

1. Shortly after the occurrence of this event, its main participant delivered a speech which commended a contemporary politician as "a man of integrity who is acutely aware of the dangers of a public figure not honoring his undertakings," but noted that the "reality is that we are still suffering under the policy of the Nationalist government." This event was preceded by nine days by the legalization of previously outlawed parties, including the Communist party, by a leader who had recently won a presidential election by beating the "verligte," or "enlightened," candidate, Barend du Plessis. Prior to the occurrence of this event, the first photograph of its central figure in 20 years was released, which showed this event's central participant together with F.W. de Klerk. Captured in an iconic photo of its main participant with his fist raised together with his wife Winnie, for 10 points, identify this event that occurred on February 11th, 1990, in which the leader of the ANC gained his freedom.

ANSWER: Nelson **Mandela's release** from **prison** [accept anything that identifies Mandela being released from captivity]

2. One character in a work by this composer repeats the line "Oh messmates take me up, for I'm sinking with the tide" after single-handedly sinking the Turkish Galilee. He's not Dmitri Shostakovich, but one movement of another of his choral works is accompanied by repeated transpositions of the DSCH motif, which is sung to the text "For the silly fellow is against me". That work also features the soprano solo "For I Will Consider My Cat Geoffrey", and is a setting of the poetry of Christopher Smart. Besides *The Golden Vanity* and *Rejoice in the Lamb*, this man composed a work for treble choir which includes movements like "Adam lay i-bounden" and "Balulalow", and whose C-flat major harp interlude quotes the opening processional, "Hodie Christus." This composer of *A Ceremony of Carols* interpolated such poems as "Futility" and "Strange Meeting" into a Mass in another work. For 10 points, name this composer who set some poems by Wilfred Owen in his *War Requiem*.

ANSWER: Benjamin **Britten**

3. Although originally devised for job scheduling, the Coffman-Graham algorithm can be used to perform this task on layered inputs. Gansner and Koren produced a "circular" algorithm for accomplishing this task, in which performance is improved via an auxiliary routing algorithm. The Kamada-Kawai algorithm for performing this task improved on Eades' heuristic algorithm by using a spring model and making the geometric distance proportional to the topological distance. Another algorithm for carrying out this task is the Fruchterman-Reingold algorithm, which combines attractive and repulsive forces in a manner analogous to nuclear forces and reduces a so-called temperature parameter until an optimal configuration is achieved. Those algorithms are part of a class of force-directed algorithms for performing this task, which seeks to generally minimize edge crossings and equalize edge length. For 10 points, identify this task which consists of visually rendering a structure made up of nodes and edges.

ANSWER: **graph drawing** or **layout**

4. One character in this novel goes to Cornell to study biology but never finishes his degree, eventually moving to California to become a therapist and falling in love with a woman named Katya whom he meets at a hunger strike. A pivotal moment in this novel comes when a main character is expelled from the Mt. Ephraim country club for throwing his beer into Judge Kirkland's face, and after that character's roofing company fails, this novel's title group is forced to sell High Point Farm. The revenge plot of this novel is concocted by Patrick, the middle son of Michael and Corrine, the parents of the title family. This novel is narrated by Judd, the youngest member of the title family, who helps Patrick acquire the gun with which Patrick plans to shoot Zachary Lundt for the rape of Judd's and Patrick's sister Marianne, but

instead Patrick rescues Lundt from drowning in a bog and lets him live. Ending with the title family's reunion after the death of Mike Sr., for 10 points, identify this novel by Joyce Carol Oates.

ANSWER: **We Were the Mulvaney**s

5. This man opened one work with the observation that "it is hard to be a minor writer... especially in the United States," and in that work, declared its subject, Sherwood Anderson, to have been a minor writer who in "a few crucial instances... did first rate, perhaps even major, work." In another work, this man argued that the downfall of the title ideology was partially attributable to "Emersonianism," and suggested that it declare itself "a partial ally of a liberalism with which it shares fundamental democratic values." In addition to that collection of essays titled *Socialism and America*, this man borrowed Stendahl's quote that "politics in a work of literature is like a pistol shot in the middle of a concert," to begin a work of criticism that praised *The Possessed* as the greatest political novel; that book was titled *Politics and the Novel*. This man wrote about the process of Eastern European Jewish immigration and assimilation into America in his National Book Award-winning *World of Our Fathers* and much of his writing was done in a quarterly he founded with other New York intellectuals in 1954. For 10 points, identify this socialist Jewish thinker and critic who co-founded *Dissent*.

ANSWER: Irving **Howe**

6. The title character of this novel is saved from the attentions of Sir Percy when a visitor arrives informing her that Lady Emma is to undergo a serious operation. This novel's title character authors a work titled *The Princess Egeria*, which becomes a bestseller whose editions "run like fires in summer furze." Having been forced to sell the title estate, the main character of this novel sells political information confided to her by Sir Percy, and gains a measure of freedom after her husband is run over by a streetcar. After being seen accompanied by Lord Dannisburgh, this novel's title character is targeted in a divorce suit by her first husband, Augustus Warwick, and at this novel's end, she marries Thomas Redworth. The likely model for this novel's title character was the author's own wife, whom the author had written about in the sonnet sequence *Modern Love*. For 10 points, identify this novel about a liberated Victorian woman by George Meredith.

ANSWER: **Diana of the Crossways**

7. The complete segregation and maximum mixedness models are commonly used to derive this function. This function is equal to tau squared over quantity two t cubed for a LFR. For a CSTR, it is one over tau times e to the negative t over tau, while for a PFR, it is the Dirac delta of t shifted by tau. For a step input and pulse input, respectively, this function can be obtained by taking the time derivative of the F curve or by dividing the C curve by the area under the C curve. Because this function is a probability distribution function, its first moment gives the mean exit age of a molecule. For 10 points, identify this distribution of the time a molecule has spent in a chemical reactor.

ANSWER: **residence time** distribution [or **RTD**; or **exit age** distribution or **E of t** until "exit ages" is read]

8. According to both Plutarch's and Diodorus Siculus' account of this battle, one commander's life was in danger when his helmet was split by a sword, but he was saved by Celitus the Black. Prior to this battle, the losing commanders rejected a scorched-earth policy proposed by Memnon of Rhodes, who commanded a force of mercenaries at this battle. According to Arian's account of this battle, it began with a charge by a small vanguard commanded by Amyntas designed to draw the opponents out of their formation in order to make the susceptible to a cavalry charge by the Companions. Parmenion commanded the left wing for the victors at this battle, which resulted in the deaths on the losing side of the commanders Rhoesaces, Mithrobuzanes, Spithridates, and Omares, who along with Memnon commanded the Greek mercenaries. The first of three major battles against the Persian empire, for 10

points, identify this 334 B.C.E. victory for the Macedonians under Alexander the Great.

ANSWER: Battle of the **Granicus** River

9. Historically, the movement to prohibit this action was first advocated in the early 12th century C.E. by Bruno the Carthusian, based on the writings of the 4th-century commentator Ambrosiaster. Abelard defended this action against critics of it at the School of Laon in his *Theologia christiana*. The schism between the Community of Christ, or RLDS church, and mainline Mormonism persists partly due to the fact that the RLDS has allowed the performance of this action since 1984. In Catholicism, this action is prohibited by Canon 1024, contained in Book IV, part I, title VI, and in 2008, Pope Benedict XVI issued an edict making those who seek to perform this action immediately punishable via excommunication. Arguments against this action, allowed since 1956 by Methodists, typically focus on readings of 1st Timothy and 1st Corinthians. For 10 points, identify this action which would involve making a woman a part of church hierarchy.

ANSWER: **female ordination** [accept "women priests" or the like]

10. This philosopher bemoaned the fact that "modern man's average day contains virtually nothing that can still be translated into experience," in an essay analyzing "the destruction of experience," titled "Infancy and History." A seminar dedicated to investigating the "place of negativity" in Heidegger that forms at the intersection of the two title concepts led to this philosopher's early work, *Language and Death*. Another work by this philosopher takes as its subject what he called the "bare life," a term he used to describe those who under Roman law could be killed by anyone, but not ritually sacrificed. This philosopher drew on Carl Schmitt's *Political Theology* in a study which seeks to explicate the "no man's land between public law and political fact," which arises in situations such as civil war, called *The State of Exception*. For 10 points, identify this Italian philosopher who also wrote *Homo Sacer*.

ANSWER: Giorgio **Agamben**

11. Key testimony before this investigative body came from Edgar Brown, who claimed that he had been "placed in the category of the man who seeks to put his own mother out of his house." One consequence of the work done by this investigative body was the Fletcher-Rayburn Act, partially named for Duncan Fletcher who together with Peter Norbeck headed this investigative body. Among the sections in the 400-page report produced by this investigative body were ones on "Manipulative devices," and "Abuse of proxies," as well as a chapter dedicated to investigating "Income-tax Avoidances." Authorized by Senate Resolution 84, this investigative body took its name from the New York deputy district attorney who subpoenaed men like New York Stock Exchange president Richard Whitney and National City Bank chairman Charles Mitchell, and its conclusions led to the passage of the Glass-Steagall Act. For 10 points, identify this 1932-1933 Senate investigation into securities, commercial banking, and investment banking practices.

ANSWER: **Pecora** Commission or Investigation

12. Together with his friend Ficsur, this work's title character concocts a plan to become rich by robbing a cashier who every Saturday transports workmen's wages. The title character and his wife move into the photographer's shop run by Mrs. Hollunder, where they have a daughter named Louise to whom the title character, at the end of this work, gives a star that he stole from heaven. The title character of this play commits suicide when his and Ficsur's robbery attempt fails, and is taken to heaven where he is sentenced to sixteen years of purification by fire before being made to return to face his wife and daughter unrecognized. The title character is first encountered serving as a barker at Mrs. Muskat's merry-go-round at a Budapest carnival where he meets and marries his wife Julie. For 10 points, identify this play subtitled "A Legend in Seven Scenes," by the Hungarian dramatist Ferenc Molnar.

ANSWER: **Liliom**

13. During one scene in this film, a girl crawling around in an attic captures and kills a cat by feeding it poisoned milk, after which she runs off with the cat's body to a ruined castle where she commits suicide. The suicide of Esti leads the main character of this film to give a long speech in which he asks for money to help form an autonomous collective, and later, that main character and Esti's brother Sanyi have a vision of Esti's spirit on the grounds of Wekenheim castle. This film begins with a shot of cows among the ruins of a village, and its first section, titled, "The News is They Are Coming," is introduced by a narration which describes how one rainy October morning, Futaki was awoken by the sound of bells. Famous for its long shots of the bleak landscape, many of which drag on for over 10 minutes, this film focuses on Irimias' and Petrinias' scheme to abscond with the money that the villagers stand to gain from the closing of a failed collective farm. For 10 points, identify this seven-hour long film based on a Laszlo Krasznahorkai novel of the same name, one of the best known works of Hungarian director Bela Tarr.

ANSWER: **Satantango**

14. After being falsely told by his wife Astydamia that Peleus had tried to rape her, Acastus stole Peleus' magic sword while the two were engaged in this activity. Chara and Asterion were two animals that aided Bootes in this activity. The Slavic folk hero Ivan Savelevich spent a winter with a rusalka, whom he found while doing this. Cuchulain was discovered when Conchobar and Fergus Mac Roich were interrupted while participating in this activity. The master of Ydalir, a son of Sif and stepson of Thor, is described in the *Skaldskaparmal* as the "god of the snowshoe" and the god of this activity; that god's name is Ullr. While engaging in this activity, Actaeon happened on a naked Artemis, who changed him into a stag that was torn apart by his hounds. For 10 points, identify this activity that was also organized to catch the Calydonian boar, over which Artemis ruled.

ANSWER: **hunting**

15. As a soldier, this novel's main character takes out a machine-gun nest before being wounded in the leg by shrapnel, and before losing consciousness sees a statue of the Virgin illuminated as a woman he knew from home. During his convalescence, the main character of this novel carries on a brief romance with Diana Marfleet. This novel concludes with an inquiry, revealed in a sequel to have been made by David Staunton, regarding who killed David's father, and the novel itself is cast as a letter from the narrator to his former headmaster. As a child, the main character of this novel performs magic tricks for his friend Paul Dempster, whose mother Mary had been sent into premature labor by a snowball thrown by Boy Staunton, and who is later encountered in this novel using the stage name Magnus Eisengrim. This novel takes its name from a phrase used by Leisl to describe its protagonist, which refers to the non-major characters of a drama who help advance the plot. Followed by *The Manticore* and *World of Wonders*, for 10 points, identify this novel about Dunstan Ramsay, the first of Robertson Davies' *Deptford Trilogy*.

ANSWER: **Fifth Business**

16. The third chapter of this work, "Inside Out," argues that its subjects "convince us that we are one of them... by making privilege democratic and democracy aristocratic." This work's penultimate chapter, "Easy to Be Hard," quotes extensively from Burke's *The Sublime and the Beautiful* to argue that the subjects of this work view war as an opportunity for reinvigoration rather than as something to be avoided. This work also argues that Ayn Rand and the Nazis "share a patrimony in... vulgar Nietzscheanism," while its chapter on "Remembrance of Empires Past," chronicles the rise to prominence of the ideas of people like Irving Kristol, Fred Kagan, and Paul Wolfowitz. Arguing that "conservatism is the theoretical voice of... animus against the agency of the subordinate classes," for 10 points, identify

this work of political theory whose title puns on a similarly named work by Russell Kirk, written by CUNY political theorist Corey Robin.

ANSWER: The **Reactionary Mind**

17. The canonical article about this painting was written by Julius Held, who argued that the title of this painting was misleading and that the melancholy shown by the title character represented "an awareness of the fickleness of princely favor." Commissioned by the Sicilian noble Antonio Ruffo, this painting was to be accompanied by a pendant commissioned from Guercino, as well as two other paintings, now lost, by the original artist, whose focus would be on the two other individuals besides the title figure represented in this work. This work's title figure wears a wide-brimmed black hat and rests his left hand on a gold chain, which according to Held represented worldly wealth and honor, one of the "two sets of values," depicted in this work. The other set of values, representing what Held called "unequaled diction and thought," are represented by the object on which the title figure rests his right hand, though he does not appear to be looking directly at it. For 10 points, identify this Rembrandt painting depicting the teacher of Alexander the Great with a sculpted representation of a blind Greek poet.

ANSWER: **Aristotle** Contemplating the Bust of **Homer** [accept anything mentioning "Aristotle" and "Homer" as the painting is often known by multiple titles]

18. An early solution to the problem of these phenomena was provided by a 1937 paper by Bloch and Nordsieck. Lee and Nauenberg have shown that these phenomena can be eliminated by summing over both acceptable final states and the correct distribution of initial states. In the Drell-Yan process, these phenomena emerge as a consequence of the presence of gluon fields, and if those fields couple to other massless fields, the collinear variety of these phenomena occur. These phenomena occur during processes like "soft" bremsstrahlung and are usually resolved by imposing a low-energy cutoff below which the photon energy is not measurable, and including photons below that energy in the emission calculation. Occurring in theories with massless particles, for 10 points, identify this phenomenon in which QED integrals diverge as the particle momentum goes to zero, as opposed to infinity.

ANSWER: **infrared** divergence or catastrophe or singularity [prompt on "singularity", do not accept "ultraviolet" singularity]

19. The hydrophobic motif for this AGC kinase is FPQFSY. All the FOXO transcription factors are phosphorylated by this kinase in response to insulin or growth factor stimulation. After this kinase phosphorylates a certain protein, that protein is released from a complex with Bcl-2 and Bcl-xL and complexes with 14-3-3 proteins in the cytosol; that protein is BAD. This kinase's two regulatory phosphorylation sites are residues T308 and S473, which are acted on by PDK1 and mTORC2, respectively. Although not PKC, it contains a pleckstrin homology domain, so it can bind to PIP3, which is formed by the phosphorylation of PIP2 by PI3K. For 10 points, identify this serine/threonine kinase also known as protein kinase B.

ANSWER: **Akt**/PKB kinase [or **RAC**-alpha serine/threonine-protein kinase; or Akt/**PKB** kinase or Akt/**protein kinase B** kinase until "protein kinase B" is read]

20. As a soldier, this man gained distinction for riding through enemy lines to inform Blucher and Bernadotte of their orders to join the Battle of Leipzig, and at the Battle of Tolentino, he led the cavalry charge that scattered Murat's bodyguard. This man's notable writings include *A Few Words on Horse Racing*, advocating for the sport, as well as a trilogy consisting of the works *Credit*, *Light*, and *Stadium* which promulgated his liberal views. This man condemned what he saw as the radicalism of his countrymen in his *Fragments of a Political Program*, and he served as a communications minister in the government of

Lajos Batthyany, though he quit that government during the 1848 revolution after suffering a nervous breakdown. This man's legacy of internal improvements includes support for the first bridge between the cities of Buda and Pest, which is named in his honor. Called "the greatest of the Magyars," by his political antagonist Lajos Kossuth, for 10 points, identify this Hungarian liberal reformer.

ANSWER: Istvan **Szechenyi** de Sarvar-Felsovidek

1. Le Corbusier's Unite d'Habitation influenced this style of architecture, which took its name from the French for "raw concrete." For 10 points each:

[10] Name this modernist architectural style exemplified by Boston City Hall and London's Trellick Tower, notorious for being remarkably ugly.

ANSWER: **Brutalism**

[10] This English architectural power couple coined the term "Brutalism," besmirching the last name they share with the sculptor of *Heap of Language* and *Yucatan Mirror Displacements*.

ANSWER: Alison and Peter **Smithson**

[10] Another sorta-kinda example of Brutalism was the design of the garden apartments at Ham Common by this British architect. He won the 1981 Pritzker on the strength of designs like the Engineering Building at Leicester and the Cambridge University History Building.

ANSWER: James **Stirling**

2. The formulator of this philosophy based it on five principles: nationalism, humanism, democracy, social prosperity, and belief in one god. For 10 points each:

[10] Identify this central philosophy of the newly-independent Indonesian state, articulated by Sukarno on June 1, 1945.

ANSWER: **Pancasila**

[10] Because Pancasila did not grant any special status to Islam, it proved unacceptable to this governor of the Aceh province, who led the Darul Islam rebellion against the central government in an attempt to institute Islamic law in Aceh.

ANSWER: Daud **Beureueh**

[10] The establishment of Pancasila as the official state philosophy was a central feature of this Sukarno policy, which entailed a return to the constitution of 1945 and, naturally, a suppression of all dissidents by his general, Abdul Nasution.

ANSWER: **guided democracy**

3. To accomplish his great deeds, this hero asks his mother Tahmina for a horse with steel hooves, the power of an elephant, and the fleetness of a bird. For 10 points each:

[10] Identify this hero, who is slain by trickery after he spares a much older knight in combat; later, that knight stabs him with a concealed dagger while they wrestle.

ANSWER: **Sohrab**

[10] The legend of Sohrab and his killing by his father Rustam, who is unaware of the identity of the warrior he is facing, is told in this Persian epic written by Firdawsi.

ANSWER: **Shah-nameh** or the **Book of Kings**

[10] A large section of the *Shah-nameh* is concerned with the story of this legendary king, the son of Siyavosh and grandson of Afrasiyab, who had Siyavosh murdered.

ANSWER: **Kai Khosrow**

4. In the preface to this work, the author traces his fascination with the title region to a piece of mylodon hair given to his grandmother by Charley Milward. For 10 points each:

[10] Identify this piece of travel writing, which mixes historical sketches, personal observation, and fiction to chronicle the author's trip through the title region of Argentina.

ANSWER: **In Patagonia**

[10] This British writer, who wrote a fictionalized but historically based account of the life of Brazilian slave

trader Felix Francisco de Souza titled *The Viceroy of Ouidah*, also wrote *In Patagonia*.

ANSWER: Charles Bruce **Chatwin**

[10] Chatwin's book *The Songlines*, about Australian aborigines, describes how according to aboriginal myth the world was sung into existence during this prehistorical period.

ANSWER: the **Dreamtime**

5. Michael Lorenz and Gerald Fink showed that the two key enzymes necessary for this pathway are upregulated in *C. albicans* in response to phagocytosis by macrophages and neutrophils. For 10 points each:

[10] Identify this pathway that allows bacteria, fungi, and plants to subsist on acetate because it bypasses the decarboxylation steps of the citric acid cycle. In plants, it takes place in a specialized peroxisome.

ANSWER: **glyoxylate** cycle

[10] In the glyoxylate cycle, this enzyme cleaves its namesake substrate into succinate and glyoxylate, which then reacts with acetyl-CoA to form malate, as catalyzed by malate synthase.

ANSWER: **isocitrate lyase**

[10] Both malate synthase and citrate synthase catalyze this type of reaction between acetyl-CoA and glyoxylate and oxaloacetate, respectively. In organic chemistry, this reaction is the base-promoted formation of beta-ketoesters from two esters with alpha hydrogens.

ANSWER: **Claisen** condensation [or **aldol** condensation; prompt on **condensation** reaction]

6. According to its formulator, this concept was characterized by a "dual revolution" in British industry and French politics. For 10 points each:

[10] Identify this term used by its formulator to refer to the time period between the French Revolution and the start of World War I.

ANSWER: the **long nineteenth century** [prompt on partial answers]

[10] The term "long nineteenth century" was coined by this British Marxist historian, who chronicled it in a trilogy that began with *The Age of Revolution* and ended with *The Age of Empire*.

ANSWER: Eric John Ernest **Hobsbawm**

[10] This book is the middle of Hobsbawm's "long nineteenth century" trilogy and focuses on the economic transformation wrought by the Industrial Revolution.

ANSWER: The **Age of Capital**

7. The preface to this book begins with the observation that in the mid-70s, the author's "patience with most mainstream philosophy had run out," and asks "is it possible that we could have one grand unified theory of the mind-brain?" For 10 points each:

[10] Identify this philosophical book, whose seventh chapter argues for a "reduction of mental states... to neuronal states."

ANSWER: **Neurophilosophy**

[10] This bestest philosopher, a noted eliminativist and co-author of "Stalking the Wild Epistemic Engine" with her husband Paul, wrote *Neurophilosophy*.

ANSWER: **Patricia Churchland**

[10] The ninth chapter of *Neurophilosophy* lays the smackdown on adherents of this philosophical doctrine, who hold that mental states are defined in terms of their abstract causal roles. Multiple realizability is a sub-category of this philosophical view.

ANSWER: **functionalism**

8. This theory predicts that the substitution rate and mutation rate are the same for the mutations it's concerned with. For 10 points each:



[10] Identify this theory which states that most genetic variation at the molecular level does not affect fitness. It was proposed by Motoo Kimura.

ANSWER: **neutral** theory of molecular evolution

[10] In James Crow's obituary of Motoo Kimura, he relates a story of Kimura hand-copying "Evolution in Mendelian Populations", an influential paper by this biologist. He basically founded population genetics with RA Fisher and JBS Haldane.

ANSWER: Sewall **Wright**

[10] Kimura first rose to prominence by applying diffusion theory to population genetics, including using this equation to derive the probability of fixation of mutant genes in a population when the mean and variance of the rate of change of initial gene frequency is known.

ANSWER: **Kolmogorov backward** equation [or **backward Kolmogorov** equation; prompt on **Kolmogorov** equation; do not accept "Fokker-Planck equation" or "Kolmogorov forward equation"]

9. This kingdom's capital was Washukanni. FTPE,

[10] Name this Ancient Near Eastern Empire, noted for its rivalry with the Hittites, Assyrians, and Egyptians.

ANSWER: **Mittani**

[10] The main language of the Mittani empire was Hurrian, though strange features in Hurrian appear to be the result of a Mittani ruling elite who spoke an Indo-European language. If so, that is an example of this linguistic phenomenon, where a new or elite language influences an older or less prestigious language.

ANSWER: **superstratum** [prompt on **adstratum**]

[10] The Hurrian language is closely related to the language of this empire, located in modern-day Armenia, which was famously conquered by Tiglath-Pileser III.

ANSWER: **Urartu**

10. According to Susan Sontag, this writer's *A Book of Memories* was "the greatest novel written in our time, and one of the great books of the century." For 10 points each:

[10] Identify this author whose latest novel, *Parallel Stories*, begins with the fall of the Berlin Wall and encompasses most of post-war European history.

ANSWER: Peter **Nadas**

[10] This countryman of Peter Nadas wrote of Georgy Korin, who finds an unknown manuscript and is overwhelmed by its beauty, in his novel *War and War*, and Mrs. Eszter's scheming to get herself appointed head of the town committee on moral renewal in *The Melancholy of Resistance*.

ANSWER: Laszlo **Krasznahorkai**

[10] Sure, whatever, they're Hungarian, just like this author of *Fatelessness* and *Kaddish for a Child Not Born*.

ANSWER: Imre **Kertesz**

11. According to Mordell's theorem, if one of these is defined over the rationals, then the set of points on it with rational coordinates is a finitely generated Abelian group. For 10 points each:

[10] Identify these mathematical objects, described by the equation  $y^2 = x^3 + ax^2 + bx + c$ .

ANSWER: **elliptic** curves

[10] Elliptic curves are useful in cryptography because for the group of points on such a curve, this problem, which requires finding an integer  $m$  such that for an element  $h$  in the subgroup generated by  $g$ ,  $h$  equals  $g$  to the  $m$ , is exponential.

ANSWER: **discrete logarithm** problem [prompt on partial answers]

[10] Any elliptic curve can be transformed into a general form named after this mathematician, who also names the general power series definition of the gamma function and a theorem with Stone stating that a continuous function on a closed interval can be arbitrarily closely approximated by a polynomial.

ANSWER: Karl **Weierstrass**

12. This artist used the discovery of the composition of light as the basis for his "Study for Fugue in Two Colors." For 10 points each:

[10] Identify that artist, best known for his geometrical and color paintings such as the aforementioned *Disks of Newton*.

ANSWER: Frantisek **Kupka**

[10] Kupka was an erstwhile member of this artistic movement, which was exemplified by the work of Sonia and Robert Delaunay.

ANSWER: **Orphism**

[10] Kupka's art was mostly non-representational; an exception was his painting *Planes By Colors*, which features a reclining one of these.

ANSWER: female **nude** [prompt on "person" or anything similar; accept synonyms like "naked"]

13. This series of conflicts flared in 1875, and persisted until the 1880s, partially due to the fact that one group participating in them was required to obtain certificates showing its animals were free of scabies. For 10 points each:

[10] Identify this series of conflicts between ranchers and herders over grazing rights near the Texas-New Mexico border.

ANSWER: **Sheep Wars**

[10] In 1884, the prevalence of this practice led the Texas legislature to convene a special session that ultimately made this practice a felony and abolished the open range.

ANSWER: **fence cutting** [accept anything that implies the demolition of barriers or barbed wire]

[10] One of the early clashes in the Sheep Wars took place on the range of this Texas cattleman, who founded the first ranch in the Texas Panhandle in the Palo Duro Canyon and ultimately became one of the greatest ranchers in Texas.

ANSWER: Charles **Goodnight**

14. This term comes from the word for "mixing," and an example is to place sufficient food for two meals less than 2,000 cubits, however much that is, from one's town, thereby creating another "residence." For 10 points each:

[10] Identify this practice, a symbolic act that facilitates the performance of those acts forbidden during Shabbat and other holidays. An example is a symbolic boundary marked by poles, which allows one to carry objects between private and public domains.

ANSWER: **eruv**

[10] Another example of the *eruv* is when a group of families owns one of these things, which one of the families places in their house; this mixes the house and the courtyard and allows one to carry objects between houses.

ANSWER: a loaf of **bread**

[10] A dispute about the number of dishes required to fulfill the cooking *eruv* is one of the many disputes between the *halakhic* school of Bet Shammai, and the school of this rabbi, who, when asked to recite the Torah standing on one leg, recited the Golden Rule, saying "the rest is commentary."

ANSWER: **Hillel**

15. Name these works by Zoltan Kodaly, for 10 points each.

[10] The title character of this work claims to have single-handedly defeated Napoleon, and boasts of other adventures that took him to Vienna, where he met the emperor and encountered a "Viennese musical clock".

ANSWER: **Hary Janos**: *His Adventures from Nagyabony to the Vienna Burg* [**Hary Janos** *kalandozasai Nagyabonytul a Burgvaraig*]

[10] This five-part Kodaly work is influenced by *verbunkos* music, and features a clarinet cadenza. Kodaly considered it a sort of sequel to his piano work *Dances of Marosszek*.

ANSWER: **Dances of Galanta** [**Galantai tancok**]

[10] Kodaly wrote a set of sixteen variations on a Hungarian folk song named after one of these animals. The first of Charles Tomlinson Griffes's *Roman Sketches* is named for a white one of these.

ANSWER: **peacock**

16. In this novel, Norm decides to move the title organization north to Alaska, where it occupies land just upriver from a cabin owned by Sess Harder. For 10 points each:

[10] Identify this novel which centers on the love story between Star and Marco in the title commune.

ANSWER: **Drop City**

[10] *Drop City* was written by this American author, who also wrote a fictionalized account of John Harvey Kellogg, the inventor of corn flakes, titles *The Road to Wellville*.

ANSWER: Tom Coraghessan [or John, apparently] **Boyle**

[10] The deaf teacher Dana Halter is the main character of this T.C. Boyle novel, in which Halter's identity is stolen by Peck Wilson.

ANSWER: **Talk Talk**

17. This work's sixth chapter is titled "Omnia mea mecum porto" and begins with the proclamation that "the old, official Europe that one can see is not asleep - it is dying!" For 10 points each:

[10] Identify this volume of essays dedicated to the author's son Sasha, a series of commentaries on the revolutions of 1848.

ANSWER: **From the Other Shore** or **From Another Shore** or **S togo berega**

[10] *From the Other Shore* is the best-known collection of writings by this Russian thinker, who also wrote a naturalistic novel whose title asks *Who is to Blame?* Probably everyone, really.

ANSWER: Alexander Ivanovich **Herzen**

[10] Alexander Herzen is a major character in this trilogy of Tom Stoppard plays about pre-revolutionary Russia comprising *Voyage*, *Shipwreck*, and *Salvage*.

ANSWER: The **Coast of Utopia**

18. One resident of this location on the Sarayu River returns to it after serving two years in prison for forgery, and fumbles his way into showing around tourists who stop over in this location. For 10 points each:

[10] Identify this town, home of "Railway" Raju in *The Guide* and Margayya, the titular protagonist of *The Financial Expert*.

ANSWER: **Malgudi**

[10] Malgudi and its various characters were created by this Indian writer, the author of *Swami and Friends* and *Bachelor of the Arts*.

ANSWER: Rasipuram Krishnaswami **Narayan**

[10] This Narayan novel which completes the trilogy begun by the two just-mentioned novels tells of the sorrow of Krishna, the title character, after the death of his wife Susila, and his attempts to communicate with her through a medium.

ANSWER: The **English Teacher**

19. This ruler made a pact with Hardecanute that whichever one of them lived the longest would become king of both Norway and Denmark. For 10 points each:

[10] Identify this son of Olaf II, who briefly ruled a unified Norway and Denmark from 1042 to 1047 after Hardecanute's death.

ANSWER: **Magnus I** Olafsson or **Magnus the Good** or **Magnus den Gode**

[10] Magnus appointed this man as his Danish viceroy, but while Magnus was out crushing the Wends, this dude decided to revolt and won independence for Norway after making a truce with Magnus' successor, Harald Hardraade.

ANSWER: **Sweyn II Estridsen** [do not accept "Sweyn Forkbeard," a different dude; accept either name]

[10] Sweyn II was the primary source for the information about Scandinavia in this medieval chronicler's *Gesta Hammaburgensis*.

ANSWER: **Adam of Bremen**

20. This phenomenon relies on averaging a large number of statistically small distortions and relies for its effect not on a single object but on the large scale structure of the universe. For 10 points each:

[10] Identify this phenomenon useful as a cosmological probe, which does not produce Einstein rings.

ANSWER: **weak** gravitational **lensing**

[10] The typical statistic extracted from a weak lensing experiment is this function, the Fourier transform of the two-point correlation function.

ANSWER: **power spectrum**

[10] Weak lensing introduces a distortion into the power spectrum of this phenomenon, free-streaming photons from the surface of last scattering.

ANSWER: **cosmic microwave background** radiation