1. The victor of this battle had to be restrained from killing his own son, who showed up with his 38,000 troops shortly after the battle's conclusion. The Red Devils of Ii Naomasa led the initial charge as the morning fog lifted, but the 80,000 man Army of the West successfully repelled them. Around noon, however, the Kobayakawa clan secretly defected to the Army of the East and launched a surprise attack on the southern flank of Ishida Mitsunari's defensive line, turning the tide of this battle. FTP, name this October 21, 1600 battle won by the forces of Tokugawa Ieyasu, paving the way for him to unite Japan and become shogun.
Answer: Battle of Sekigahara
2. This team won five championships in the sixties and seventies, but did not win another until 1993. Since then however they have not gone more than one season between domestic championships. In 1998 a company owned by Rupert Murdoch made an unsuccessful bid of over 1 billion dollars for this team, which promotes itself as the most popular in the world regardless of sport. Winners of the treble of the Champions League, FA Cup, and Priemership in 1999, for ten points name this soccer team featuring players such as Nicky Butt, Fabien Barthez, and David Beckham.
Answer: Manchester United (ACCEPT: Any sort of pejorative name)
3. It begins in Delphi, where Apollo advises the central character that he must travel to Athens. At the steps of Athena's temple, that character pleads to be expiated of a murder. His case is tried by the Athenian citizens, forming the mythical foundation of the Areopagus (AIR - ee - op - ah - gus). FTP, identify this play by Aeschylus, in which Orestes is aquitted of the murder of Clytemnestra, named for the Furies who prosecute him.
Answer: The Eumenides OR The Kindly Ones (or equivalents)
4. This group expelled Duke Henry from Brunswick-Wolfenbuttel and helped restore Duke Ulrich in Wurttemberg after he was deposed by the Swabian League. In 1538 a Catholic League was formed in Nuremberg in response to its existence, this coming seven years after it was founded under the leadership of Phillip of Hesse and John Frederick I of Saxony. Collapsing after its defeat in an eponymous war was sealed at Muhlberg, for ten points name this sixteenth century alliance of German Protestant states against Emperor Charles V.
Answer: Schmalkaldic League or Smalkaldic League
5. In some functional languages programs themselves are in the form of these data structures. In one such language, LISP, operators specifically dealing with these include car, cdr (CUD-er), and const. One can be converted into a queue by only performing insertions in the back and deletions at the front, and one can be converted to a stack by only performing both insertions and deletions at the front. For ten points, name this fundamental data structure consisting of nodes of two parts, one part holding the stored data and the other a pointer to the next node in the chain.
Answer: Linked List
6. Born in Sun Prarie Wisconsin in 1887, her family moved to Williamsburg, Virginia, when she was 15. Her early work was influenced by the Precisionists Charles Sheeler and Charles Demuth, as well as by the photographer Alfred Stieglitz. She married Stieglitz in 1924, and moved to New York. Much of her work was inspired, however, by her winter trips to New Mexico. FTP, identify this artists, known form works like "Cow Skull, Red, White, and Blue", and "Black Iris".
Answer: Georgia O'Keeffe
7. Although born in Dusseldorf, he lived in Paris after 1830. Almost totally paralyzed during the last years of his life, on his deathbed he is said to have claimed "God will pardon me, it is his trade." Known in his time for travelogues like "Trip in the Harz Mountains", and criticism like "On the History of Religion and Philosophy in Germany," he is beter remembered today as a poet. FTP, name this author of "Germany, a Winter Tale", and "Lorelei".
Answer: Heinrich Heine
8. Tourist attractions here include the Wilhelma Zoo, the only combined zoological/botanical garden in Germany, and the heavily French influenced Neuss Schloss or New Palace. Located on the autobahn betweek Karhlsrhue and Munich and centered in the Neckar River valley, this city of 2.5 million sits just north of both the Swabian Alps and the Black Forest. The capital of Baden-Wurtemberg, for ten points name this city, perhaps best known as Germany's major automotive center, the home of Daimler Chrysler and Porsche.

## Answer: Stuttgart

9. Its orginator developed it from the ideas of David Bohm. Proposed in 1964, the most definitive test of it was conducted in 1982 by Aspect, but Franson argued in 1985 that the experimental constraints used left room for "detector" and "light-cone" loopholes; recent experiments have finally been able to close these loopholes and prove that its central inequality is indeed violated. Widely viewed as a triumph for the Copenhagen interpretation of quantum mechanics, this is, FTP, what theorem of QM that proved the assumptions of the EPR paradox to be flawed and showed that local "hidden" variables cannot exist. Answer: Bell's theorem or inequality (or Bell-Wigner)
10. This manager once traded for a pitcher whom he thought had thrown at him one too many times, cut his salary by $2 / 3$, benched him, and eventually forced him into retirement. That glittering personality may be one of the reasons he was fired while in the hospital recovering from brain surgery, despite having led his team to two world championships and baseball's all-time best record. For ten points, name this manager of the Chicago Cubs, third member of the famed Tinker to Evers double-play combination. Answer: Frank Chance
11. It was primarily based on a tale from Barnabe Riche's "Farewell to Military Profession", which was in turn taken from the Italian comedy Gl'ingannati. The main plot turns on the similarity between two shipwrecked siblings who each believe the other to have been lost. Sir Andrew Aguecheek nearly duels with one of the siblings, Cesare, before the arrival of Antonio Prevents it. Sir Toby Belch is the uncle to Olivia, and her suitor Orsino is the duke of Illyria. FTP, name this comedy of Shakespeare, focusing on Sebastian and Viola, named for the eve of Epiphany.
Answer: Twelfth Night
12. When this 19-year old offered thousands of vassals to Abbe Bernard of Clairvaux for use in the Second Crusade, the Church was pleased. It was less happy with her decision to go along on the Crusade and tend the wounded. Because of events in this Crusade, she had her marriage to King Louis VII annulled, and later married Henry of Anjou. For ten points, name this woman, wife of Henry II of England, and the mother of Richard I and John.
Answer: Eleanor of Aquitaine
13. According to legend, the dogs of Harun-al Rashid refused to attack a deer standing on his grave. The second person to recoginize Mohammed as prophet, he did not challenge Abu Bakr and Umar's claims to the caliphate despite some believing Mohammed had selected this man as his successor, only mounting a challenge when the Umayyad Uthman assumed the office. Victorious at the Battle of the Camel, for ten points, name this man, the fourth caliph of Islam, the first imam of Shi'a Islam, and Mohammed's son-in-law, whose tomb in the Iraqi city of An Najaf is a major Shitte holy site.
Answer: Ali
14. The story follows three young men as they run away from their homes in Texas, heading for Mexico. They find work on a ranch owned by Don Hector, and John Grady falls in love with Don's daughter Alejandra. After Blevins kills a townsperson in Encantada, he is executed, while John Grady and Rawlins are imprisoned. These things happen in, for ten points, what novel by Cormac McCarthy?
Answer: All the Pretty Horses
15. Over $\$ 3$ million in back taxes was raised by the sale of facilities in St. Louis, Milwaukee, and Chicago. 238 indictments were handed down, and 110 people were convicted, in a prosecution led by Benjamin Bristow. The unpaid taxes were used to bribe IRS agents and, allegedly, to fund the president's re-election campaign. The most famous of the accused was Oliver Babcock, the president's private secretary. FTP, identify this scandal named for a group of distillers, which plagued the administration of Ulysses Grant.
Answer: Whiskey Ring
16. This compound is a heterodimeric protein, consisting of a 267 -amino acid "A" chain connected to a 262 -amino acid " B " chain by disulfide bridges. The active site depurinates a specific adenine of the 28 s rRNA, causing inactivation of the eukaryotic large ribosomal subunit and preventing protein synthesis. This activity is catalytic, making this compound one of the most potent cytotoxins known, with an oral LD50 of 30 micrograms $/ \mathrm{kg}$. When ingested, it causes intense abdominal pain, vomiting, and bloody diarrhea. FTP, name this incredibly deadly cytotoxin produced naturally by castor beans.
Answer: ricin
17. He was known in later times as a healer of snake and scorpion bites, and in those later times he took an alternate representation consisting of a naked child holding snakes, scorpions, and lions. Also considered to be a god of the blind, he was the god of justice and order, and as such every pharoh reigned as his incarnation on Earth. According to legend he conqured his uncle Seth, gaining revenge for the death of his father Osiris and unifying Egypt in the process. For ten points, name this Egyptian diety who in his best known representation posses a falcon head.

## Answer: Horus

18. In 1957, Milton Friedman published a correction to Keynes' theory of household savings based on maximizing utility over an infinite period. Three years prior to this, however, this man had published a paper which better fit the existing data. He postulated that individuals base their savings calculations only on their own lifetimes, an idea known today as the life-cycle theory of savings. He is also known for two theorems published with Merton Miller, which predict the valuation of publicly held firms based on debt structure. FTP, name the man who won the Nobel Prize for these theories in 1985, an Italian economist and MIT professor.
Answer: Franco Modigliani
19. This show premiered as a low-budget variety program on a local station in Ottawa in 1979, and did not premiere in the United States until 1981. The shows longtime host, Christine McGlade, originally only showed up at her audition to support a friend, but after producer Roger Price told her to either audition or leave, she ended up making the cast. Les Lye played every adult male character; these roles included Senator Prevort, El Capitano, Ross, and of course fast food madman Barth. For ten points, name this staple of Nickelodeon in the 1980's famous for dropping green slime and water when cast members echoed certain code phrases and notable as the vehicle that launched Alanis Morrisette.

## Answer: You Can't Do That On Television

20. Later works of this philosopher include "An Introduction to Metaphysics" and "On the Way to Language." His philosophy was influenced by pre-Socratics such as Parmenides, as he felt that they had uncovered a deeper understanding of existence that was later lost by humanity. He refused to consider himself an existentialist, but his most famous work integrates the existentialism of Kierkegaard and Nietzsche with the phenomenological approach of his teacher Husserl. FTP, name this German philosopher whose reputation has suffered due to his association with the Nazi regime, best known as the author of "Being and Time". Answer: Martin Heidegger
21. A consequence of the conservation of energy, the line integral of any cyclic process with respect to a state energy variable is zero. Alternatively stated, in a cyclic process, the sum of the heat gained or removed by the system and the sum of the work done by or on the system is zero, using proper conventions. FTP, this law states that energy can neither be created nor destroyed.

Answer: First Law of Thermodynamics
22. The title figure of this novel flees the city of Sakiel-Norn with a priestess who has had her tongue cut out. His story is told in another novel of the same name, about a handsome young labor agitator and part-time science fiction author. That book is written by a woman who commits suicide at the beginning of the novel, Laura Chase. Laura's story is told in turn by her sister Iris Griffen. FTP, name this novel, winner of the 2000 Booker Prize, the most recent of Margaret Atwood.

## Answer: The Blind Assasin

23. This document consists of 15 sections, counting the Preamble and Conclusions. It was first proposed by a committee of the Second Continental Congress on July 12, 1776. Finalized by the Third Continental Congress, and proposed to the colonies on November 15, 1777, for ten points, name this document ratified on March 1, 1781, later replaced by the Constitution.
Answer: Articles of Confederation
24. The first isolated example is named "amber," a translation of its discoverer's name; the other two are referred to as "ochre" and "opal." Some species of ciliates, including Paramecium, only have one, however. In eukaryotes, they are recognized by the protein eRF1, but they can be fooled by mutant suppressor tRNA molecules into coding for an amino acid. Occasionally, one will be created due to a point mutation, leading to nonsense expression of the protein. FTP, give the term for the mRNA codons UAG, UAA, and UGA which signal a halt to protein translation.
Answer: stop or termination codon (accept reasonable equivalents)
25. This man once spent 50 million dollars on a can of anchovies. He once found a lucky seven-leaf clover which allowed him to perform a sextuple head spin and join a breakdancing crew, but the clover was later stolen by his brother Yancy. After dropping out of Coney Island Community College, he became a delivery boy for Panucci's Pizza. While making a delivery to Applied Cryogenics on December 31, 1999, he was accidentally frozen for a thousand years. FTP, name this man who now delivers packages for his descendant Professor Farnsworth's company Planet Express on "Futurama."
Answer: Phillip J. Fry
26. Two vertices are in the same block if and only if they belong to a common one of these, while bipartite graphs are characterized by an absence of odd length ones. A chord of one is an edge whose endpoints belong to it while the edge itself does not, and the girth of the graph is the length of the shortest simple one in that graph. For ten points, name this type of graph or subgraph, a path of length at least two beginning and ending at the same vertex and visiting any vertex besides the starting point at most once. Answer: Cycle OR Circuit

Questions by J.P. Lien, Nick Rothfuss, Andrew Ullsperger, and Paul Dynowski

1. Identify Rolling Stone songs from lyrics for ten points each.
A. (10) And I went down to the demonstration, to get my fair share of abuse.

Answer: "You Can't Always Get What You Want"
B. (10) I laid a divorcee in New York City, I had to put up some kind of fight. The lady then she covered me in roses.

Answer: "Honky Tonk Woman"
C. (10) I stuck around in St. Petersburg, when it was a time for a change, killed the czar and his minister, Anastasia screamed in vain.

Answer: $\quad$ "Sympathy For The Devil"
2. Name the following Japanese authors, FTPE:
a. (10) The first Japanese author to win the Nobel Prize, he is known for "Snow Country" and "Thousand Cranes".

Answer: Kawabata Yasunari (either order is acceptable for all three)
b. (10) The most recent to win the Nobel, this author is known for "A Personal Matter".

Answer: Oe Kensaburo
c. (10) A prestigious short-story prize in Japan is named for this author of "Rashomon".

Answer: Akutagawa Ryunosuke
3. Identify the follwing Civil Rights leaders, FTPE
a. (10) The NAACP's field secretary for Mississippi, he was shot and killed by Byron de la Beckwith in 1963.

Answer: Medgar Evers
b. (10) Originally from Trinidata, this man was a member of the Freedom Riders, and the SNCC, and evenrually moved to Guinea and founded the All-African People's Revolutionary Party.

Answer: $\quad$ Stokeley Carmichael or Kwame Toure
c. (10) This cofounder and Defense Minister of the Black Panther Party was convicted of killing a police officer in 1967, and was himself killed in Oakland in 1989.

Answer: Huey Percy Newton
4. Answer the following about antibiotics, given clues, FTPE.
a. [10] This antibiotic was isolated in 1928 by Alexander Fleming.

Answer: penicillin
b. [10] This badass glycopeptide antibiotic of last resort is used in cases where lesser drugs wuss out, especially against resistant staphylococcus infections.

Answer: vancomycin
c. [10] This four-member cyclic amide found in most penicillins and cephalosporins is essential to their antibiotic action. Most resistant bacteria have an enzyme that can break down this structure.

Answer:
beta-lactam
5. Identify the following art groups, FTPE.
a. (10) This group was founded in 1897 by Gustav Klimt. They worked primarily in the Jugendstijl.

Answer: Vienna Secession or Sezession
b. (10) This school of architecture and design was founded by Walter Gropius in Weimar in 1919.

Answer: The Bauhaus
c. (10) These Brits hated academic art so much that they traced it's origin back to a certain Italian artist of the high

Renaissance. They gave us lots of paintings on mythological themes in bright, pretty colors.
Answer: Pre-Raphelite Brotherhood
6. Identify these novels made into recent films, FTPE.
a. (10) This Michael Cunningham novel tells the parallel stories of three different women in different eras. It won the Pulitzer in 1999.

Answer: The Hours
b. (10) This children's book by Louis Sachar tells the story of a child wrongly interned in a labor camp in Texas.

Answer: Holes
c. (10) This Annie Proulx novel is set in a Newfoundland fishing village, where ertswhile journalst Quoyle writes on the titular subject.

Answer: The Shipping News
7. Answer the following questions about an Indian ruler for ten points each.
A. (10) First, name the man who ruled India from roughly 273 to 232 BC who is famous for his promotion of Buddhism, an effort which included sending missionaries as far away as Greece and Egypt.

Answer: Asoka or Ashoka
B. Asoka was the grandson of what man, the founder of the Mauryan dynasty?

Answer: Chandragupta Maurya
C. Asoka's devotion to Buddhism was at least partially due to regret over his bloody conquest of what state around 261 BC?

Answer: Kalinga
8. Identify the following movies, all of which happen to be playing at Champaign's upcoming Ebert festival. a. (10) This film based on a Tom Wolfe book stars Sam Shepherd as Chuck Yaeger, and Ed Harris as John Glenn. Answer: The Right Stuff
b. (10) This 1996 Japanese movie features an accountant who discovers a passion for ballroom dancing.

Answer: Shall We Dance OR Shall We Dansu
c. (10) The festival closes with this 1952 Gene Kelly musical about a pair of silent films stars making their first musical.

Answer: $\quad$ Singing in the Rain
9. Answer the following questions about Ragnarok for ten points each.
A. (10) First, at Ragnarok what god will engage the Midgard Serpent in a violent struggle that results in the death of both of them?

Answer: Thor
B. (10) Next, what son of Odin will kill Fenrir after the giant wolf kills his father? He is one of the handful of Aesir to survive Ragnarok.

Answer: Vidar
C. (10) Finally, the destruction of Ragnarok shall be complete when what denzien of Musspelheim spews fire everwhere with his sword?

Answer: Surt
10. Identify the world mueums, FTPE.
a. (10) This museum is housed in a Medici Palace, and specializes in renaissance masterpieces like "Venus of Urbino", and "Primavera".

## Answer: Uffizi Gallery

b. (10) This mammoth American institution includes the Cooper-Hewett and Hirshorn museums, as well as the Sackler and Freer Galleries.

Answer: Smithsonian Institute
c. (10) The anchor of Chicago's musem campus is this natural history museum, which features "Sue", the world's largest Tyrannosaurus skeleton.

Answer: The Field Museum
11. Given a list of albums, give me the alt-country act that recorded them for FTPE.
A. No Depression, Anodyne

Answer: Uncle Tupelo
B. Car Wheels on a Gravel Road, World Without Tears

Answer: Lucinda Williams
C. The Trinity Sessions, Pale Sun Crescent Moon

Answer: Cowboy Junkies
12. Identify the Persian emperors for ten points each.
A.(10) The first Acheamenid emperor, he captured Media and defeated the Lydians under Croesus.

Answer: Cyrus the Great
B. (10) This emperor's acension was not assured until he defeated Cyrus the Younger at the battle of Cunaxa.

Answer: Artaxerxes II
C. The last emperor of the Acheamenid dynasty, he was killed shortly after his defeat by Alexander the Great at Gaugamela.

Answer: Darius III DO NOT ACCEPT: Darius the Great
13. Answer these questions about making stuff really, really cold, FTPE.
a. [10] This effect named for two scientists, isa consequence of nonideal behavior, and is used to liquefy gases by forcing them at high pressure through a throttling valve at conditions below the inversion point of the gas.

Answer: Joule-Thomson or Joule-Kelvin effect
b. [10] Generally described by the Landau-Tisza "two-fluid" model, helium-4 atoms achieve this macroscopic quantum mechanical state at the "lambda point" of 2.17 Kelvin, and flow with zero apparent viscosity.

Answer: superfluidity or helium-II
c. [10] This technique is used to achieve temperatures in the millikelvin range. A "pill" of a paramagnetic salt of gadolinium or iron is subjected to a strong magnetic field that aligns its magnetic dipoles, leading to a decrease in entropy that results in heat transfer to a helium bath.

Answer: adiabatic demagnetization
14. Nuclear war has produced some fine fiction. Name these examples, FTPE.
a. (10) This is the story of a young girl from Hiroshima who is dying of Lukemia, and her courageous use of Origami.

Answer: Sadako and the Thousand Paper Cranes
b. (10) Not participating in nuclear war won't save you, as the population of Australia finds out in this Nevil Shute novel.

Answer: On the Beach
c. (10) A french woman conducts an affair with a Japanese man in an unfortunate location in this Marguerite Duras play.

Answer: Hiroshima mon Amour OR Hiroshima my Love
15. Composers from Les Six from works, FTPE.
a. (10) "Pacific 231", "The King David"

Answer: Arthur Honneger
b. (10) "The Houseparty", "Dialogues of the Carmelites"

Answer: Francis Poulenc
c. (10) "Incidental music for Agamemnon", "The Creation of the World"

Answer: Darius Milhaud
16. Answer the following about an important analytical technique of chemistry and physics, FTPE.
a. [10] This technique uses an applied magnetic field to create a radio-frequency energy gap between spin states of certain nuclei, which can be measured and used to interpret the composition or structure of a sample.

Answer: Nuclear Magnetic Resonance spectroscopy
b. [10] This compound is usually used as a reference compound in proton and carbon-13 NMR, as it has a chemical shift upfield of most functional groups, and its 12 equivalent protons produce a sharp single peak.

Answer: $\quad$ TMS or tetramethylsilane
c. [10] This effect is commonly used in NMR spectroscopy of macromolecules, particularly to determine stereochemistry. It occurs when nuclei are close enough to produce a dipole-dipole coupling, but there is no Jcoupling.

Answer: Nuclear Overhauser Effect or NOESY
17. Answer the following questions relating to Passover 5-10-20-30.
A. First, what historical event does Passover commemerate?

Answer: The Exodus from Egypt (Accept reasonable equivalents)
B. Next, what term is given to anything containing leaven or anything that has come in contact with something containing leaven? During Passover Jews must not only avoid contact with such items, they cannot even have them in their house.

Answer: Chametz
C. Now, what is the name of the special meal held on the first night of Passover?

Answer: Sedar
D. Finally, this is the book read at a sedar.

Answer: Haggadah
18. Identify the following authors with a continent in common, FTPE.
a. (10) This South African is known for "Ah But Your Land is Beautiful", and "Cry, the Beloved Country".

Answer: Alan Paton
b. (10) This Egyptian Nobel Laureate is known principally for his "Cairo Trilogy".

Answer: Naguib Mahfouz
c. (10) This Nigerian poet and playwright won the Nobel Prize in 1986.

Answer: Wole Soyinka
19. Answer the following from Aztec mythology, FPTE.
[10] According to one myth, this god was tricked into getting drunk and committing incest with his sister; he exiled himself, but promised to return in the year One Reed. This led to an unfortunate bit of confusion in 1519.

Answer: Quetzalcoatl
[10] With a name meaning "blue hummingbird on the left," this is the god of the sun and war with an insatiable hunger for human hearts.

Answer: Huitzilopochtli (wee-tsee-loh-poch'-tlee)
[10] This is the name for the primary Aztec underworld meant for those who died a "normal" death. Those who were sent there had to undertake a difficult four-year journey, but were accompanied by a guide dog.

Answer: Mictlan
20. Name the classical authors, FTPE.
a. (10) This Greek is the author of the lost "Historical Scetches", and the extant 17 -volume "Geography". Although he spent much of his life in Rome, his work is not mentioned by any of his Roman contemporaries.

Answer:

## Strabo

b. (10) This Roman is known for odes like the "Carmen Seculare", as well as the "Ars Poetica".

Answer: Horace
c. (10) This Boeotean (Bee-oh-tion) is known for odes celebrating the victors at the great Greek games. His signature line, from Olympian 1 is "Water is best."

## Answer: Pindar

21. Identify the royal house, FTPE.
a. (10) Members of this line ruled the Piedmont from the 11th century, as well as Sicily and Sardinia from the early 1700s. Four of them ruled all of Italy from 1861-1946.

Answer: House of Savoy
b. (10) Descended from Henri of Navarre, They ruled France until 1792, and for 16 years in the 19th Century. Answer: House of Bourbon
c. (10) This Swabian house produced Holy Roman Emporers from 1138-1254, including Conrad III and Frederick Barbarossa.

## Answer: Hohenstaufen

22. Identify the data compression schemes for ten points each.
A. (10) In one version of this scheme, four or more consecutive bytes with the same value are replaced by a marker byte and a byte giving the number of repititions.

Answer: Run Length Coding
B. (10) Next, this scheme generates a prefix-free code by building up a binary tree in a manner such that less frequently occuring characters are found deeper in the tree and hence have a longer code then more frequently occuring ones. It has been proven to be optimal.

Answer: Huffman Coding
C. (10) This scheme, which like Huffman coding is based upon character frequencies, encodes a string as a real number between 0 and 1 .

Answer: Arithmetic Coding
23. Answer these questions about the last emperor of China, FTPE.
[10] Only 2 years old when he was named emperor by the dying Dowager Empress in 1908, he was forced to renounce his throne four years later as rebellion swept the country.

Answer: $\quad$ Henry Pu Yi or Hsuan Tung
[10] After a century of decline and foreign domination, this last Chinese dynasty fell in 1912 when Pu Yi abdicated.
Answer: Qing or Ch'ing or Manchu
[10] In 1931, the Japanese made Pu Yi the emperor of this puppet state created by their occupation of northeastern China; unsurprisingly, only Japan, Germany, and Italy ever extended diplomatic relations to it.

## Answer: Manchukuo

24. Answer the following about a certain astronomical catalogue, FTSNOP.
a. [10] This catalogue named for the man who funded it was originally published in nine volumes from 1918-1924.

It currently contains over a quarter of a million stars.
Answer: $\quad$ HD or Henry Draper Catalogue
b. [5,5] For FPE, give the two astronomers who put together the original Henry Draper Catalogue.

Answer: Annie Jump Cannon and Edward Pickering
c. [10] The catalogue uses this system of seven letters to assign a spectral class to stars, which is now often remembered using a variety of mnemonics. Give either the boring official name for this system or the seven letters in order from hottest to coolest spectrum.

Answer: Harvard Spectral Classification System or OBAFGKM (Oh Be A Fine Girl, Kiss Me,)
25. Given one or more rivers, tell me what lake or sea they flow into 5-10-20-30.
A. Amu Darya, Syr Darya

Answer: Aral Sea
B. Jordan

Answer: Dead Sea
C. St. Mary's, Saginaw

Answer: Lake Huron
D. Niagara

Answer: Lake Ontario

