

Bulldog High School Academic Tournament 2015 (XXIV): It's more than good...it's Grace!

Written by Yale Student Academic Competitions (Isaac Kirk-Davidoff, Laurence Li, Grace Liu, Jacob Mitchell, Frederick Muth, Jacob Reed, Basil Smitham, Jacob Lawrence Wasserman, Nicholas Wawrykow, Mitchell Weldon, Haohang Xu)

Edited by Jacob Reed, with Grace Liu

Packet 6 Tossups

1. **This artist depicted a tightrope walker in a work perversely titled *May the Rope Break!*. He painted a mutilated body in a tree in *This is worse*. One of this artist's engravings depicts a bunch of owl-like monsters attacking a man asleep at his desk. One of his series includes depictions of *Two Old Men Eating Soup*, a *Witches' Sabbath*, and (*) *Saturn Devouring His Sons*. His series include *The Disasters of War*, *Los Caprichos*, and the *Black Paintings*. In this artist's most famous painting, a kneeling man in a white shirt raises his arms in front of a firing squad on the title date. For 10 points, name this Spanish painter of *The Nude Maja* and *The Third of May, 1808*.**

ANSWER: Francisco [José de] Goya [y Lucientes] <JR>

2. **An architect from this country has built several temporary buildings out of cardboard tubes. This country is home to the tallest tower in the world, a "Skytree." This country contains the longest suspension bridge and the longest rail tunnel in the world. The longest (*) airport concourse in the world, designed by Renzo Piano, can be found in this country. One region in this country is located where the Okhotsk Plate meets the Philippine Sea Plate. The Inland Sea separates its largest island from Shikoku and Kyushu. For 10 points, name this nation whose island of Honshu is home to Mt. Fuji.**

ANSWER: Japan [or Nippon; or Nihon] <JM/JR>

3. **This composer ended a set of orchestral songs with a poem that ends "Is this perhaps death?," "Im Abendrot." One of his characters wonders about little "Resi" from the convent and admits that she sometimes stops all the clocks in the middle of the night. An opera by this composer ends with a young black page scurrying off the stage. This composer used three Hesse poems in his *Four* (*) *Last Songs* and wrote a role for a woman who "resolves to love" a young count fully, loving even "his love for another." That sentiment is expressed after Baron Ochs fails to marry Sophie, a girl who sings a trio with Octavian and the Marschallin. For 10 points, name this composer of *Der Rosenkavalier*.**

ANSWER: Richard Strauss [prompt on "Strauss"] <GL>

4. [Note to moderator: please read the gray-highlighted text SLOWLY]

The general ability to do this action separates fields from commutative rings. The ability to always do this action also separates the mathematical set "Q" from "Z." The Euclidean Algorithm gives the largest integer that can be used for this action on two different integers. If you do this action with functions f and g , the derivative of the result is " f prime, g , minus f , g prime, (*) all over g squared." It can be done to polynomials with its "synthetic" type. This action either produces the rationals from the integers or yields a remainder, and you can't do it with zero. For 10 points, name this operation that produces fractions.

ANSWER: division [accept taking a quotient; accept word forms like dividing; accept taking inverses or cancellation before "Euclidean Algorithm; accept any more specific type of division, like synthetic division] <JR>

5. **Several members of this institution were included in a book by John Foxe. One text used by this institution was defended by Richard Hooker and was partly written by Matthew Parker. Another of this institution's texts was started at the Hampton Court Conference in 1604 and was partly designed to replace an earlier one from Geneva. The early development of this institution, which is partly based on the Thirty-Nine (*) Articles,**

was overseen by Thomas Cranmer, who, along with many of its leaders, was martyred by Bloody Mary. For 10 points, name this institution that adopted the Book of Common Prayer and the King James Bible and was formed when Henry VIII broke from the Catholic Church.

ANSWER: the **Church of England** [prompt on “England” or any answer about the English Crown or government; accept any answer with the word “**Anglican**” in it; do **NOT** accept any answer with the word “Episcopalian” in it] <JR>

6. **During the Dirty War, this man was accused of kidnapping Orlando Yorio and Franz Jalics, two priests. This man attacked some of his colleagues by calling them “lords of the manor.” He recently gave an impromptu speech after being overwhelmed by hugging a twelve-year-old girl. He has elected to live in (*) Saint Martha’s House. This man, who has warned of “spiritual Alzheimer’s,” recently led a six-million person Mass in the Philippines. This man, who was the first to have a living predecessor in over 700 years, was also the first Jesuit to hold his current position. For 10 points, name this Argentinian who’s the current pope.**

ANSWER: Pope **Francis** [accept Jorge Mario **Bergoglio**] <NW>

7. **One of these creatures is poked at with a pipe, but was formerly able to “haunt the storm” and laugh at the boatman, much like a poet. A “clumsy, ashamed” one of these creatures drags its appendages “like oars.” That poem about one of these creatures comes between a “Benediction” and an “Elevation” as the second numbered poem in *Les Fleurs du mal*. After harming one of them, a character learns his lesson, saying “He prayeth best, who (*) loveth best all things both great and small.” One of these creatures brings the bad luck of “Water, water, every where, nor any drop to drink” after being shot by the Ancient Mariner in a Coleridge poem. For 10 points, name these gigantic birds.**

ANSWER: **albatrosses** <JR>

8. **In this state, an amphibiously-landed force was stopped in the Bermuda Hundred Campaign, which occurred the same month as the cavalry battle at Yellow Tavern. The engineer Henry Pleasants exploded a mine under enemy lines in this state at the Battle of the Crater. The (*) Overland Campaign in this state included bloody attacks at Cold Harbor and Spotsylvania, while off its coast, an ironclad renamed after this state fought the Union’s *Monitor*. The western counties of this state seceded from it a few months after its Battle of Chancellorsville. For 10 points, name this state where Robert E. Lee both was born and surrendered, home to the Confederate capital, Richmond.**

ANSWER: Commonwealth of **Virginia** <JW>

9. **When these materials have a diameter smaller than their excitons’ Bohr radii, quantum confinement results, and quantum dots are created. In the intrinsic variety of these materials, depletion zones form. Arsenic and phosphorus are commonly used elements in a process used on these devices called (*) doping, and these devices are often made of silicon and germanium. When there are holes instead of electrons these devices are of the *p* type, while the *n* type can be created by adding impurities. For 10 points name these devices that are neither insulators or conductors.**

ANSWER: **semiconductor** <NW>

10. **This poet states that he must lie down “in the foul rag and bone shop of the heart,” in “The Circus Animals’ Desertion,” and he plans to live alone in the “bee-loud glade” in a small cabin of “clay and wattles.” In another poem, this author writes the names of “MacDonagh and MacBride and Connolly and Pearse” before repeating, “a terrible (*) beauty is born.” Besides commenting that “the best lack all conviction and the worst are full of passionate intensity,” this poet states that “the falcon cannot hear the falconer” and describes a rough beast slouching “towards Bethlehem to be born.” For 10 points, identify this Irish poet who wrote “Easter, 1916,” “The Second Coming,” and “Sailing to Byzantium.”**

ANSWER: W.B. Yeats [or William Butler Yeats] <GL>

11. In Zoroastrianism, this event begins with a sky of shining metal, which is defended against the Evil Spirit by Khashathra. The Rainbow Serpent was awakened during this event, called Dreamtime in aboriginal mythology. Hesiod's account of this event claims that Eros arose at the same time as Tartarus and (*) Gaia. Another of these events saw Pan Gu pop an egg open. An account of this event describes vast waters which are separated by a dome on the day after they are given light by God. For 10 points, name this mythical story exemplified by the opening of Genesis.

ANSWER: creation of the world [accept equivalents] <FM>

12. In a novel by this author, an imprisoned king finds an old toy box in a closet and then the door to a secret passage out. That novel by this man consists of a poem beginning "I was the shadow of the waxwing slain," by John Shade, and crazy (*) commentary on it, by Charles Kinbote. In another of his novels, the author of *The Enchanted Hunters* takes a girl to the Duk Duk Ranch. That lascivious playwright, Clare Quilty, is shot by a man who calls the title girl "light of my life, fire of my loins." For 10 points, name this author who created Humbert Humbert and wrote *Pale Fire* and *Lolita*.

ANSWER: Vladimir [Vladimirovich] Nabokov <JR>

13. This instrument plays the first notes of Webern's *Symphony*. Richard Strauss's father, Franz, played and wrote two concerti for it. Richard himself wrote two E-flat major concerti for it and included *twenty* of them in *An Alpine Symphony*. Mozart's four concerti for this instrument were recorded by Dennis Brain, and Mozart included two of them in *A Musical* (*) *Joke*. The modern form of this instrument actually contains two of them, in B-flat and F. Brahms wrote an E-flat-major trio for it, violin, and piano. They can play louder with "bells up," or they can mute the sound and change the pitch by "stopping" with their hand. For 10 points, name this coiled brass instrument.

ANSWER: French horns <JR>

14. This region was the site of the empire of the Garamantes, who may have produced the Uan Muhuggiag "black mummy." Foggara were crucial to the success of sites in this region's Tuat region, near the Tanezrouft. Trade empires in its southwest included Kanem-Bornu. Ibn Battuta described the Taghaza salt mine in this region. Cities like Zinder and Agadez, founded by the (*) Tuareg, were important stops for trade in this region. Much of this region's trade in gold and salt was conducted out of Timbuktu by Berbers. It's not Arabia, but the introduction of camels massively aided trade across this region. For 10 points, name this large desert in North Africa.

ANSWER: the Sahara [or Sahara Desert; as-Sahra' al-Kubra; prompt on "Africa"; prompt on "West Africa"; prompt on "North Africa"; generously prompt on "Sahel"] <JR>

15. One work by this author features a woman who reminisces about Edgar Teagarden and tells Bobby Lee's companion, "Why you're one of my babies." In a story by this author, Carver's mother violently refuses a penny and wears the same hideous purple and green hat as Julian's racist mother. Upon realizing that a plantation with a "secret panel" is actually in Tennessee, one of this author's characters causes a car accident by kicking (*) Pitty Sing's basket. That character "might have been a good woman if there had been somebody there to shoot her every minute of her life" and is killed by "The Misfit." For 10 points, name this Southern Gothic writer of "A Good Man is Hard to Find."

ANSWER: [Mary] Flannery O'Connor <GL>

16. Generic name acceptable. Some of these creatures are found in the family Scombridae. Ancient but extant examples of these creatures are gars. In most of these creatures, an operculum of bone covers five pairs of an

organ that is used for both excretion and gas exchange. These creatures include Actin-opter-ygi-i, which themselves includes Tele-ostei, and form the “superclass” (*) Oste-ich-thyes, which contrasts with Chon-drich-thyes. Their appendages can either have lobes or “rays” of bone. They include a famous “living fossil,” the coelacanth. Many of these creatures have swim bladders. For 10 points, name these sea creatures with bones (as opposed to sharks), gills, and fins.

ANSWER: bony fish [accept osteichthyes, teleosteids or actinopterygiidds until mentioned] <JR>

17. A philosopher from this country called sentences that *do* things “performative utterances.” Another philosopher from this country proved that good does not simply follow from natural properties. Yet another of its philosophers resolved the ambiguity of sentences with non-existent objects, like “The present King of France is bald.” A philosopher from it argued that the external world exists by saying “here is a (*) hand.” A philosopher from this country furthered the logical work of Frege with works like “On Denoting,” and attempted to prove things like God not existing and $1+1=2$. For 10 points, name this country of the authors of *Principia Mathematica*, Alfred North Whitehead and Bertrand Russell.

ANSWER: England [accept United Kingdom, U.K., Britain, etc.; the first two philosophers are J. L. Austin and G. E. Moore] <JR>

18. Any holder of this office was accompanied by 24 lictors. After the Battle of the Allia, Camillus took this office for the third of five times. After the army of Minutius was trapped by the Aequi at Mons Algidus, the Roman Republic elected one of these people, who stepped down after just 16 days and returned to his (*) farm. One holder of this position established his namesake leap year-containing calendar and took it after defeating Pompey. Cincinnatus held this position; Julius Caesar was appointed to it *for life*, prompting his assassination. For 10 points, name this only Roman office above the consulship, appointed in times of emergency.

ANSWER: dictator <FM>

19. In a movie titled for this city, the protagonist shows Maria Callas’s recording of “La Mamma Morta” to his lawyer, who only agreed to represent him after visiting a doctor and seeing him at a law library. In this city, the protagonist of another movie thinks he’s missed 2:22 at the “House of Pass and Stow,” but is told that Daylight Savings Time started after World War I. In a movie titled for it, a gay lawyer who dies of (*) AIDS is played by Tom Hanks. In this city, a child is paid to copy letters from the Silence Dogood Letters, and the main characters find glasses with colored lenses in Independence Hall. For 10 points, name this city where Benjamin Franklin artifacts are found, in *National Treasure*.

ANSWER: Philadelphia <JR>

20. In the “ideal” result of this process, the activity coefficient is equal to one. This process occurs in two endothermic “expansion” steps and an exothermic “combination” step. The extent to which this process has occurred is accounted for by the Van ‘t Hoff factor, *i*. This process is endothermic for ammonium compounds but highly exothermic for compounds like (*) potassium hydroxide. This process happens less due to Le Châtelier’s principle in the common-ion effect. Nonpolar compounds like hydrocarbons do not do this in polar compounds like water. Ionic solids dissociate when they do this. For 10 points, name this process that happens when a solute is put in a solvent.

ANSWER: dissolution in water [accept word forms like dissolve or dissolving; accept solvation and word forms like solvate; accept answers that describe forming a solution; accept dissociation and word forms like dissociate until it is mentioned] <JR>

Tiebreaker

21. During a film, this character’s face morphs out of a soldier submachine-gunning the audience, and one of his speeches is edited by Tillotson to remove any reference to “Withers.” Along with the author of *The Theory*

and Practice of Oligarchal Collectivism, this mustached person founded the ruling Party, and his initials are chanted at the end of the Two (*) Minutes Hate. This enemy of Emmanuel Goldstein, whose face is placed on telescreens and posters, becomes the object of brainwashed adoration after the Ministry of Love tortures Winston Smith. For 10 points, identify this omnipresent totalitarian dictator of Oceania who is “watching you” in George Orwell’s *1984*.

ANSWER: **Big Brother** <GL>

Packet 6 Bonuses

1. Greek sources called this ruler “Ozymandias.” For 10 points each:

[10] Name this nineteenth-dynasty Egyptian pharaoh, who fought in the Battle of Kadesh.

ANSWER: **Ramses II** [or **Ramses the Great**; prompt on just “Ramses”]

[10] Ramses the Great built these gigantic temples in southern Egypt for himself and his consort Nefertari.

ANSWER: **Abu Simbel**

[10] The Battle of Kadesh was fought against the Hittites, who developed the “wrought” variety of *this* technology quite early. The “cast” variety of it was developed in ancient China and really caught on in the Industrial Revolution.

ANSWER: **iron** smelting <JM/JR>

2. This author described a creature that consumes its heart and proclaims, “I like it because it is bitter and because it is my heart.” For 10 points each:

[10] Identify this author who used “the clash and clash of horse and hoof” to evoke “the ride of sin” in his poem “Black riders came from the sea.”

ANSWER: Stephen **Crane**

[10] Crane may be better known for this Civil War novel, in which Henry Fleming is struck by a Union soldier’s rifle butt after he deserts, earning him the title wound.

ANSWER: *The **Red Badge of Courage***

[10] In this Stephen Crane short story, Scratchy Wilson decides not to shoot Marshal Potter after the latter man reveals that he married in San Antonio.

ANSWER: “The **Bride Comes to Yellow Sky**” <GL>

3. Followers of this man emphasized a sort of number-mysticism in which basic arithmetic proportions ruled the universe. For 10 points each:

[10] Name this ancient Greek, who was supposedly the first to call himself a philosopher. He supposedly discovered the basic math of music by listening to some anvils, and his emphasis on “harmony” led his followers to give up meat.

ANSWER: **Pythagoras** of Samos [accept **Pythagoreans** or **Pythagoreanism**]

[10] The Pythagorean’s “religion” included worship of the *tetractys*, which was these four consecutive integers. They partly liked these four numbers because they add up to 10.

ANSWER: **1, 2, 3, and 4** [or “**1** through **4**”]

[10] Pythagorean philosophy was very influential on Plato, including on this theory that was outlined in the *Timaeus*. In this theory, objects in the “real” world of our senses are actually representations of its namesake abstract, perfect Ideas.

ANSWER: the Theory of **Forms** <JR>

4. An uprising in this place started out as more or less a peasant’s revolt but then quickly became a massive conservative counter-revolution. For 10 points each:

[10] Name this coastal region of France, the site of a bloody 1793-96 civil war.

ANSWER: the **Vendée** [accept **War in the Vendée** or **Guerre de Vendée**]

[10] The uprising in the Vendée was put down by this excessively bloody executive governing body of France, which was overthrown in the Thermidorian Reaction. It was led by radical Jacobins like Saint-Just and Danton.

ANSWER: **Committee of Public Safety** [or **Comité de salut public**]

[10] During the Reign of Terror, the Committee of Public Safety was led by this notorious radical, who eventually was guillotined himself.

ANSWER: Maximilien de **Robespierre** <JR>

5. Answer some questions about South American geography, for 10 points each.

[10] If you start in the north of the Galápagos' Isabela Island and head east, you'll find yourself on this longest line of latitude on Earth. Only half of you would be in the Northern Hemisphere.

ANSWER: The **Equator** [or **0°** latitude]

[10] This city is home to the Carondelet Palace and is second-most populous in its nation, behind Guayaquil. It is the capital of the country that controls the Galápagos.

ANSWER: Municipality [of the Metropolitan District] of **Quito** [or Municipio de **Quito**; or Municipio del Distrito Metropolitano de **Quito**; or **MDMQ**; or San Francisco de **Quito**]

[10] East of Quito, near Brazil's Amazonas Province, is this largest city on the Amazon, the most isolated site of 2014 World Cup matches.

ANSWER: Municipality of **Manaus** [or Município de **Manaus**; or **Manáos**; or Cidade da **Barra do Rio Negro**; or Lugar de **Barra do Rio Negro**] <JW>

6. This painter was the first to title many works simply "Improvisation" or "Composition." For 10 points each:

[10] Name this author of art books like *Point and Line to Plane* and *Concerning the Spiritual in Art*.

ANSWER: Wassily [Wassilyevich] **Kandinsky**

[10] Kandinsky wrote those texts for this art school, which was founded by Walter Gropius. Paul Klee's lectures here were compiled into his "Notebooks."

ANSWER: the **Bauhaus**

[10] During its fourteen-year history, the Bauhaus was located in this country. The Bauhaus was closed in 1933 because of pressure from this country's new government, which accused the Bauhaus of promoting "degenerate art."

ANSWER: **Germany** [or **Deutschland**; or **Weimar** Republic; or **Weimarer** Republikor; or **German Reich**; or **Deutsches Reich**] <JR>

7. It can be difficult to measure distances to distant astronomical objects. Answer these questions about methods astronomers use to do it, for 10 points each.

[10] A trigonometric method uses *this* quantity, the distance between where an object appears when viewed from two different positions. You can demonstrate it by holding up a thumb and looking at it with one eye closed, then the other.

ANSWER: **parallax**

[10] Distances to farther stars can be measured by comparing this property, measured in watts, with Cepheid variables or other objects for which this property is known. It's proportional to the 3.5 power of mass for main-sequence stars.

ANSWER: **luminosity** [prompt on "brightness"]

[10] Going even farther, distances to spiral galaxies can be estimated using this relation, which states that the luminosity of a spiral galaxy is approximately proportional to the fourth power of its rotational velocity.

ANSWER: **Tully-Fisher** relation <HX>

8. This author wrote a poem asking Celia to "drink to me only with thine eyes." For 10 points each:

[10] Identify this English playwright, who depicted a different Celia as the wife of Corvino, one of the three men vying for a fortune.

ANSWER: Ben **Jonson** [or Benjamin **Jonson**]

[10] In another Jonson play, Lovewit's housekeeper poses as Captain Face and tries to sell this item to Sir Epicure Mammon. This item supposedly turns base metals into gold.

ANSWER: **philosopher's stone**

[10] Those events take place in this Jonson play, titled after the con artist Subtle's supposed profession.

ANSWER: *The* **Alchemist** <GL>

9. During this man's prime ministership, the ship *Arrow* was seized and the Crimean war ended. For 10 points each:
[10] Name this long-time British Foreign Secretary who gave the "*Civis Romanis Sum*" speech during the Don Pacifico affair and was famous for his interventionist foreign policy.

ANSWER: the 3rd Viscount **Palmerston** [or Henry John **Temple**]

[10] Palmerston was also Prime Minister during this conflict, which Britain almost joined after the *Trent* affair. One side in this conflict hoped to leverage their cotton production to get Britain involved on their side.

ANSWER: American **Civil War**

[10] Palmerston began his career as a Tory but ended up as a member of this British political party, of which William Gladstone was also a member. They were opposed by Disraeli's Conservatives.

ANSWER: **Liberal** Party [do **NOT** accept any answer involving "Labour"] <LL>

10. Answer some questions about a Hindu epic written by Valmiki, for 10 points each.

[10] In his namesake epic, this seventh avatar of Vishnu and son of Dasharatha slew the demon king Ravana in a great war and rescued his wife Sita. He often carries a bow and is accompanied by his brother Lakshmana.

ANSWER: **Rama**

[10] In the guise of one of *these* creatures, Hanuman lifted a mountain and shape-shifted to help Rama on his quest.

ANSWER: **monkeys** [or **vanara**]

[10] After Rama rescues Sita, he feared that she was unchaste, so he forced her to undergo this ordeal, which cleansed her.

ANSWER: trial by **fire** [or **walking** on hot **coals**; prompt on any equivalents that mention "flames" or "fire"]

<FM/JR>

11. He co-wrote the Dogme 95 manifesto with Thomas Vinterberg. For 10 points each:

[10] Name this provocative Danish film director whose movies include *Dogville*, *Breaking the Waves*, *Dancer in the Dark* and *Nymphomaniac*.

ANSWER: Lars von **Trier**

[10] After joking that he was a Nazi in 2011, Lars von Trier was banned from this film festival in southern France. It awards the Palme d'Or, probably the most prestigious prize for art-house films.

ANSWER: **Cannes** Film Festival

[10] The only Von Trier film that adheres to the Dogme 95 rules is *The Idiots*, which was shot entirely with this type of camera. This type of camera has taken over the movie industry, replacing the use of actual film.

ANSWER: **digital** camera <IKD>

12. The suffix "-pod" means "foot." Name some things in biology related to it, for 10 points each.

[10] Gastropods include slugs and these relatives, which have spiral-shaped shells.

ANSWER: **snails**

[10] Description acceptable. Cephalopods like cuttlefish, squid, and octopus mostly use *this* mechanism to move around.

ANSWER: **jet** propulsion [accept any description involving squirting water out **behind** them]

[10] Amoebas move around by creating *these* projections.

ANSWER: **pseudopods** [or **pseudopodia**] <JR>

13. A golden apple a day keeps death away. For 10 points each:

[10] Identify this Norse goddess whose golden apples keep the residents of Asgard nice and immortal. She is briefly kidnapped by Thiazi in the form of an eagle.

ANSWER: **Idunna** [or **Ithun**]

[10] Idun is the goddess of this concept, like the Greek Hebe. When Eos made Tithonus immortal, she forgot to ask for this property, leaving him to shrivel up into a wrinkled old grasshopper.

ANSWER: **youth** [or eternal **youthfulness**; or **not growing old**; accept equivalents; do not accept or prompt “immortality” or equivalents]

[10] Consumption of these non-apple fruits in the Jade Emperor’s garden can also confer immortality. Sun Wukong eats some in *Journey to the West*, enraging everyone.

ANSWER: **peaches** of immortality [or pan **tao**; or xian **tao**] <GL>

14. A golden spike connected two of these structures at Promontory Summit, Utah, in May of 1869. For 10 points each:

[10] Name this type of transportation infrastructure, including that Transcontinental one. The Interstate Commerce Commission was created in 1887 to regulate rates levied by companies in control of these structures.

ANSWER: **railroads** [or **railways**]

[10] This railroad was incorporated by an act of Congress in 1862. It was built going west from Council Bluffs, Iowa.

ANSWER: **Union Pacific** Railroad [accept **UP**; do **NOT** accept any answer with the word “Central” in it]

[10] This guy was vice-president of the Union Pacific Railroad when it met the Central Pacific Railroad. Unfortunately, he then created the scandalously corrupt company Crédit Mobilier of America.

ANSWER: Thomas C. **Durant** <MW/JR>

15. This event happens to bromothymol blue at a pH around 6. For 10 points each:

[10] Name this event that happens four times to a universal indicator going through the full gamut of pHs. Litmus paper is possibly the most well-known indicator to do this in acidic or basic solutions.

ANSWER: they **change color** [accept any equivalent descriptions; accept answers that involve specific colors]

[10] Chemical clocks change color in a periodic fashion. Probably the most famous chemical clock uses this element, which becomes seriously blue around starches.

ANSWER: **iodine** [or **I**]

[10] This indicator turns pink or purple in basic solutions with pHs between 8 and 12.

ANSWER: **phenolphthalein** <JR>

16. The music video for this song cuts between the band performing and videos of different faces lip-synching the lyrics. For 10 points each:

[10] Name this song, the highest charting single from *Speaking in Tongues*, which features lines like “Strange but not a stranger”, “No visible means of support” and “365 degrees!” before the whole band shouts the chorus.

ANSWER: **“Burning Down the House”**

[10] *Burning Down the House* was written by this David Byrne-fronted band that also performed songs like “Once in a Lifetime,” “And She Was,” and “Psycho Killer.”

ANSWER: The **Talking Heads**

[10] The disembodied heads of Agnetha and Anni-Frid pop up in music videos for this band’s song “Knowing Me, Knowing You.” This Swedish pop group from the late seventies is responsible for the soundtrack to *Mamma Mia*.

ANSWER: **ABBA** <IKD/JR>

17. Schubert’s “Great C Major” is one of the first symphonies to include quiet passages for these instruments. For 10 points each:

[10] Name these heavy, low brass instruments. The precursors to these instruments were sackbuts, which, like these instruments, changed pitches by moving a slide back and forth.

ANSWER: **trombones**

[10] Schubert liked to experiment with instrumental combinations. For instance, he wrote a weirdly-scored piano quintet nicknamed for one of these animals, because it includes variations on his song of that name.

ANSWER: a **trout** [accept “Die **Forelle**”; prompt on “fish”]

[10] The “Trout” Quintet is weirdly-scored because it includes this instrument instead of a second violin.

ANSWER: double bass [accept any answer mentioning a non-electric bass] <JR>

18. One character in this novel hides his marriage to the crippled Maria Timofeevna from his mother, Varvara. For 10 points each.

[10] Name this novel in which the actions of Nikolai Stavrogin lead Pyotr Verkhovensky to think him necessary in his Nihilist plot to overthrow the government. Its title is sometimes translated as *The Possessed*.

ANSWER: Demons [or *The Devils*]

[10] This author of *Demons* also created Prince Myshkin in *The Idiot*, as well as Ivan, Dmitri, and Alexei in *The Brothers Karamazov*.

ANSWER: Fyodor [Mikhailovich] Dostoevsky

[10] This Dostoevsky protagonist thinks himself a modern Napoleon. He murders the pawnbroker Alyona and her sister Lizaveta and subsequently goes insane.

ANSWER: Rodion Romanovich Raskolnikov [accept either underlined part; he’s the protagonist of *Crime and Punishment*] <NW>

19. [Note to moderator: please read the gray-highlighted text SLOWLY]

When written using the material derivative, this equation is just a form of Newton’s second law. For 10 points each:

[10] Name this partial differential equation, the left side of which is written “rho times the quantity: partial-*u* partial-*t* plus *u* dot gradient-*u*.” On the right side, one of its terms is the negative gradient of pressure.

ANSWER: Navier-Stokes equations

[10] Unlike other fluid-mechanical equations, the Navier-Stokes equations can model acceleration in this kind of flow. This kind of flow gives rise to heat transfer that is neither conduction nor radiation.

ANSWER: convection [or convective flow; accept convective acceleration]

[10] The Navier-Stokes equations also include a term for this quantity, which represents the internal forces in an object. It is represented by a tensor named for Cauchy, and it gives rise to strain.

ANSWER: stress [accept any answer including the word “stress,” EXCEPT do NOT accept “stress-energy tensor”] <JR>

20. Magical realism gives you strange dietary habits. For 10 points each:

[10] Name this Gabriel Garcia Márquez novel in which Rebeca keeps eating earth despite the chastisement of matriarch Ursula Buendía. Rebeca marries Jose Arcadio but lives alone after he dies from a mysterious gunshot.

ANSWER: One Hundred Years of Solitude [or Cien Anos de Soledad]

[10] In Garcia Marquez’s *Love in the Time of Cholera*, this woman despises her mother-in-law because Dona Blanca only cooks eggplant, an “abhorrent” vegetable. She has relationships with Juvenal Urbino and Florentino Ariza.

ANSWER: Fermina Daza [or Fermina; prompt on “Daza”]

[10] In this novel by Mexican author Laura Esquivel, Tita de la Garza eats candles because her first love, Pedro, dies of joy after “lighting all his matches at once.” That act burns down their ranch, leaving only a cookbook.

ANSWER: Like Water for Chocolate [or Con Agua para Chocolate] <GL>

Tiebreaker

21. The French conducted this activity 181 times at Moruroa and Fangataufa in the Tuamotu Archipelago. For 10 points each:

[10] Identify this practice, nominally banned by the CTB Treaty adopted by the UN in 1996. The United States performed this activity in an area known as the Pacific Proving Grounds.

ANSWER: nuclear testing [accept any answer involving nuclear devices being detonated for test purposes]

[10] Bikini Atoll was the site of Castle Bravo, where the U.S. first tested a dry-fuel version of this weapon. This kind of bomb, which uses nuclear fusion, is many times more powerful than the atom bomb.

ANSWER: **hydrogen** bomb [or **H**-bomb; or **thermonuclear** weapon]

[10] The *Rainbow Warrior*, a vessel owned by *this* controversial anti-nuclear organization, was bombed by French agents in 1985 while sitting in the harbor of Auckland, New Zealand.

ANSWER: **Greenpeace** <MW>