

**Tossups:**

1. This man was opposed to the top-down Westernization and secularization of his country, in particular the “White Revolution” of 1963 that pushed for women’s rights, literacy, a more liberal economy, and other changes. After disputes with the government, one of which got him slapped by the prime minister, this man spent fourteen years in exile in Najaf, Iraq, holy to Shi’a. During his exile, this cleric solidified his thoughts about the legitimacy of Sharia law and the key role of mullahs to interpret it in government. He also vowed not to return to his country until its leader, Mohammed Reza Pahlavi, left. When this firebrand returned to his country, he galvanized the people to tear down the provisional government and institute a Muslim theocracy in place of the shah. FTP, name this Grand Ayatollah and Supreme Leader of the Islamic Revolution under whom the Iran Hostage Crisis occurred.

ANSWER: Supreme Leader or Grand Ayatollah or Imam Ruhollah Mousavi **Khomeini** (not Ali Khomeini)

2. The fuses in some rocket propelled grenades make use of this effect, while sensors utilizing it can be used to measure vibrations. Like Ferromagnetism, dipoles in materials exhibiting this effect are often aligned in Weiss domains. One of the most common uses of it is in cigarette lighters where a material with this property is struck by a spring-loaded hammer. The converse of this effect, electrostriction, allows bones to slightly change their structure in the presence of an electric field. Discovered by Jacques and Pierre Curie in 1880, FTP, is this effect which is most prominently displayed in compounds like barium titanate, berlinite, Rochelle salts, and quartz.

ANSWER: **piezoelectric** effect or **piezoelectricity**

3. Adult Swim recently released a flash game requiring players to control a robotic one of these animals while chasing butterflies and crushing stars. Wolfmother sang a song about a "white" one of these animals on their eponymous album and Honda produces a line of motorcycles named after this animal. A flash video featuring two of these animals sees them meet a magical leopleurodon, cross a bridge of hope and wonder and finally reach the titular destination, Candy Mountain. The narwhal is often cited as a possible source of, FTP what fictional animal with a flowing mane, cloven hoof, and giant horn that distinguishes it from a horse.

ANSWER: **Unicorn**

4. Jane Seymour sings with the title character in the duet "Sul suo capo aggravati un Dio" in his opera *Anna Bolena*, or *Anne Boleyn*. The Duchess of Krakenthorp is a spoken role in another opera by this composer, which contains an aria that Juan Diego Florez encored at La Scala, the first in 74 years. That aria contains nine high Cs and is called "Ah! mes amis." In another opera, the title character tells of seeing the ghost of a girl by a fountain, and that opera features the sextet "Che mi frena" and a mad scene following the title character's murder of her groom Arturo. That opera is based on a novel by Sir Walter Scott. For 10 points, identify this composer of *The Daughter of the Regiment* and *Lucia di Lammermoor*.

ANSWER: Gaetano **Donizetti**

5. This man’s commands at the battles of Ridgefield and Valcour lake were unsuccessful. Earlier he had roughed up a man who was threatening to reveal his 16,000 pound trade deficit he had acquired while working for the Sons of Liberty. Although this man fought bravely at Saratoga and suffered a wounded leg, he was passed over for a promotion, which may have served to inspire his most famous act. The capture of John Andre, foiled, FTP, what man’s plans to turn over his new command of West Point to the British?

ANSWER: Benedict **Arnold**

6. This country was ruled by the strong handed Antonin Novotny for more than a decade shortly after World War II. Its post World War II economic growth was substantial, although it was far eclipsed by countries like Germany and Japan. After this country’s formation following World War I, Thomas Masaryk served as its first president. Following an uprising in this country, Gustav Husak ruled as Communist party secretary. This country was shortly ruled as a democracy after the Velvet revolution by Vaclav Haval before breaking up into two republics in 1992. FTP, identify this European state in which Alexander Dubcek attempted to create “socialism with a human face” after Prague Spring.

ANSWER: Czechoslovakia

7. Pablo Picasso painted a series of 58 colorful copies of this painting. The red cross of the Order of Santiago was added to one person's chest several years after the painting's finish, possibly by King Philip IV himself. This painting includes a dog lying in the foreground; two women of the title profession; and two dwarfs. This painting shows a chamberlain who may be related to the artist standing in a doorway in the back of the room, looking on at the scene of the *infantes* getting ready to pose for their portrait. FTP, name this royal portrait of the Infanta Margarita whose artist showed himself at an easel at the left of the painting and was named Diego Velázquez.

ANSWER: Las Meninas or The Handmaidens

8. This man commanded Polydus of Argos to find and resurrect his dead son, and later to teach this son, Glaucus, the art of divination. He defeated king Nisus of Megara with the help of that king's daughter Scylla, who fell in love with this man. He rose to power by killing the ruler Asterion and banishing his brothers Sarpedon and Rhadamanthys, the latter of which would share his role in Hades. He was killed in his bath by the daughters of King Cocalus of Sicily during his search for a man who threaded a spiral seashell by tying a string to an ant. That man escaped this ruler's island after designing both a mechanical cow for his wife Pasiphae and the labyrinth that held her son, the Minotaur. For ten points, name this judge of the dead and king of Crete.

ANSWER: Minos

9. Stacks of these cells are known as rouleaux, and they can be detected via the direct Coombs test. Their surface antigenic response can be described by the Colton, Diego, and Duffy systems, and they are characterized by high levels of both CD47 and Kidd glycoproteins. Containing spectrin and ankyrin in their cytoskeleton and known for their lack of a nucleus, these cells are produced in bone marrow in a process stimulated by erythropoietin. FTP, name these oxygen-carrying, hemoglobin-containing cells found in arteries and veins.

ANSWER: red blood cells or erythrocytes

10. This man's less famous works include the *Prolegomena to Any Future Metaphysics*, while his most important work attempts to determine whether a priori synthetic judgments are possible. In that work, this author distinguishes the noumenal and phenomenal realms, and states his intention to create the equivalent of the Copernican revolution in metaphysics. His most famous idea in ethics can be stated either as the necessity of regarding human beings as ends in themselves. For ten points, name this founder of German idealism, who developed the categorical imperative in his *Groundwork for the Metaphysics of Morals* and claimed that things in themselves could not be perceived in his *Critique of Pure Reason*.

ANSWER: Immanuel Kant

11. The epigraph to this novel comes from Romans, and begins "I will call them my people, which were not my people." One character in this work receives a tree-shaped scar when she is beaten by a group of men who also steal her breast milk. She agrees to have sex with an engraver to get her child's name carved on a tombstone. FTP, name this novel about the lives of Denver, Paul D, and Sethe, who live in a house haunted by a slain baby, a work by Toni Morrison.

ANSWER: Beloved

12. The foundations of this agreement were laid during the Tangier Crisis, when the countries involved in the agreement worked to secure distinct spheres of influence in North Africa. Another country entered into this agreement after its humiliating loss in a 1905 war with Japan, thereby causing the country in question to seek alliances elsewhere in order to secure its own position. Nations opposing this agreement had threatened to develop a vast global empire and create a strong navy, threatening the absolute maritime dominance of one of the countries in the aforementioned agreement. FTP, give the name of this alliance between France, Russia, and Great Britain opposing the Central Powers during World War I.

ANSWER: triple entente

13. In one poem by this author, the speaker has visions of a ball in Venice while playing the titular piece, while in another, the speaker that superb craftsmanship but lack of inspiration have caused him to be

condescendingly labeled “The Faultless Painter”. Those poems, “*A Tocatta of Galuppi’s*” and “*Andrea Del Sarto*” were both collected in *Men and Women*. In another poem by this author, the speaker strangles his lover with her own hair. In what is probably his most anthologized poem, the Duke of Ferrara tells the story of a woman painted in a portrait by Fra Pandolf. FTP, this is what English poet best known for dramatic monologues such as *Porphyria’s Lover* and *My Last Duchess*?

ANSWER: Robert **Browning**

14. Its nitride form is used in some protective coatings, while the chloride of this element is functional as a Ziegler-Natta catalyst for polyolefins production. Its strength and ability to osseointegrate make it effective in medical implants, and its dioxide has found uses in white pigments, photocatalysts, and sunscreens. The ninth most abundant element in the Earth’s crust, it can be extracted from ilmenite and rutile using either the Hunter process or the commercialized Kroll process. FTP, name this corrosion-resistant transition metal that has a higher strength-to-weight ratio than aluminum, with atomic number 22 and symbol Ti.

ANSWER: **titanium**

15. The protagonist of this work is described as suffering endlessly from the poorness of her house, and feeling she was born for luxury. Tears over having nothing to wear cause her husband to give her the four-hundred francs he had been saving to buy himself a gun. The plot thickens after the Minister of Education’s ball, when the protagonist realizes she has lost something she was wearing. She, Mathilde, and her husband, Monsieur Loisel are therefore forced to labor in poverty for ten years to replace it. FTP, the title object, borrowed from Madame Forestier, is revealed at the end to be a fake in what short story by Guy de Maupassant?

ANSWER: *The **Necklace** or La **Parure***

16. During the reign of Alfred the Great, Witanagemot meetings were held at this location. A monument celebrating a famous event that took place here was designed by the American Bar Association. The topography of this place is classified as “Thames Basin lowland.” The most important even that occurred here followed the defeat of Otto IV by Philip Augustus at the battle of Bouvines. FTP, identify this location that saw Otto IV’s ally, King John, forced to sign a document that granted protections to English nobles and thus established the basis of English common law, the Magna Carta.

ANSWER: **Runnymede**

17. In a radio play by this author, Edward discusses his fears of growing old with his wife Oliver, and his fear of a silent character in the play, the Matchseller. That play is *A Silent Ache*. *No Man’s Land* and *A Kind of Alaska* are among his “memory plays”, but he is most famous for his “comedies of menace”, which include one in which Teddy introduces his new wife Ruth to his family for the first time and one in which Goldberg and McCann disrupt the title event planned for Stanley Webber. FTP, this is what British playwright of *The Homecoming* and *The Birthday Party*?

ANSWER: Harold **Pinter**

18. A proof of this theorem by President James A. Garfield involves the calculation of the area of a right trapezoid by different methods. Another common method of proving this theorem is by inscribing a square at an angle inside of a larger square, and calculating area of the square both as a whole and as a sum of the component triangles and smaller square. A special case of the law of cosines, FTP name this theorem describing the relationship between the length of the legs and the hypotenuse of a right triangle.

ANSWER: **Pythagorean** theorem

19. A powerful symbol in this work is the tiny golden fish one of the major characters consistently crafts after losing his memory; that character shows both intricate artistic capability as well as a mastery of brute force, as he has led thirty-two civil war campaigns (all of which he loses) and has fathered seventeen children, all adopting his name, by seventeen mothers. Aureliano, the aforementioned character, was the product of an incestuous relationship between José Arcadio and Úrsula Iguarán, second cousins and the patriarchs of the Buendía family. FTP, name this classic of Latin American Magical Realism taking place in the fictional village of Macondo, the magnum opus of the Colombian author Gabriel García Márquez.

ANSWER: ***One Hundred Years of Solitude** or **Cien años de soledad***

20. This principle can be derived from the law of conservation of energy, and a particular case of this is Torricelli's theorem. Another effect derived from this is the Venturi effect, which describes a reduction of pressure under certain conditions. This principle holds only for inviscid flow and can be applied to gases at low Mach number. FTP, name this principle, which states that an increase in the speed of a fluid can occur simultaneously with a decrease in pressure or potential energy, and which can be used to explain the phenomena of lift and curveballs.

ANSWER: **Bernoulli's** principle

21. This region of the world is generally characterized by hot and humid weather, with monsoons in June and December bringing heavy seasonal rainfall. The association containing this region's countries currently has ten members, though East Timor will be a logical future member. Home to the world's largest Muslim nation, where President Barack Obama spent part of his childhood, it is the most ecologically diverse place on Earth. Located between China and Australia, FTP, name this region in Asia, containing countries such as Thailand, Malaysia, the Philippines and Indonesia.

ANSWER: **South-East Asia**

### Bonuses:

1. FTPE, answer these questions about certain plant hormones and their functions.

[10] This class of tetracyclic di-terpenoid acids starts off the process of starch hydrolysis in seed embryos by promoting the production of alpha-amylase, though their effects can be inhibited by PBZ. They are better known as the hormone class responsible for stem elongation.

ANSWER: **gibberellins**

[10] This class of plant hormone is responsible for promoting cellular division and expansion through a process described by the acid growth hypothesis. They promote apical dominance, and their most common member is indole-3-acetic acid.

ANSWER: **auxins**

[10] Auxins enable this process in plants in which they either grow towards or away from a light source.

ANSWER: **phototropism**

2. Answer these questions about the atmosphere FTPE:

[10] After nitrogen and oxygen, this gas is the third most abundant in the atmosphere.

ANSWER: **argon**

[10] At 30 to 50 miles above the Earth, this layer lies between the stratosphere and the thermosphere.

ANSWER: **mesosphere**

[10] Named after an English physicist, this phenomenon describes the scattering of light by particles that are much smaller than the wavelength of light being scattered. It explains why the sky is blue.

ANSWER: **Rayleigh** scattering

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3. The names of all of the characters in this work except for the protagonists begin with letter "C", including the boss's son Curley and the one-handed Candy, FTPE:

[10] This is what novel in which George and the mentally challenged Lennie are migrant workers in California, with dreams of owning a farm of their own, with a rabbit hutch?

ANSWER: **Of Mice and Men**

[10] *Of Mice and Men* is by this American author who chronicled the Joad family's journey from Oklahoma to California in *Grapes of Wrath*.

ANSWER: John **Steinbeck**

[10] Danny, Pilon, and Pablo are three of the Mexican *paisanos* that drink their way through this Steinbeck novel, set in the titular town, just north of Monterey.

ANSWER: **Tortilla Flat**

4. Answer some questions about chemical reactions FTPE:

[10] This class of reactions involves the exchange of electrons between its reactant molecules. At least one molecule loses an electron while another gains an electron, resulting in multiple oxidation state changes.

ANSWER: **redox** reactions

[10] Complicated redox reactions can be analyzed by writing out these two reactions, each of which includes electrons lost or gained. When combined together, the electron terms should cancel out.

ANSWER: **half**-reactions

[10] In this subclass of redox reactions, a reacting species is both oxidized and reduced, resulting in the formation of two different products.

ANSWER: **disproportionation** or **dismutation** reactions

5. Answer some questions about Latin American civilizations FTPE:

[10] This group of peoples spoke Nahuatl, worshipped Quetzalcoatl, and had their capital at Tenochtitlan. Cortez paid them an unhappy visit in 1519.

ANSWER: **Aztecs**

[10] These people occupied present-day Mexico between about 1400 and 400 BC. They are famous for their artwork, particularly their colossal heads.

ANSWER: **Olmecs**

[10] Scholars still wonder if this civilization was a legend created by the Aztecs. It was based in Tula and ruled by Mixcoatl and Topiltzin Quetzalcoatl.

ANSWER: **Toltecs**

6. Identify some stuff about Kafka works, FTPE:

[10] This novel, Kafka's last, describes K.'s attempts to be appointed to the post of land surveyor for the titular structure.

ANSWER: *The Castle*

[10] Characters in this Kafka work include the painter Titorelli, the protagonist's landlady Frau Grubach, and Josef K. who is never told what crime he is being accused of having committed.

ANSWER: *The Trial*

[10] Kafka's most-read work is *The Metamorphosis*, in which this wakes up one morning to find himself transformed into an insect.

ANSWER: **Gregor Samsa**

7. Answer these related questions about diseases FTPE:

[10] This mosquito-borne condition caused by certain species of *Plasmodium* can be treated with derivatives of artemisinin and quinine. Most commonly found in parts of Africa and Asia, it can be prevented with doses of mefloquine or doxycycline.

ANSWER: **malaria**

[10] Though malaria affects all individuals, those who are carriers of the sickle cell trait have demonstrated resistance against its disease progression. This is a classical example of this phenomenon in which greater fitness is accorded to those with only the dominant or recessive alleles of a gene.

ANSWER: **heterozygote advantage** or **heterozygous advantage**

[10] This disease's persistence has been explained by some as an example of heterozygote advantage—those with this condition are hypothesized to have resistance against cholera. Its chloride ion transport problems leading to excess mucus production could be beneficial in reducing water loss through the diarrhea caused by cholera.

ANSWER: **cystic fibrosis** or **CF**

8. Scramblin' for Africa, FTPE:

[10] This 1884 conference organized by the German Chancellor Otto von Bismarck regulated the rules of colonization and attempted to eliminate African autonomy and self-independence.

ANSWER: Congress of **Berlin**

[10] The founder of De Beers Diamond Company, this English businessman and enthusiastic supporter of colonialism supported such imperialist initiatives as the Jameson Raids in South Africa.

ANSWER: Cecil **Rhodes**

[10] This 1898 territorial dispute over a Sudanese town originally called Kodok almost brought Great Britain and France to the brink of war. The UK eventually succeeded in defusing tensions.

ANSWER: **Fashoda** Incident

9. In one story by this author, a girl cuts off her cousin's pigtailed while running away from home after cousin tricks her into performing the titular action and in another story a girl captured by "pirates" falls in love with the captain while on a trip to Florida, FTPE:

[10] "Bernice Bobs Her Hair" and "The Offshore Pirate" both appear in "Flappers and Philosophers" a short-story collection by this American author.

ANSWER: F. Scott **Fitzgerald**

[10] By far Fitzgerald's most popular work is this novel, a "Jazz-age" story narrated by Yale graduate Nick Carraway about the titular rich playboy who lives on West Egg and courts Daisy Buchanan.

ANSWER: *The* **Great Gatsby**

[10] This other novel, Fitzgerald's first, is largely based on his real-life experiences with future wife Zelda Sayre. In it's first section: The Romantic Egotist, Amory Blaine attends Princeton and falls in Love with Isabelle Borge, but is ultimately rejected.

ANSWER: **This Side of Paradise**

10. Name the following South Asian religions, for ten points each:

[10] This major religion of the Punjab is a blend of Hinduism and Islam. Its founder was Guru Nanak and its primary scripture is the Guru Granth Sahib. Its holiest site is the Golden Temple of Amritsar.

ANSWER: **Sikhism**

[10] This South Indian religion founded by Mahavira places great emphasis on the concept of ahimsa, or nonviolence.

ANSWER: **Jainism**

[10] This faith founded in the 19<sup>th</sup> century by Baha'u'llah claims that all religions are paths toward God.

ANSWER: **Baha'i**

11. For ten points each, name this mythical people who were transformed into plants:

[10] This daughter of Peneus and Creusa was pursued by Apollo, but turned into a laurel tree when she spurned his love.

ANSWER: **Daphne**

[10] This self-absorbed youth ignored the love of the nymph Echo, and was turned into a flower because he spent so much time by a pond admiring his own reflection.

ANSWER: **Narcissus**

[10] This youth loved by Apollo was killed when the west wind Zephyr blew the god's discus at this boy's head. Upon his death he was transformed into a flower.

ANSWER: **Hyacinth**

12. Answer some questions about some novels of social protest, FTPE:

[10] Abraham Lincoln called this author "the little lady who started this great war" for a certain novel she wrote about a slave belonging to Simon Legree.

ANSWER: Harriet Beecher **Stowe**

[10] Upton Sinclair wrote this novel about corruption in the Chicago meatpacking industry in this novel, which spurred on the passage of the Pure Food and Drug Act.

ANSWER: *The* **Jungle**

[10] This late 19<sup>th</sup> century American author wrote about socialist utopias in his novels *Looking Backward* and *Equality*.

ANSWER: Edward **Bellamy**

13. FTPE, answer some questions about the Byzantine Empire.

[10] Basil II Porphyrogenitus gained his rather more unique and exciting nickname for defeating this Turkic people who founded khanates near the Volga, Caspian, and in the southeastern Balkans, a country which now bears their name.

ANSWER: **Bulgars** (also accept **Bulgarians**)

[10] Leo III the Isaurian was a leader of this movement which rejected religious images as a violation of the Decalogue prohibition of graven images.

ANSWER: **Ikonoqlasm** or **Ikonoqlasts**

[10] This chemical incendiary of unknown composition was used to great effect by the Byzantines, particularly in naval battles with the Arabs where it was instrumental in preventing the Empire from being overrun.

ANSWER: **Greek fire** or **sea fire** or **Roman fire** or **war fire** or **liquid fire** or **processed fire** or anything Greek with the word **pur**

14. It's that time of year again: March Madness. FTPE:

[10] This overall number one seed fell in the second round in a shocking upset to Northern Iowa, on a highly publicized shot by Ali Farouknamesh

ANSWER: **Kansas** Jayhawks (do not accept or prompt on Kansas State)

[10] This other number 1 seed is now the favorite to win the tournament, with a load of freshman stars like John Wall and DeMarcus Cousins.

ANSWER: **Kentucky** Wildcats

[10] This team from the MAC conference pulled off the biggest first round upset when they upset 3-seeded Georgetown

ANSWER: **Ohio** Bobcats

15. His namesake hierarchy, sometimes also named for Schützenberger, organizes grammars into four types, each more specific than the last. For 10 points each:

[10] Identify this MIT linguist also known for his political activism and for discussing the grammatical but meaningless sentence "Colorless green ideas sleep furiously."

ANSWER: Noam **Chomsky**

[10] Chomsky introduced this conception of grammar, which explains the relationship between the deep structure and surface structure of a sentence in a given language.

ANSWER: **transformational grammar** (or **transformational-generative grammar** or **TGG**)

[10] Chomsky's work in this area falls into this subfield of linguistics, which studies the rules for constructing sentences and is a part of grammar.

ANSWER: **syntax**

16. Identify the following British composers, for 10 points each.

[10] His interest in Hinduism resulted in the opera *Savitri*, and he used a 5/4 time signature for "Mars, the Bringer of War," from his suite *The Planets*.

ANSWER: Gustav **Holst**

[10] He paid tribute to earlier English composers with his *Nocturnal after John Dowland* for solo guitar and a piece based on a theme from Henry Purcell's *Abdelazar*, *The Young Person's Guide to the Orchestra*.

ANSWER: Benjamin **Britten**

[10] Ralph Vaughan Williams wrote a fantasia on a theme by this Renaissance composer of the 40-part motet *Spem in alium*.

ANSWER: Thomas **Tallis**

17. Name these significant military operations of World War II, FTPE:

[10] This decisive 1942 battle affirmed the superiority of the Royal Air Force over the German air force Luftwaffe and showed that Britain was well-equipped to handle German's trademark blitzkrieg invasion.

ANSWER: Battle of **Britain**

[10] One of the last significant battles of the war, Germany launched this final offensive push against the Allied powers after Operation Overlord. Germany, however, was unsuccessful in this objective, and the Allies quickly pushed on to liberate Berlin.

ANSWER: Battle of the **Bulge**

[10] This hypothetical amphibious and airborne invasion of Great Britain planned by Hitler was supposed to be put into effect after Germany's eventual victory at the Battle of Britain.

ANSWER: Operation **Sea Lion**

18. This man series Detroit Industry contains 27 scenes depicting the inner workings of the Ford Motor Company. FTPE:

[10] Identify this artist of Man at the Crossroads, and Man, Controller of the Universe, a prominent Mexican Muralist.

ANSWER: Diego **Rivera**

[10] For another Ten points, give the name of this wife of Rivera, whose paintings often depict her struggling with a lifelong injury she sustained in a bus crash. She did a self-portrait with thorns and Hummingbird.

ANSWER: Frida **Kahlo**

[10] For a final ten points, identify this Mexican social Realist painter, who did a series of murals on Mexican history, called the Epic of American Civilization, and which includes such works as the Coming of Quetzalcoatl and Man on Fire

ANSWER: Jose Clemente **Orozco**

19. The thread of this poem is told to the narrator by a traveler he met “from an ancient land”, FTPE:

[10] This is what poem in which the traveler describes a ruined statue of the titular pharaoh which has inscribed on its base the words: “Look on my works, ye Mighty, and despair”.

ANSWER: “**Ozymandias**”

[10] “*Ozymandias*” is one of the most anthologized poems of this English Romantic poet, who also wrote *To a Skylark* and was the husband of the author of *Frankenstein*.

ANSWER: Percy Bysshe **Shelley**

[10] This Shelley poem in five cantos describes the title entity shaking “the tangled boughs of Heaven and Ocean” and asks “If Winter comes, can Spring be far behind?”

ANSWER: “**Ode to the West Wind**”

20. FTPE, name some people involved in the Third Crusade.

[10] This English king, the eldest son of Henry II, led the English forces on the Third Crusade.

ANSWER: **Richard I** or **Richard Lion-Heart** or **Richard the Lion-hearted** or **Richard Coeur de Leon** Plantagenet

[10] This successful French king and erstwhile enemy of Richard led the French troops. Later in his reign, this king would defeat a coalition led by King John of England at the Battle of Bouvines.

ANSWER: **Philip II** or **Philip Augustus**

[10] This Sunni Kurd and first Ayyubid sultan led the successful Muslim defense of the Holy Land, and was notable both for his strategic success and his adherence to the principles of chivalry.

ANSWER: **Saladin** or **Salah ad-Din**

21. Given the following measurements in terms of their SI base units, name that physical concept:

[10] Kilograms times meters per seconds squared ( $\text{kg}\cdot\text{m}/\text{s}^2$ ).

ANSWER: **force**

[10] Candela.

ANSWER: **luminous intensity**

[10] Kilogram times meters squared over seconds cubed times ampere squared ( $\text{kg}\cdot\text{m}^2/\text{s}^3\cdot\text{A}^2$ ).

ANSWER: **resistance**