

PARFAIT II Round 10

Caltech

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1 Caltech Tossups, Round 10

1. After talking to the curate Highbridge, the narrator berates him for “mundane ambition masquerading in a surplice.” Originally titled *The Simpletons* and *Hearts INsurgent*, the title character kills a rabbit outside of the window of his cousin, whom he loves, and she jumps out the window when her husband tries to sleep with her. Many elements, including the main character’s profession as a stonemason and his obsession with and inability to obtain a college education at “Christminster”, or Oxford are autobiographical. The unhappy marriage of the title character to Arabella, Sue’s unhappy marriage with Phillotson, and Father Time’s murder of his siblings and subsequent suicide form the plot of, for ten points, what last of Thomas Hardy’s novels?

Answer: Jude the Obscure or Jude Fawley

2. His sixth symphony was run through on a piano on Bastille Day, 1946 by a former student to whom the symphony is dedicated, Michael Mullinar. Following the serene 1943 fifth symphony, the octatonic modality of the sixth was something of a shock. Influenced by his contemporary at Cambridge, Bertrand Russell, he was an atheist, yet he was the editor of *The English Hymnal* starting in 1904, for which he wrote *For All the Saints*. His compositions included incidental music for *Scott of the Antarctic* and *The Wasps*, the ballets *Job and Old King Cole*, and nine symphonies. For ten points, name this composer known for his collections of English folksongs such as *Greensleeves* and such works as his *Fantasia on a Theme of Thomas Tallis*.

Answer: Ralph Vaughan Williams

3. Before being ousted, this country’s last head was a graduate of Eastern Kentucky University and Sam Houston State University with a PhD in criminal justice who founded Bus Sound, SOS, Baan Sai Thong, PacLink, and eventually Advanced Info Service. Its Government house was overrun by soldiers under the command of Sonthi Boonyaratglin, Chitchai Wannasathit, the deputy Prime Minister was arrested, and Rama IX was proclaimed the head of government. This all happened while Prime Minister Thaksin was in New York to address the United Nations. For ten points, name this large Southeast Asian nation with capital at Bangkok.

Answer: Thailand or Ratcha Anachak Thai

4. His official biographer was rewarded by becoming consul to Liverpool, an appointment kept until his former Bowdoin College roommate moved to Italy and wrote *The Marble Faun*. Wounded at the battles of Contreras and Churubusco during the Mexican war, his Whig opponents said that he was “the hero of many a well-fought battle,” contrasting this son of a former New Hampshire governor with the hero of Veracruz, “Old Fuss and Feathers” Winfield Scott, whom he defeated to become the 14th president of the US. For ten points, name this “Dark Horse” president who was rebuked by his party who nominated James Buchanan to run instead in 1856.

Answer: Franklin Pierce

5. His characters include a man who might have killed his ex-fiancee with a bicycle chain, a student trying to come up with a dramatic protest of the Vietnam war, and a dentist

who quotes Seneca. These characters are part of *Local Anesthetic*, a work he was reading at a conference in 1967 when a man named Scheub came on stage and committed suicide. But he also admitted being part of the same organization before reasing his biography, *Peeling the Onion*. For ten points , name this author of *Dog Years*, *Cat and Mouse*, and *The Flounder* who recently admitted he was a member of the SS.

Answer: Günter Wilhelm Grass

6. Its largest source is Grizzly creek, and its longest tributary is the Loup River. The first European to discover this river was the French explorer Étienne de Veniard, sieur de Bourgmont in 1714. It was an area of contention between French and Spanish, who led the Villasur expedition to attempt to curb French influence around this river. After being ceded to the United States in the Louisiana Purchase, it was explored and mapped by Major Stephen H. Long in 1820, and played an important role in westward expansion by providing fresh water, game, and a clear path westwards. Recently the river has shrunk considerably due to its damming and use by Colorado. For ten points , name this tributary of the Missouri formed from North and South branches that drains a large area in Nebraska.

Answer: Platte River

7. Pareto efficient trades must occur when they are tangent, and they were first developed by Edgeworth as the set of points where an offer line from the origin touches them. They slope downward from left to right. They do not intersect, and are convex. The two axes represent quantities of two goods, and every point on a given curve represents the same level of satisfaction. For ten points , name this economic graph which depicts all combinations of the two products that yield the same level of satisfaction for an individual.

Answer: indifference curve

8. Its opening is used in *Scrubs* when the Janitor is giving Carla “the evil eye” in “My New Liver.” In the *Gilmore Girls* episode “We’ve Got Magic to Do,” Kirk does an interpretive dance to music from this film. The minimally-scored time lapse scenes are evoked when homer oversleeps in ”My New Abie.” The producer, Francis Ford Coppola, steps out of an elevator an hour into the film, but better known scenes are the demolition of the Pruitt-Igo housing project, an elevated highway in San Francisco, and the ignition of a rocket. For ten points, name this film scored by Philip Glass whose sequels include *Powaqqatsi* and *Naqoyaqatsi*.

Answer: Koyannisqatsi or Life Without Balance

9. Ailon, Newman, and Charikar used a version of it to aggregate inconsistent ratings for use in search engines. Robert Sedgewick proposed in 1978 that the performance of this algorithm can be improved by changing to a different algorithm in the case of small numbers of elements. An iterative version has been implemented in order to allow for predictable memory use. Another optimization that can be made is to randomize the selection of the pivot value, which aims to deal with the problem that a maliciously crafted data set will cause the algorithm to perform at its worse-case performance, $O(n^2)$, which is much worse than its competitors, mergesort and heapsort. For ten points , name this algorithm, developed by C.A.R. Hoare, which in practice is typically the fastest of the

$O(n \log n)$ sorting algorithms.

Answer: Quicksort

10. Anselm says to Nicetas that John 15:26 does not prevent the addition to it of what was, according to Johannes Grohe, a Persian as well as Western creation called the filioque. This stated that the spirit went through the son as well as the father, and was intended to combat Arianism but helped split the Eastern and Western churches. Created at a council convened by Constantine in 325, most Christian denominations accept it as the basic statement of Christian faith and many characterize those that do not as non-Christian. For ten points, give this document whose that begins "We believe in one God, the Father, the Almighty, maker of heaven and earth" and is named after a city in modern day Turkey.

Answer: Nicene creed or Creed of Nicea, accept Niceno-Constantinopolitan Creed

11. A force divided between himself and Sir John Graham was sent to avenge the death of Marion, who had earlier concealed him. After having personally killed Heselrig, the sheriff of Lanark, in bed, he fought the battle of Biggar against Longcastle. He was knighted and ruled in the place of John de Balliol after a 1297 battle against the earl of Surrey where he managed to force the English to funnel through the Stirling bridge. Although hanged, disemboweled, beheaded, and quartered after being arrested near Glasgow, his rebellion expelled occupying English forces and laid the foundation for Robert the Bruce's successful rebellion. For ten points, name this Scottish knight and martyr killed in 1305 and who was the inspiration for *Braveheart*.

Answer: William Wallace

12. This athlete played basketball, ran track, and played football for the University of Tennessee at Chattanooga and was drafted in the third round of the 1996 NFL Draft. He has been an extremely prolific receiver, being one of 4 players in NFL history to have caught more than 100 touchdowns and holding the record for most catches in a game with 20. However, he is probably better known for his touchdown celebrations, such as signing the football with a Sharpie and handing it to his financial planner, and his disputes with teammates, when he insinuated that Jeff Garcia was homosexual. For ten points, name this current Dallas Cowboy who had a very public falling out with the Eagles after a nasty contract dispute.

Answer: Terrell Owens

13. First described in a 1923 paper, they can act as chiral catalysts for asymmetric carbon-carbon bond forming reactions, and the Sakurai reaction generally requires the use of one. They are employed in the Mukaiyama Aldol reaction and often used as catalysts in Diels-Alder, Ene, and Friedel-Crafts reactions. Commonly used examples in synthetic chemistry include ytterbium triflate, iron trichloride, aluminum trichloride, and boron trifluoride. These molecules can accept a pair of electrons to form a coordinate bond. For ten points, name these chemicals which are hydrogen acceptors, a superset of Bronsted-Lowry bases.

Answer: Lewis acids

14. In 1959, Chomsky critiqued his theories of verbal acquisition by saying that it could not account for generative behavior observed, and Hayes et al. said that his theory of verbal required professional mediation of reinforcement similar to that of his theories of programmed learning. His daughter Deborah was alleged to have suffered from psychosis after being raised in an “heir-conditioner,” but a more famous contraption he created used his theory of “shaping” to get pigeons to play table tennis. For ten points, name this American behaviorist and creator of operant conditioning who described his ideas in the works *Beyond Freedom and Dignity* and *Walden Two*.

Answer: Burrhus Frederic Skinner

15. He didn't publish his most famous result - a distribution of zero mean and skew, and variance and kurtosis of gamma over gamma minus two and six over gamma minus four, respectively - for want of correspondence with Fisher. Published in Galton's *Biometrika*, Fisher's suggestion of looking at the expansion in the inverse powers of another distribution instead of the z-distribution removed the need to use the complicated cosine formula. Motivated by saying "if you have ever drunk Guinness in England, you will understand why" it is important to determine if differences in acidity change how long beer remains potable, for ten points, name the brewery employee who developed a means of testing the equality of two normally distributed distributions with unknown variance or the modest pseudonym applied to his t-test.

Answer: William Gosset or student

16. In one of his paintings, a woman in white holds a grey purse hanging by a cord from her left elbow with a white opened umbrella, a stone wall, and a seascape behind her. If you replace the woman from *The Great War* with a man in a black suit and tie, you'll have a more famous painting that replaces the bird in flight from *Man with the Bowler Hat* with a green apple. Men with bowler hats also play a role in *Golconda*, where they fall like rain, and in *The Castle of the Pyrenees*, a castle floats on top of a cloud. For ten points, name this Belgian surrealist artist of *Son of Man* and *Time Transfixed*.

Answer: Renè-François-Ghislain Magritte

17. Upon sighting the enemy, the son-in-law of Marshal Field spread his squadrons eastward, forming an advance group in front of the focus under Evan-Thomas. The encounter happened during daylight because the *N.J. Fjord* was sighted by the *Elbing*, and the *Galatea* likewise investigated the Dutch ship. Hipper and Beatty then skirmished, with the *Indefatigable* and *Queen Mary* being sunk by the superior German fire. One side, led by Vice Admiral Scheer, had 18 battleships while their combatants, led by Admiral Jellicoe, had 33. After an intense battle, the British fleet lost more ships, but the Germans suffered very heavy damage and both sides claimed victory. FTP, name this 1916 battle in the North Sea, the largest naval battle of World War I.

Answer: Battle of Jutland or Battle of the Skagerrak

18. This theorem is closely related to Liouville's Theorem of Hamiltonian mechanics, the difference being that Liouville's Theorem uses a Poisson bracket. It can also be shown from the Lindblad equation. When applied to a particle moving in a potential field, the result is Newton's Second Law, demonstrating the fact that in many applications of this theorem the result is an application of Bohr's Correspondence principle. A relation of

the time derivative of the expectation value of a quantum mechanical operator to the commutator of that operator with the Hamiltonian of a system, for ten points, name this theorem that says the derivative of the expected momentum is equal to the expectation of the negative energy.

Answer: Ehrenfest's Theorem

19. Book ten says that because Homer has not cured Asclepius and that there is no city that can boast of being ruled by Homer, he is only a thrice removed imitator. Likewise, a painter paint a cobbler without knowing how to cobble, and thus it argues for censorship of the tragic poets and many other arts. It argues that society should be divided into groups based on the "Noble Lie:" the rulers, auxiliaries, and the common person. Because permanent, ideal Forms exist beyond the realm of perception, base imitator should be banned, and society work within the context of these figures visible through flashes on the wall of the cave. For ten points, name this dialogue narrated by Socrates and written by Plato that concerns the ideal state.

Answer: The Republic or Polihteia

20. His last novel, *Portrait of the Artist as an Old Man*, was published posthumously in 2000. *No Laughing Matter* was written with Speed Vogel in 1986 and describes this author's experience as a victim of Guillain-Barre Syndrome. Other works include *Closing Time*, a sequel to this author's most famous work, *God Knows*, a modern version of the story of King David, and *Something Happens*, which consists of a long monologue by the protagonist Bob Slocum. For 10 points, name this author most famous for writing the story of Chaplain Tappan, Colonel Catchcart, Milo Minderbinder, and Yossarian in *Catch-22*.

Answer: Joseph Heller

21. Because almost all of its compounds are paramagnetic, this element's DOTA is an improvement of gadolinium chelates as an MRI contrast agent. First identified in Paris in 1886 by Paul Émile Lecoq de Boisbaudran, it was not isolated in a relatively pure form until the 1950s. It is never found in nature as a free element; instead, it is typically found in minerals such as xenotime, gadolinite, and monazite. This rare-earth metal of transition Group IIIb is used in conjunction with vanadium and other elements to make lasers, its oxide is used as cooling rods in nuclear reactors, and it is commonly used in the production of compact discs. For ten points, name this element with atomic number 66 that takes its name from the Greek for hard to obtain with chemical symbol Dy.

Answer: Dysprosium

2 Caltech Bonuses, Round 10

1. For 10 points each, answer the following questions in particle physics.
 - 10 These are particles with half-integral spin.
Answer: fermions
 - 10 Fermions obey the Pauli exclusion principle, first used to explain this effect named for a Dutch physicist that explains spectral line splitting.
Answer: Zeeman effect
 - 10 Integral spin particles, however, are able form this state of matter when many particles share the same quantum state.
Answer: Bose-Einstein Condensate

2. One of the lesser characters in this book is Peter Keating, who wanted to be a painter, but whose mother pushed into becoming an architect. For ten points each . . .
 - 10 Name this book, the first success of its author.
Answer: The Fountainhead
 - 10 Name *The Fountainhead's* protagonist, the man who is what Peter Keating could not be, and whom Gail Wynand could be if he would stop sucking at the teat of public opinion.
Answer: Howard Roark (accept either name)
 - 10 The object of Roark's love is this woman, daughter of Peter Keating's boss, who cherishes Roark's greatness but believes he is doomed to failure.
Answer: Dominique Francon (accept either name)

3. Let's all relax with some soothing Dutch painting from the seventeenth century for ten points each.
 - 10 First, what Dutch master painted *View of Delft*, *The Allegory of Painting*, and *Woman with a Water Jug*?
Answer: Johannes/Jan Vermeer
 - 10 This Vermeer painting shows a girl with a blue and yellow turban wearing the title jewelry.
Answer: Girl with a Pearl Earring or Het meisje met de parel
 - 10 While a cello, table, and chair partially block our view, a mirror on the wall shows an improbable reflection of the girl sitting at a virginal while a well-dressed man looks on.
**Answer: De Muzikles or The Music Lesson
or A Lady at the Virginals with a Gentleman**

4. "Oh, oh, oh! To touch and feel virgin girls' vaginas and hymens" is a mnemonic med students use to memorize the cranial nerves. Let's see how well you know them for ten points each.

- 10 This is the longest of the cranial nerves and controls everything from breathing, heartbeat, and the contractions of the digestive system.
Answer: vagus (or CN X)
- 10 The brancial motor branch of the vagus controls one of the muscles of the tongue, while this nerve controls the genioglossus, styloglossus, and its namesake.
Answer: hyoglossus (or CN XII)
- 10 The abducens and trochlear nerves control the movement of what organ?
Answer: eye (via the extraocular muscles through an invervation of the lateral rectus)
5. Samuel Pepys carried one around with him in order to convince people suffering from one to have it removed. For ten points each ...
- 10 Name this accrecition of minerals often found in the ureter.
Answer: kidney stones or nephrolithiases or urolithiases or renal calculi
- 10 This man claimed to write his best works while suffering from the pain of kidney stones. Anyone listening to *Onward Christian Soldiers* certainly relives a bit of it. Somewhat appropriately, his last work with his most famous collaborator was *The Beauty Stone*.
Answer: Arthur Sullivan
- 10 This fan of Gilbert and Sullivan feared becoming dependent on morphine to relieve the pain of kidney stones; in one of his stories, the waiter Henry solves a puzzle based on when HMS Pinafore premiered in a Black Widowers tale. He also wrote *Pebble in the Sky* and *Caves of Steel*.
Answer: Isaac A. Asimov
6. It called for deliberative assemblies, and said that all classes should vigorously carry out the plan to rid the county of its old ways and embrace knowledge. For ten points each ...
- 10 What was this statement promulgated by the Meiji Emperor?
Answer: Charter Oath or Imperial Oath Of Five Articles or Gokajo No Goseimon
- 10 The 1889 constitution, a gift from the emperor, saw the formation in the next year of what Japanese bicamerial parliament?
Answer: Diet or Kokkai or Teikoku Gikai
- 10 The most violent oposition to the principles of the Charter Oath came from Saigo Takamori, who led this southern rebellion.
Answer: Satsuma Rebellion or Seinan Senso
7. For ten points each , answer the following questions about thermodynamics.

- 10 This quantity measures the “useful” work obtainable from a system with constant temperature and volume, and is equal to the product of temperature and entropy subtracted from the energy.
Answer: Helmholtz Free Energy
- 10 This quantity measures the work obtainable from a system with constant temperature and pressure, and is equal to the Helmholtz free energy with enthalpy substituted for energy.
Answer: Gibbs free energy
- 10 This quantity is equal to the derivative of the Gibbs or Helmholtz free energy with respect to the number of particles.
Answer: Chemical potential
8. She wore a fake beard as a symbol of her rule and launched an expedition to Punt. For the stated number of points . . .
- 10 For ten, name this female ruler of the eighteenth dynasty, who ruled from 1473 to 1458 BC.
Answer: Hatshepsut or Hatshopsitu
- 5 Hatsheput rebuilt the temple of her father at this location that has shrines to Amon-Re, Montu, Mut, and Amenhotep IV.
Answer: Ipet Sut or Karnak
(accept Luxor, which is technically different but was eventually merged with Karnak)
- 10 This son-in-law of Hatshepsut successfully fought the Mitannians and extended the empire south to Napata.
Answer: Thutmose III
9. Because the castles in Guînes and Ardres were pretty crappy, the two monarchs made dazzling temporary camps. For ten points each . . .
- 10 Name this June 7 to 24, 1520 meeting held near Calais.
Answer: Field of the Cloth of Gold or Le Camp de Drap d’Or
- 10 For ten points, name either the French or the English king present at the meeting.
Answer: Francis I (Of Angoulême) or Henry VIII Tudor
- 10 Francis I wanted, but failed to get Henry VIII to align himself against this Holy Roman Emperor and son of Philip I, his rival.
Answer: Charles V
10. For 10 points each, identify these Unequal Treaties made by China during the late Qing dynasty.
- 10 This treaty ended the First Opium War. It opened up 5 Chinese ports to trade with and ceded Hong Kong Island to the British.
Answer: Treaty of Nanjing (Nanking)

- 10 This treaty ended the Sino-Japanese War. It ceded Taiwan and the Liaodong peninsula to Japan and forced China to pay a hefty indemnity.
Answer: Treaty of Shimonoseki
- 10 This treaty between China and Russia established their border along the Amur river, effectually ceding control of Outer Manchuria to Russia.
Answer: Treaty of Aigun
11. 30-20-10: Name the work of literature.
- 30 Some components of this work include the poems On Another's Sorrow, A Cradle Song, and Laughing Song.
- 20 Other components include The Echoing Green, The Little Black Boy, and The Chimney Sweeper.
- 10 Its most famous component is The Lamb. Written by William Blake, it is the complement of Songs of Experience which was published 5 years later.
Answer: Songs of Innocence
12. For 10 points each, name these programming languages by description.
- 10 This programming language was developed by Microsoft for their .NET platform and is based on C++ and Java.
Answer: C# (C Sharp)
- 10 This object-oriented programming language create by Bertrand Meyer focuses heavily on design by contract and was named after an engineer who got his projects completed on time and under budget.
Answer: Eiffel
- 10 This functional programming language with non-strict semantics was first released in 1990. It is based on the programming language Miranda and is named after a logician.
Answer: Haskell
13. Hugo Kalmar, an anarchist editor, is drunk for the entire play, and begs the proprietor, who refuses to admit he's a pimp, for another drink. For ten points . . .
- 10 Name this play that also features the "foolosopher" Larry Slade.
Answer: The Iceman Cometh
- 10 This playwright wrote *The Iceman Cometh*.
Answer: Eugene O'Neil
- 10 When Theodore Hickman eventually comes, he's constantly hounded by this eighteen-year-old who's mom once shacked up with the salesman.
Answer: Don Parrit (accept either)
14. Identify the following subfields within linguistics, for ten points each.

- 10 The subfield which studies word structure, such as how plurals and compound words are formed
***Answer:* morphology**
- 10 Not to be confused with phonetics, which studies how a language's sounds are physically produced and perceived, this branch of linguistics is concerned with the way sounds function within a language or between languages.
***Answer:* phonology**
- 10 As opposed to semantics, which focuses on intrinsic meaning, this attempts to address how meaning goes from the speaker's meaning to what is interpreted.
***Answer:* pragmatics**
15. Answer the following questions about Pacific islands for ten points each.
- 10 This group of islands is a territory of the United States. Its largest island is Tutuila, and it lies southeast of a sovereign nation of the same name.
***Answer:* American Samoa**
- 10 This group of islands was a former colony of the United Kingdom and saw some of the bitterest fighting of World War II. Its capital, Honiara, lies on the island of Guadalcanal.
***Answer:* Solomon Islands**
- 10 This island nation underwent a coup in 2000 when rebels led by George Speight overthrew the elected government.
***Answer:* Fiji**
16. This sanskrit term means natural law, and all who follow it will more quickly reach enlightenment. But just using the phrase won't help you, as evidenced by these examples from pop culture. For ten points each . . .
- 10 This title character of an ABC show whose middle name is "Freedom" changed her last name from Finkelstein to Montgomery after marrying her lawyer husband after their first date.
***Answer:* Dharma (from Dharma and Greg)**
- 10 The band Steadman, originally known as the Dharmas, released a song for the "University" expansion pack to this Maxis sequel. The lyrics, like all in-game dialog, is phonetically consistent gibberish.
***Answer:* Sims II**
- 10 Founded by Gerald and Karen DeGroot and funded by the Hanso Foundation, the DHARMA initiative is featured on this television show.
***Answer:* Lost**
17. He pierced his foreskin to breathe life into bones, but as he was racing out of the caves, he dropped them, thus leading to the different heights of humans in the fifth age. For ten points each ...

- 10 Name this god who stole the bones.
Answer: Quetzalcoatl
- 10 Quetzalcoatl stole the bones from this realm of the dead.
Answer: Mictlan
- 10 In order to reach Mictlan, ordinary mortals are burned with this animal who must guides the dead to the 9th level of Mictlan.
Answer: dog
18. Identify the following Little Women characters for ten points each.
- 10 This second-youngest sister is quiet and kind, and enjoys playing with her dolls and the piano.
Answer: Elizabeth March
- 10 The novel's protagonist, she is a tomboy who loves to write. She sells her long hair to pay for her mother's trip to visit her father.
Answer: Josephine March
- 10 A German professor, he eventually ends up marrying Jo.
Answer: Professor Friedrich (Fritz) Bhaer (accept any underlined name)
19. Given some components of a biochemical cycle and a brief description, name that cycle for ten points each.
- 10 The second stage of cellular respiration: fumarate, malate, citrate.
Answer: citric acid or Krebs or TCA cycle
- 10 Liver cells dispose of nitrogenous waste: citrilline, ornithine, argininosuccinate.
Answer: Urea cycle
- 10 Generates NADPH and the synthesizes pentose sugars: NADPH, Glucose 6-phosphate, ribulose-5-phosphate
Answer: pentose phosphate cycle (accept Phosphogluconate Pathway, or Hexose Monophosphate Shunt) or RPP

Answer the following about the Western Schism for ten points each. . .

- 10 The crisis was resolved by this council held in 1417.
Answer: Council of Constance
- 10 The crisis resulted from the return of the papacy to Rome from this city in 1378.
Answer: Avignon
- 10 For a final ten points, name any of the three popes deposed by the Council of Constance.
Answer: (Pisan) John XXIII, (Avignon) Benedict XIII, (Rome) Gregory XII

20. In 1935, a polymer was introduced which revolutionized the synthetic fiber industry. For ten points each . . .

10 Give the trade name for this DuPont product which resulted from the polymerization of a diamine and a dicarboxylic acid.

***Answer:* Nylon 66**

10 Nylon was first synthesized by Gerard Berchet working in the lab of what DuPont chemist?

***Answer:* Wallace Carothers**

10 Nylon 66, the most common form, is formed in the condensation reaction between hexamethylene diamine and hexanedioc acid, the latter of which also has this common name.

***Answer:* Adipic acid**