great emphasis on original sin. It was declared heretical in 1655 in the bull *Cum occasione.*
ANSWER: **Jansenism**

100-11-30-08201

2. As a baby, his face was run over by a carriage carrying the Hillards family's groceries. For 10 points each:
[10] Name this character who decides to go to Harvard after dreaming of his dead brother Ben while spending his last night in the Dixieland boardinghouse run by his mother Eliza.
ANSWER: **Eugene** Gant [prompt Gant; do not accept or prompt George Webber]
[10] Eugene Gant first appears in this author's novel *Look Homeward, Angel* , which takes its title from Milton's *Lycidas*. He wrote a sequel titled *Of Time and the River*.
ANSWER: **Thomas Wolfe** [prompt Wolfe; prompt T Wolfe; do not accept or prompt Tom Wolfe]
[10] Eugene lives in his mother boarding house in this fictional town based on Wolfe's hometown of Asheville, North Carolina.
ANSWER: **Altamont**

079-11-30-08202

3. Mr. Wakem buys the title residence in this novel. For 10 points each:
[10] Identify this novel that concludes with siblings Tom and Maggie Tulliver dying after a flood ravishes their village of St. Ogg's.
ANSWER: *The **Mill on the Floss***
[10] *The Mill on the Floss* is a novel by this author of *Middlemarch*.
ANSWER: George **Eliot** [or Mary Ann **Evans**]
[10] In George Eliot's *Silas Marner*, Silas ends up caring for this child of Molly Farren and Godfrey Cass.
ANSWER: **Eppie**

094-11-30-08203

4. Software like QEMU run these and Xen acts as a monitor for these. For 10 points each:

[10] Name these programs that run a self-contained operating system on top of a host machine. They protection from certain attacks by preventing the host machine from being compromised even if these are compromised.

ANSWER: **virtual machine**

[10] This other technology used to stop attacks randomizes the location of important data in a process' memory space, such as the libraries it uses.

ANSWER: **A**ddress **S**pace **L**ayout **R**andomization

[10] One way to prevent external attacks is by using one of these programs that blocks predetermined types of network traffic. Commonly this is done by shutting off certain ports or stopping traffic to and from certain addresses.

ANSWER: **firewall**

5. Originally composed for harpsichord, it was twice recorded by Canadian pianist Glenn Gould. For 10 points each:

[10] Name this set of nine canons and twenty-one adaptations of a central aria, named for one of the composer's students.

ANSWER: *The **Goldberg Variations***

[10] This Baroque German composer wrote *The Goldberg Variations*.

ANSWER: Johannes Sebastian **Bach**

[10] This Danish contemporary of Bach earlier included thirty-two variations for harpsichord in *La Capricciosa* and composed the oratorio *Membra Jesu Nostri*.

ANSWER: Dietrich **Buxtehude**

6. Name the following about reform in ancient Rome, for 10 points each:

[10] This emperor increased Roman revenues enormously by standardizing tax collecting and spreading it consistently around the empire. He was known as Octavian until he became the first emperor.

ANSWER: **Augustus**

[10] The advocacy of Terentilius was crucial in the creation of this ancient law code, which was completed after a plebeian secession in 449 BC.

ANSWER: **Twelve Tables**

[10] This reformer proposed serious populist land reforms in the Lex Sempronia Agraria and was killed while running for tribune in 133 BC.

ANSWER: **Tiberius Gracchus** [prompt on **Gracchus**]

7. One version of this scene, in the main altar of the Santa Maria Gloriosa dei Frari, shows God the Father at the top welcoming the title figure with open arms. For 10 points each:
[10] Identify this scene, where the twelve apostles can be seen gathered around the title female's tomb in a version by Rubens.
ANSWER: The **Assumption** of the Holy **Virgin** Mary [or **Assumption of Mary**]
[10] One notable version of *The Assumption of the Virgin* was painted by this man, who included two cheetahs in his *The Meeting of Bacchus and Ariadne*. He also painted the *Madonna of the Pesaro Family*.
ANSWER: **Titian** [or Tiziano **Vecelli** or Tiziano **Vecellio**]
[10] Titian is probably best known for this painting, which heavily influenced Manet's *Olympia*. In it, a dog sleeps next to the nude title character as two servants look into a chest in the background.
ANSWER: *The **Venus of Urbino***

8. Most continuous logistic solutions for a population approach this value. For 10 points each:
[10] Name this maximum population size of a given species that an environment can support.
ANSWER: **carrying capacity**
[10] Square instances of these mathematical objects named for Leslie can be used to model a discrete age structured population.
ANSWER: **matrix** [or **matrices**]
[10] The first row of a age structured Leslie matrix contain the class specific values of this reproductive potential of a female. This is not the same as fertility, which is the realized version of this.
ANSWER: **fecundity**

9. Name these masters of the short story, for 10 points each.
[10] This French author of "Le Horla" wrote about the devastating realization that the title object was a fake in "The Necklace."
ANSWER: Guy de **Maupassant**
[10] This Russian came to prominence with his novel *The Village* but is largely remembered for stories like "The Gentleman from San Francisco."
ANSWER: Ivan Alekseyevich **Bunin**
[10] This Canadian has cemented her reputation as a short story author with collections titled *Runaway*, *Dance of the Happy Shades*, and *Hateship, Friendship, Courtship, Loveship, Marriage*.
ANSWER: Alice **Munro**

10. Answer these questions about quasiparticles, for 10 points each.
[10] This quasiparticle, which is the quantum of the normal vibrational mode, represents the vibrational energy that arises from oscillating atoms in a crystal.
ANSWER: **phonon**
[10] Phonon distributions can be probed using this form of spectroscopy. It works by having laser light interact with vibrations in matter, producing Stokes and Anti-Stokes frequencies.
ANSWER: **Raman** spectroscopy
[10] Phonons are utilized by the Debye model of heat capacity which predicts that at low temperatures, the heat capacity is proportional to this power of the ratio of the temperature to the Debye temperature.
ANSWER: **cubic** [or **cube**; or **third**]

11. This conflict is also known as the Saltpeter War. For 10 points each:
[10] Name this war in which Peru and Bolivia fought together against another neighboring country.
ANSWER: War of the **Pacific**
[10] Peru and Bolivia fought against this nation that signed the Treaty of Piece and Friendship with Bolivia in 1904 in its capital of Santiago.
ANSWER: **Chile**
[10] In 1880, the three parties conducted failed negotiations aboard this U.S. ship, for which the conference is named. Chile refused to withdraw its forces from lands it had occupied during the war.
ANSWER: **Lackawanna** Conference [or **Arica** Conference]

12. This country became an independent nation after the 2006 severance of its union with Montenegro. For 10 points each:
[10] Name this country of Gavrilo Princip, who assassinated Archduke Franz Ferdinand.
ANSWER: **Serbia**
[10] Although the Serbian Milos Obilic managed to assassinate Murad I, Prince Lazar was defeated by the Ottomans at this 1389 battle.
ANSWER: Battle of **Kosovo**
[10] The Battle of Kosovo occurred on the feast day of this saint, who was martyred with Modestus and Cresentia under Diocletian. He is the namesake of a massive Cathedral in Prague.
ANSWER: Saint **Vitus**

13. Her autobiography, *The Long Loneliness,* describes why she converted to Catholicism after several years of working for socialist newspapers. For 10 points each:
[10] Name this leader of the Catholic Worker movement, who co-founded that group's namesake newspaper with Peter Maturin.
ANSWER: Dorothy **Day**
[10] An earlier newspaper that Day worked for shared its name with this anti-slavery journal operated by William Lloyd Garrison.
ANSWER: *The **Liberator***
[10] Another Catholic public figure of the 1930s was this publisher of *Social Justice,* a Detroit priest whose popular radio program attacked Jews and the Roosevelt administration.
ANSWER: Father Charles Edward **Coughlin**

14. This bandleader assembled a nonet for an album that helped spark "West Coast Jazz," his *The Birth of the Cool*. For 10 points each:
[10] Name this jazz trumpeter who included the track "Freddie Freeloader" on his album *Kind of Blue*.
ANSWER: Miles **Davis**
[10] Davis worked with Gil Evans on this album, which includes arrangements of "Concierto de Aranjuez" and other songs from an Iberian nation.
ANSWER: ***Sketches of Spain***
[10] This Davis album includes tracks like "Pharaoh's Dance" and "Spanish Key" and was controversial at the time for including electric instruments and a rock sensibility.
ANSWER: ***Bitches Brew***

15. Name these German sociologists, for 10 points each.

[10] This thinker argued that a state has a "monopoly on the use of force" and credited the reformation for the rise of capitalism in *The Protestant Ethic and the Spirit of Capitalism*.

ANSWER: Max **Weber**

[10] This man was best known for drawing the distinction between the concepts of Gemeinschaft and Gesellschaft, which are loosely translated as community and society.

ANSWER: Ferdinand **Tonnies**

[10] This author of *The Philosophy of Money* discussed the ways that urban life effects the intellectual in his essay *The Metropolis and Mental Life*.

ANSWER: Georg **Simmel**

16. This man classified tautological, contradictory, and empirical statements as the meaningful ones in his work that tries to eliminate the title constructs,, his *Pseudoproblems in Philosophy* . For 10 points each:

[10] Name this German thinker that also wrote *The Logical Structure of the World* .

ANSWER: Rudolph **Carnap**

[10] This philosophical discipline is the oft-discussed disciplined to be eliminated in Carnap's *Pseudoproblems in Philosophy.* This discipline generally deals with the first cause of things. Kant wrote about the *this* of morals.

ANSWER: **metaphysics**

[10] Carnap's compatriot Hempel attacked this approach to acquiring knowledge with the raven paradox. This approach involves deriving generalizations from specific cases.

ANSWER: **induction**

17. Children are encouraged to scream on this holiday, which is celebrated one day later in walled cities. For 10 points each:

[10] Name this Jewish holiday commemorating Esther's deliverance of the Jews from an evil Persian king.

ANSWER: **Purim**

[10] Celebrants of Purim are supposed to get so drunk that they cannot distinguish the phrase "Blessed be Mordechai" from the words "Cursed be [this man]," the evil Persian councilor.

ANSWER: **Haman**

[10] It is considered a mitzvah on Purim to pronounce the names of the ten sons of Haman in this manner.

ANSWER: **in one breath** [or equivalents]

18. Paul Ehrenfest classified these based on the order derivative of the free energy with respect to a thermodynamic state variable needed for a discontinuity. For 10 points each:

[10] Name this changes that are also the study of Landau theory.

ANSWER: **phase transition** [or **phase change**]

[10] On a PT diagram, these curves separate phases such as liquid and solid.

ANSWER: **coexistence** curve

[10] The coexistence curve for a liquid and its vapor can be determined this equation named for two scientists. It states that the derivative of the log of pressure with respect to temperature equals delta H over R T squared.

ANSWER: **Clausius-Clapeyron** equation

19. One story about this man in the Muslim tradition claims that Muhammad invoked his knowledge of this man to prove to members of the Quraysh that he was a prophet of God. For 10 points each:

[10] Name this Old Testament prophet, who more notably was swallowed by a giant fish when he tried to shirk his duty.

ANSWER: **Jonah**

[10] Jonah is sent to warn this city to repent. When the citizens of this city do indeed renounce their evil ways, Jonah becomes despondent out of worry that his task was pointless.

ANSWER: **Nineveh**

[10] The story of Jonah appears in the second Biblical book of this name, which also includes the assumption of the throne by David's son Solomon.

ANSWER: **Kings**

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20. The characters of this work flee Florence for ten days as a plague passes through the city. For 10 points each:

[10] Name this collection of 100 short stories by Giovanni Boccaccio.

ANSWER: *The **Decameron***

[10] In the last story from *The Decameron*, this extremely patient character marries Gualtieri, who tests her by pretending to have their children executed and to leave her for another woman.

ANSWER: **Griselda**

[10] A famous section of *The Decameron* describes a parable about three of these objects in which Saladin questions Melchizedek about the origins of the three major monotheistic religions. It was later borrowed by Gotthold Lessing for *Nathan the Wise*.

ANSWER: **ring**s

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21. This property is share by both the empty and whole space. For 10 points each:

[10] Name this type of set, the complement of an open set.

ANSWER: **closed** set

[10] This type of set consists of the set of all subsets of a starting set. For a starting set with n elements, this type of set consists of $2^n$ elements.

ANSWER: **power** set

[10] These are sets with relational structure such that every non-empty subset has a least element.

ANSWER: **well ordered** set

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