

Valencia Delta Burke Invitational 2004—Round 13

Questions by CB with Math by Raj and Science by Elissa and Some Assorted Other Help

1. His namesake hounds are unbaptized souls disguised as geese, doomed to wander the earth until Judgment Day. The only angel who can speak both Syrian and Chaldee, he appeared in the Talmud as the destroyer of Sennacherib's armies as well as the one of the angels who buried Moses. Muslims revere him as the spirit of truth as he delivered the Koran to Muhammad. FTP name this archangel who appeared to the Virgin Mary.

A. Gabriel

2. While living on her mother's family farm in Milledgeville, Georgia, this author raised peafowl, a bird that figures prominently in some of her stories. A Catholic, her observations about her more evangelical neighbors inform her two novels, *Wiseblood* and *Everything That Rises Must Converge*, and her better-known short stories, like "The Life You Save May Be Your Own" and "Good Country People." FTP name this lupus-stricken author probably best known for the story "A Good Man Is Hard to Find."

A. Flannery O'Connor

3. Coenzyme Q does it to succinate in Complex II, and then the bc₁ complex does it to coenzyme Q. It occurs at the anode in electrochemistry, and common reagents used are pyridinium chlorochromate, osmium tetroxide, permanganate, and chromate. From methanol, this process produces first formaldehyde and then formic acid, since in organic chemistry it is roughly equivalent to removing hydrogen or adding oxygen. FTP, name this process in which electrons are removed from a molecule, the counterpart of reduction.

A. oxidation or oxidizing

4. The sitter for this painting was Jonathan Buttall, a friend of the artist, and in the painting the title figure stands in front of a lightly wooded background with left foot slightly forward and left arm akimbo. In his right hand is a black hat with a white plume. An homage to Van Dyck, FTP name this perhaps most famous work of Thomas Gainsborough titled for the color of the titular figure's elaborate outfit.

A. *The Blue Boy*

5. Pencil and paper ready. Vector B has a magnitude of 10 units, and it is perpendicular to vector A. If vector $A = 3i - 4j$, then, FTP, find either of the two possible equations for vector B. You have 10 seconds.

A. $8i + 6j$ or $-8i - 6j$

6. One of its central tenets is that it is to a nation's disadvantage to export raw or unfinished goods, as greater wealth is derived from doing value-added manufacturing work, which explains why Great Britain refused to export cloth to the Netherlands in the 18th century. It also presupposes that precious metals are synonymous with wealth and that nations are in a zero-sum competition for economic success. Largely discredited by Adam Smith's *Wealth of Nations*, FTP what was this 17th and 18th century economic theory that helped fuel exploration and colonialism?

A. mercantilism

7. Jason Jones referred to it as being like its predecessor "on fire, going 130 miles per hour through a hospital zone, being chased by helicopters and ninjas ... And, the ninjas are all on fire, too." One retailer sold 200,000 copies of it by daybreak on Tuesday, and 1.5 million copies of it were pre-ordered. FTP, name this X-box game released by Microsoft this week, a sequel which reached nearly \$100 million in sales in one day.

Answer: Halo 2 (do not accept "Halo")

8. In 1579 he dedicated his first published poem, a pastoral called The Shepherd's Calendar, to Philip Sidney. A sort of sequel to that work was 1595's Colin Clout's Come Home Again. However, he's best known for an epic poem dedicated to Elizabeth I that features characters like the Red Crosse Knight and Glorianna, the title character. FTP name this author of The Faerie Queen.

A. Edmund Spenser

9. In its first appearance, its coiner was specifically attacking those who didn't think Texas should be granted statehood, a group that included many Northern abolitionists. This appeal came in a July, 1845, editorial in *United States Magazine and Democratic Review* by John L. O'Sullivan. O'Sullivan defined it as our right to "overspread the Continent allotted by Providence for the free development of our yearly multiplying millions." A treasured concept for nearly a century, FTP what two-word phrase did O'Sullivan create to refer to American's divine right to control land west to the Pacific?

A. manifest destiny

10. There is a propeller twist of about 16 degrees, and one turn has a length of 3.4 nanometers. The Z-form is left-handed, and may occur in vivo when it is methylated, and the A form is shorter and fatter with a reduced major groove, while the B form is the one found in cells and portrayed in the famous X-ray crystallograph by Franklin. The strands are antiparallel and can only be extended in the five prime to three prime direction. FTP, name this genetic material studied by Watson and Crick.

A. DNA or deoxyribonucleic acid

11. In one version of the myth, this figure's mother, Chimalman delivered him in four days of grueling labor after Mixcoatl (mix-koh-ahtull) chose to sleep with her rather than kill her. He created mankind by taking bones from the underworld and sprinkling his blood on them. Usually opposed to Tezcatlipoca, the latter drove him across the sea, and the legend was that he would someday return to rule, leading to some confusion for the Aztecs when Hernando Cortes appeared. FTP name this feathered serpent, the primary god of Aztec myth.

A. Quetzalcoatl

12. This city was officially founded when Spain's Carlos III signed a charter allowing it to be built to replace the original capital, destroyed by a 1773 earthquake. Located in the south of its namesake nation, it is divided into 15 zonas, centered on the Plaza Mayor, which is surrounded by the Palacio Nacional and the Catedral Metropolitano. The largest city in Central America, FTP name this capital of Guatemala.

A. Guatemala City

13. This non-fiction work explores the 17-year period beginning in 1914 when its author, a baroness, had just married her Swedish cousin and moved to a plantation at the foot of the Ngong Hills. She divorced him after seven years when he gave her syphilis and after that ran the coffee plantation herself. The work was criticized by the Kenyan author Ngugi for its condescending and racist comments about her Masai and Kikuyu neighbors, but that didn't keep it from being adapted for a 1985 movie starring Meryl Streep. FTP name this work by Karen Blixen under the pen name Isak Dinesen.

A. Out of Africa

14. Their use by foreign powers is governed by treaties called capitulations, and Francis I used 120,000 of them at the Battle of Pavia. Perhaps their most famous moment came in their defense of the Tuileries Palace from the mob during the French Revolution, an action memorialized by the Lion of Lucerne statue in the namesake city. In 1874 their government forbade the use of these mercenaries by foreign powers, with one symbolic exception. FTP name these soldiers commonly seen now in uniforms designed by Michelangelo, who guard serve as the ceremonial personal guard of the pope.

A. Swiss Guards

15. First performed in 1942, the western folk song "I Ride an Old Paint" provides a background motif throughout. Other tunes in it include Corral Nocturne and Buckaroo Holiday. However, this ballet choreographed by Agnes DeMille might be best known for its famous tune "Hoedown," recently used in commercials by the Beef Industry. FTP name this ballet by Aaron Copland focusing on a cowboy competition.

A. Rodeo

16. Evidence for one consequence of this theory, frame dragging, was found by x-ray satellites in 1997. Another consequence of the theory was verified in Sobral, Brazil, during a 1919 eclipse, as light rays from a star were bent by the mass of the sun. Yet another consequence, found by Karl Schwarzschild in 1916, is the possibility of a black hole. FTP, name this 1915 theory of gravitation developed by Albert Einstein.

Answer: theory of general relativity

17. He first came to fame in 1749 with his Discourse on the Arts and Sciences, the idea of which came to him in an ecstatic episode while en route to visit Diderot who was being held in the Vincennes prison. He explained his Deism in a chapter called "Confession of Faith of a Savoyard Vicar" in his well-known explanation of education, Emile. FTP name this author best known for Confessions and The Social Contract.

A. Jean Jacques Rousseau

18. The "people on the pavement" believed "he was everything to make us wish [they] were in his place." They are later described as "[waiting] for the light, and "[going] without the meat, and [cursing] the bread," contrasting with the title character who "glittered when he walked." FTP name this Edwin Arlington Robinson poem about a rich man who nonetheless goes home and "[puts] a bullet through his head."

A. "Richard Cory"

19. Its introns are much shorter than those of other vertebrates for unknown reasons. It has no ribs or pelvis. Tetrodotoxin, which is responsible for its toxicity, is produced by symbiotic bacteria, and concentrated in the skin, liver and ovaries. Poisonings, however, which cause numbness and paralysis, only occur when it is improperly prepared, because other parts are edible. FTP, name this fish which causes about 20 deaths a year in Japan.

A. Fugu or pufferfish

20. The senate investigations into this scandal were led by Senator Thomas Walsh and one result was a \$100,000 fine levied against Edward Doheny, who had offered no-interest loans to a cabinet member in return for a no-contract bid on one of the locations in question. Harry Sinclair was also fined \$100,000 for his no-contract bid on the oil field at the location that names the scandal. Involving the leasing of Elk Hills and the title spot in Wyoming, FTP this is what scandal under Harding that led to the resignation of Interior Secretary Albert Fall?

A. Teapot Dome

Valencia Delta Burke Invitational 2004—Round 13 Bonuses

1. FTP each find the following bout rational functions:

A. Find one of the two vertical asymptotes for the rational function

$$f(x) = 1 / (x^2 + x - 2);$$

Answer: $x = 1$ or $x = -2$

B. Find horizontal asymptote for the rational function

$$f(x) = 3x^2 / (2x^2 + x + 1);$$

Answer: $y = 3/2$

C. Find the diagonal asymptote for the rational function

$$f(x) = (x^2 + 1) / x$$

Answer: $y = x - 1$

2. ID these works by Fyodor Dostoevsky FTPE.

A. This work's title character is Prince Myshkin, whose innocence and naivete get him sent to a sanitarium.

A. *The Idiot*

B. In this novel Raskolnikov is pursued by Porfiry Petrovich.

A. *Crime and Punishment*

C. Written in 1846, this was Dostoevsky's first novel, focusing on Russia's hard rural life.

A. *Poor Folk*

3. Stuff about an important 1930s New Deal organization FTPE.

A. This entity was conceived by Nebraska senator George Norris to develop and utilize the area around the namesake river and was officially established in 1933.

A. Tennessee Valley Authority (acc. TVA)

B. At this area in Alabama the Tennessee River drops 137 feet in just 37 miles, so a dam there was finished by the TVA to harness its massive potential for hydroelectric power.

A. Muscle Shoals

C. It was at this TVA-powered facility that the US government built the center for atomic research at which much development of the A-bomb took place.

A. Oak Ridge

4. ID the Italian painters of the following FTPE.

A. *The Venus of Urbino*

A. Titian

B. *Madonna of the Long Neck*

A. Parmagianino

C. *The Conversion of St. Paul*

A. Caravaggio

5. Name these Franks FTPE.

A. This founder of the Merovingian Dynasty was the first king of the Franks.

A. Clovis I

B. This Mayor of the Palace crushed and Islamic army at Tours in 732.

A. Charles Martel

C. This son of Charles Martel sent the last Merovingian king into a cloister and named himself king of the Franks.

A. Pepin III (acc. Pepin the Short)

6. Here's some low-temperature physics that isn't about superconductors 5-5-10-10.
- A. (5) In 1908, Kamerlingh Onnes first liquefied this gas, which boils at 4.2 K.
A. helium
- B. (5) He found that liquid helium has this property, flowing with no resistance at all.
A. superfluidity
- C. (10) The temperature at which helium becomes superfluid, 2.17 K, is known as this point.
A. lambda point
- D. (10) Helium-4 can become superfluid because its nucleus is this kind of particle with integer spin.
A. boson
7. Name these terms related to inflation given a description FTPE.
- A. This type occurs when overall demand exceeds supply.
A. Demand-Pull Inflation
- B. This is inflation of more than 50% in one month.
A. Hyperinflation
- C. This is a fall in the general level of prices, the reverse of inflation.
A. Deflation
8. See what you remember about reading *The Catcher in the Rye* back in high school FTPE.
- A. This is the novel's narrator and protagonist.
A. Holden Caulfield
- B. Holden attacks his roommate Stradlater because he fears he attempted to seduce this girl, whom Holden used to date and still admires.
A. Jane Gallagher
- C. Holden annoys a couple different cab drivers by asking them where these creatures who live in Central Park go during the winter.
A. ducks
9. ID these rivers from cities which lie on their banks FTPE.
- | | |
|------------------------------------|----------------------|
| A. Matamoros, El Paso, Albuquerque | A. <u>Rio Grande</u> |
| B. Tours, Nantes, Orleans | A. <u>Loire</u> |
| C. Bamako, Timbuktu, Niamey | A. <u>Niger</u> |
10. Stuff about a certain goddess 5-10-15.
- A. (5 pts.) She is the wife and sister of Zeus.
A. Hera
- B. (10 pts.) This bird, two of which pulled her chariot, was sacred to Hera.
A. peacock
- C. (10 pts.) Each year Hera bathed in the well at Canathus and regained this quality, which must have pleased Zeus no end.
A. virginity (acc. equivalents, whatever they may be)
11. Name the instrument primarily played by these jazz giants FTPE.
- | | |
|--------------------|------------------------------------|
| A. Thelonius Monk | A. <u>piano</u> |
| B. Lionel Hampton | A. <u>viraphone</u> (acc. vibes) |
| C. Dizzy Gillespie | A. <u>trumpet</u> or <u>cornet</u> |

12. Identify these vitamins from their deficiency disease for 10 or from their name for 5.

A. (10) beriberi

(5) thiamin

A. B1

B. (10) pellagra

(5) niacin

A. B3

C. (10) pernicious anemia

(5) cyanocobalamin

A. B12

13. Given two characters, name the Shakespeare play in which they appear FTPE.

A. Rosalind and Touchstone

A. As You Like It

B. Mistress Ford and Bardolph

A. The Merry Wives of Windsor

C. Leontes and Perdita

A. A Winter's Tale

14. Highlights of the Civil Rights movement FTPE.

A. One of the earliest events in the movement was the 1955-56 bus boycott in this Alabama city.

A. Montgomery

B. Marchers on the Edmund Pettis Bridge were attacked by police near this other Alabama city in 1965.

A. Selma

C. Four men staged a famous sit-in at a Woolworth's lunch counter in this North Carolina town on February 1, 1960.

A. Greensboro

15. Answer the following about the pilgrimage to Mecca FTPE.

A. First, what is its arabic name?

A. Haj

B. Worshippers circle this small, black building seven times in an act known as tawaf.

A. Ka'aba

C. Most fatalities during the Haj occur during this ritual in Mina in which Hajis throw stones at three pillars representing this figure.

A. devil (acc. reasonable equivalents)

16. Evolution stuff FSNOP.

A. This term refers to the random variation of allele frequencies between generations in a population; it results from sampling error, and need not be adaptive.

A. genetic drift

B. This type of genetic drift occurs when a bottleneck of individuals gives rise to a population, so that unusual characters carried by the progenitors become common, for example, Huntington's disease in the Lake Maracaibo population.

A. founder effect

C. This term describes a situation when two species reciprocally affect each other's evolution, for example, plants and their pollinators.

A. coevolution

17. Stuff about one of your TD's favorite authors FTPE.

A. What American has written the novels *Roger's Version*, *The Witches of Eastwick*, and a tetralogy about a former high-school basketball player turned auto dealer?

A. John Updike

B. Updike's best-known short story to college students might be this ubiquitously anthologized tale about Sammy who quits his job at the titular grocery store.

A. "A&P"

C. The main character of Updike's Rabbit stories is this man.

A. Harry Angstrom

18. Give the term from anthropology for 15 points each.

A. This is the change of cultural features that results when groups come into continuous firsthand contact; the original cultural patterns of either or both groups may be altered, but the groups remain distinct.

A. Acculturation

B. This is the process of change that a minority group may experience when it moves to a country where another culture dominates; the minority is incorporated into the dominant culture to the point that it no longer exists as a separate cultural unit.

A. Assimilation

19. Stuff about a dude FTPE.

A. This member of the Young Turks helped seize power in from the last Ottoman sultan in 1908 and in 1923 became the first president of Turkey.

A. Mustafa Kemal Ataturk

B. During WWI Ataturk led Ottoman forces at this disastrous landing attempt by the Allies on the Turkish coast.

A. Gallipoli

C. Ataturk, in his efforts to Westernize Turkey, outlawed the wearing of this traditional hat, now favored by Shriners in the US.

A. fez

20. Identify these white blood cells FTPE.

A. These lymphocytes attack infected or precancerous cells and cause them to lyse. Their name seems a bit melodramatic.

A. natural killer (or NK) cells

B. This large type of white blood cell engulfs foreign bodies, and when they move into the tissues they're known as macrophages.

A. monocyte

C. This neutrally-staining granulocyte is the most abundant type of white blood cell.

A. neutrophil