1. A diagram system for one art form involving this material was popularized by Samuel Randlett and Robert Harbin and invented by Akira Yoshizawa. The Japanese Pavilion at Expo 2000 and a temporary 1995 building for the Takatori Catholic Church were designed out of this material by Shigeru Ban. Hanji is a type of this material made in Korea, similar to the Japanese washi. Colored pieces of this material are adhered to objects in decoupage. Henri Matisse painted pieces of this material with gouache in cut-outs like his *Blue Nude* series. Another art form based on this material uses folds like "mountain" and "valley" to make figures like cranes. For 10 points, name this material that is used in origami and often made from dried wood pulp.
ANSWER: **paper** [accept **cardboard**] <Kothari>

2. An artist from this country created many paintings of nude women and oblivious clothed men roaming classical landscapes, such as *Entrance to the City*. Another artist from this country depicted his grandmother entering a room where his alcoholic father sits despondent in his canvas *Scandalized Masks*. Twenty artists from this country formed the group *The Twenty*, and were led by the painter who depicted a procession under a banner reading "Viva la sociale" in *Christ's Entry into* this country's capital. A surrealist from this country painted several raining men in *Golconda*, which like his *The Son of Man* showcases his love of bowler hats. For 10 points, name this home of country of Paul Delvaux, James Ensor, and Rene Magritte.
ANSWER: **Belgium** [or Kingdom of **Belgium**; or Koninkrijk **Belgie**; or Royaume de **Belgique**; or Konigreich **Belgien**] <Gupta>

3. A field whose amplitude is given by a Bessel function of the first kind would anomalously not demonstrate this effect. An equation for this phenomenon has a leading term of i over lambda times the surface integral of the average of the cosine of two angles, and is derived using two of Kirchoff's boundary conditions. Under the paraxial approximation, this phenomenon is governed by an equation with a sinc squared term applied to a variable symbolized beta. The equation 2 d, sine theta, equals n lambda is used to describe how it distinguishes crystal structures. This phenomenon and interference create alternating light and dark bands on the far screen in Young's double-slit experiment. For 10 points, name this process in which light bends around an obstacle.
ANSWER: **diffraction** [prompt on **interference**] <Silverman>

4. One of these poems calls the clouds of Albion "begetters of our deep eternal theme" and asks, "Give me new Phoenix wings to fly at my desire." Another of these poems imagines tracing the shadows of a high romance and ends with the speaker describing standing alone and thinking "till love and fame to nothingness do sink." These poems include "On Seeing the Elgin Marbles." The image of Cortez's men "silent, upon a peak in Darien" ends one of these poems that begins, "Much have I travell'd in the realms of gold." These poems include one beginning, "Bright star! would I were steadfast as thou art," and "On First Looking into Chapman's Homer." For 10 points, name these 14-line poems by the author of "Ode on a Grecian Urn."
ANSWER: John **Keats's sonnets** [or obvious equivalents; prompt on John **Keats's poems**; prompt on **sonnet**s]
<Sy>

5. A mythical being from this modern-day country sleeps with a prostitute multiple times, but each time preserves his essence by never ejaculating. In this country's myths, a sea monster rams into a mountain, which knocks the earth off balance until a turtle's legs are used as pillars to hold up the sky. The creation myth of this country concerns a horned, hairy giant that emerges from a primordial egg. In the mythology of this country, a goddess floats to the moon after drinking an elixir of immortality belonging to her husband, who shoots down nine suns from the sky to cool down the Earth. For 10 points, name this modern-day country whose Eight Immortals and Jade Emperor have their roots in Taoism.
ANSWER: **China** <Kim>

6. This industry was controlled by businessmen called "Randlords." A surge in this industry was centered on Witwatersrand and led to the foundation of the Ferreira's Camp district. Workers in this industry developed the pidgin language Fanagalo and participated in a 2012 strike against Lonmin. Some of those strikers in this industry were killed by police in the Marikana massacre. This industry led to the growth of Johannesburg. De Beers, a company in this industry, was founded by Cecil Rhodes and operates a facility at Kimberley. For 10 points, name this industry that produces ores and precious gems.
ANSWER: South African **mining** [or specific types of mining, such as **diamond mining** or **gold mining**]
<Golimlim>

7. People ancestrally from this modern-day country were killed by nationalists in pits called *foibe*. The Treaty of Osimo partitioned a territory shared by this country and its eastern neighbor. Mark Clark inexplicably led the U.S. Fifth Army away from a retreating army in this country following the success of Operation Diadem. The Gothic Line, the site of the last major action for an entirely Japanese-American regiment, was constructed in this country. In this country, a Benedictine monastery was bombed during a campaign that also included the Battle of Anzio. Following World War II, a city now in this country became the U.N.-controlled Free Territory of Trieste **(tree-EST)**. For 10 points, name this country where the Battle of Monte Cassino took place.
ANSWER: **Italy** [or **Italian Republic**; or **Repubblica Italia**na] <Golimlim>

8. In the eighteenth century, this lake was allegedly where a wooden tablet with an image of the Virgin Mary drifted up next to a washerwoman named Maria Cardenas. Nancy Wexler has studied the oddly high prevalence of Huntington's disease among the native population along this lake's shore. An Esso tanker once collided into the Rafael Urdaneta Bridge crossing this lake's outlet. In 2004, nearly twenty percent of this lake quickly became covered in duckweed. A significant amount of thunderless lightning occurs where the Catatumbo River empties into this lake. This lake's palafitos, or stilt houses, led Amerigo Vespucci to name its surrounding region "Little Venice." For 10 points, name this lake in Venezuela that is the largest in South America.
ANSWER: Lake **Maracaibo** [or Lago de **Maracaibo**] <Gehring>

9. Along with a phosphate, this ion coordinates adenosine in a compound used to make ATP during pyrosequencing. Its ammonium salt is used to salt out proteins. The proteoglycans heparan and chondroitin are found bound to this anion. This ion is the hydrophilic group in a lysing agent added before polyacrylamide gel electrophoresis. In that case, it's coordinated to a sodium dodecyl cation. Barium precipitates out this ion, whose anhydrous magnesium form is an ubiquitous drying agent. Gypsum is the calcium salt of this anion, and its monoprotic and diprotic acids are both strong. For 10 points, name this oxide of sulfur VI **(six)**, a divalent anion with formula SO4 two minus.
ANSWER: **sulfate** [or **SO_4** 2 minus until it is read; do not accept or prompt on "sulfite" or "bisulfate"] <Silverman>

10. A man in this novel begins to tell a story about the King of Bohemia's seven castles, but ends up describing his sexual encounter with a nun who vigorously caresses his knee. A clergyman in this book supports the training of a midwife in his town so that people will stop using his horse to get to the doctor. In the first volume of this novel, the narrator explains "hobby-horses." In this novel, a character builds replicas of the Siege of Namur after moving to the country on the advice of Corporal Trim. A falling window sash causes the accidental circumcision of this novel's title character, whose Uncle Toby is the focus of much of its second half. For 10 points, name this long, digressive novel by Laurence Sterne.
ANSWER: ***Tristram Shandy*** [or *The Life and Opinions of **Tristram Shandy**, Gentleman*] <Sy>

11. A character originally from this literary work inspired a suite whose fifth movement calls for four small orchestras to play independently of each other to depict a hectic "Marketplace in Ispahan." That suite opens with an "Oriental Festival March" and is by Carl Nielsen. This literary work inspired a theme in which harp glissandos accompany an undulating *Lento* recitative for solo violin that begins with a long, high E. That theme, which is reprised in a movement portraying a ship crashing against a cliff following a "Festival at Baghdad," depicts a woman whose menacing husband is introduced in the movement "The Sea and Sinbad's Ship." For 10 points, name this literary collection that inspired Nikolai Rimsky-Korsakov's *Scheherazade*.
ANSWER: The ***Arabian Nights*** [or *The **One Thousand and One Nights**;* or *Kitab **alf laylah wa-laylah**;* prompt on "**Aladdin**"] <Kim>

12. In 1982, this thinker claimed that Communism was "the most successful variant of Fascism." In a *Partisan Review* essay, this author wrote that "the white race is the cancer of human history." This person directed a candlelit performance of *Waiting for Godot* during the 1990s Siege of Sarajevo. In an essay, this thinker claimed that Hitchcock's films fell into "self-parody" and could not be part of the title canon. This author wrote a 1978 text that notes how both tuberculosis and cancer were once linked to a person's psychological traits. She produced a series of theses that define picture postcards as part of the title "love of the unnatural." For 10 points, name this writer of the book *Illness as Metaphor* and the essay "Notes on 'Camp.'"
ANSWER: Susan **Sontag** [or Susan **Rosenblatt**] <Cheyne>

13. In an 1882 political cartoon from *The Punch*, this man was depicted as Frankenstein trying to stop Frankenstein's monster. With Timothy Healy and John Dillon, this leader traveled to America to fundraise for relief. Due to the shortcomings of the 1881 Land Act, this man was one of six imprisoned for signing the "no rent manifesto." The reputation of this man was tarnished by a letter forged by Richard Pigott, which appeared to condone the murders of Thomas Burke and Lord Cavendish in Phoenix Park. His fall from politics was completed when his affair with Kitty O'Shea was made public in a divorce suit. For 10 points, name this first president of the Irish National Land League, who advocated for home rule.
ANSWER: Charles **Parnell** [Charles Stewart **Parnell**] <O'Rourke>

14. Quanto's Law was passed in this country after the law's namesake, a police dog, was stabbed by a criminal high on drugs. Red squares were worn by students during a 2012 protest in this country that led to a ban on wearing masks during riots. In June 2015, this country passed a widely-criticized anti-terrorism bill that will increase the powers of CSIS. In October 2014, two military officers in this country were hit by a car outside a shopping mall two days before Michael Zehaf-Bibeau killed a guardsman on Parliament Hill; both lone-wolf attacks were conducted by ISIS supporters. For 10 points, name this country that supplies its only neighboring country with oil through the Keystone Pipeline.
ANSWER: **Canada** <Golimlim>

15. A man in this novel offers the protagonist a sniff of cocaine-laced powder from his gold snuffbox during a heated conversation. Mankind and machines are locked in an apocalyptic struggle in a scene from this novel, in which the protagonist sees a door reading "ALL GIRLS ARE YOURS." The protagonist of this novel is dissuaded from committing suicide by a girl with whom he learns the fox-trot, and receives an invitation reading "For Madmen Only -- Price of Admission Your Mind," to a place where he commits a murder with a knife that appears in his pocket. After the Fancy Dress Ball, the saxophonist Pablo invites this novel's protagonist into the Magic Theater, where he kills Hermine. For 10 points, name this novel about the half-beast Harry Haller, by Hermann Hesse.
ANSWER: *Steppenwolf* [or *Der Steppenwolf*] <Gupta>

16. In 2014, this man's daughter provoked a scandal by personally participating in a revenge killing during the research for her ethnography of Philadelphia, *On the Run*. This writer described six patterns for how women behave in commercials and billboards in his book *Gender Advertisements,* and argued that people interpret political events through what he called their "primary frame." In his major work, this sociologist argued that the protection of "secrets" was necessary for the preservation of a "team," whose "front stage" activity differs from its "back stage." In that book, this sociologist analyzed the concept of "impression management" and used analogies from the theater to model the way people put on roles in front of others. For 10 points, name this sociologist who developed the "dramaturgical model" of social interaction in *The Presentation of Self in Everyday Life*.
ANSWER: Erving **Goffman** <Bollinger>

17. The second Storegga event resulted in one of these phenomena. These phenomena can create symmetrical examples of parabolic dunes that contain angular clasts or mud in addition to sand and are named chevrons for their inverted-v shape. An intensity scale for these phenomena was devised by Soloviev. The PTWC was founded after one of these phenomena devastated Hilo. Their deposits are difficult to distinguish from those left by hurricanes because both deposit continuous and discontinuous sand sediments, sometimes with isolated boulders, across large areas of coast. These natural hazards are shallow water waves even in the deep ocean due to their long wavelength. For 10 points, name these fast moving waves, created by submarine landslides and earthquakes, that can devastate coasts.
ANSWER: **tsunami**s [or **seismic sea wave**s; prompt on **harbor wave**s or **earthquake**s] <Voight>

18. Some cyanobacteria possess a gas-permeable type of this structure comprised of stacks of cylindrical gas vesicles. Acido-calcisomes were first discovered near a type of this structure in trypanosomes. Its parasitophorous type forms during invasion and protects apicomplexan parasites from host attack. Inorganic ions are found in this structure's "cell sap". It may store anthocyanins and other colorful flavonoids. This organelle's central type is surrounded by the tonoplast, and osmoregulation is performed by its contractile type to prevent lysis. It maintains turgor pressure in plants. For 10 points, name this large vesicle that functions as a storage compartment and takes up much of the volume of plant cells.
ANSWER: **vacuole** [or central **vacuole**; or gas **vacuole**; or contractile **vacuole**; or **vacuolar** membrane; prompt on **tonoplast** until "cell sap" is read; prompt on **vesicle** until it is read] <Smart>

19. Nick Berg was killed as revenge for what happened at this place. A Seymour Hersh article blamed events here on a secret program called "Copper Green." A cover of The Economist featured a photo of this place with a caption urging a Cabinet member to "RESIGN." When talking about this place, Rush Limbaugh asked "you ever heard of emotional release?" and compared it to the "Skull and Bones initiation." Lynndie England was sentenced to prison for her actions here, which included giving the thumbs up in photos next to a pyramid of naked people. For 10 points, name this prison complex where Iraqi prisoners were abused by U.S. soldiers.
ANSWER: **Abu Ghraib** prison [or **Baghdad Central** prison; or **Father of Raven**; or **Place of Raven**s] <Cheyne>

20. In this play, a woman decides that normal human relationships are "two by two" after being told that she is about to lose one of her chicks. Another woman in this play says that people are "shut up in little boxes," and asks her father to take her away on her wedding day. The first scene of this play includes a description of the Polish Town and a prediction of when the first car will appear in this play's setting. At the end of this play, a dead woman returns to one of her birthdays, and asks if humans ever "realize life while they live it." Howie Newsome serves as the milkman of this play's setting, the hometown of George Gibbs and Emily Webb. For 10 points, name this play set in Grover's Corners by Thornton Wilder.
ANSWER: _**Our Town**_ <Sy>

21. This place was adjacent to a well where the water goddess Coventina was worshiped. Information about this place was found on the Rudge Cup. The creation of this place is referenced in a limerick which prompted its designer to write "I don't want to be a Florus, please." A revolt near this structure signaled the beginning of the Great Conspiracy, which was put down by Count Theodosius. A birthday invitation was found on one of the Vindolanda tablets, which were unearthed near this structure. The creator of this structure later established the Panhellenion in Greece and put down the Bar Kokhba revolt. This structure was intended to stop Pictish raids from Caledonia. For 10 points, name this fortification supplemented by one built by Antoninus Pius, a wall in northern Britain sponsored by a "good" Roman emperor.
ANSWER: **Hadrian's Wall** [or Vallum **Aelium**] <Brownstein>

1. Near the end of this film, Lacenaire makes no attempt to flee the Turkish bath where he had just murdered the count, and Nathalie escapes into a Carnival crowd replete with Pierrot masks. For 10 points each:
[10] Name this epic film directed by Michael Carne, often called the greatest French film ever made, which focuses on the courtesan Garance and the four men courting her. It was produced in 1945 during Nazi occupation.
ANSWER: Les *Enfants du Paradis* [or *Children of Paradise*]
[10] Actor Robert le Vigan abandoned his role in the film as the clothes-peddler Jericho because he was sentenced to death by the Resistance, and was replaced by this director of *The Grand Illusion* and *The Rules of the Game*, whose father was a famous Impressionist painter.
ANSWER: Jean **Renoir**
[10] The American trailer for *Children of Paradise* called it the French answer to this 1939 David Selznick-directed movie, in which the Clark Gable-portrayed Rhett Butler says "Frankly, my dear, I don't give a damn."
ANSWER: *Gone with the Wind* <Gupta>

2. The grey crescent appears when cortical rotation in frogs establishes this axis, which Hans Spemann found could be duplicated by transplanting a portion of the blastopore lip. For 10 points each:
[10] Name this two-part axis that in *Drosophila* is partly formed by a graded distribution of the *spaetzel* ligand, similar to the function of bicoid in anterior-posterior patterning.
ANSWER: **dorsal-ventral** axis [accept in any order; prompt on partial answers]
[10] This protein is localized via cortical rotation to dorsal oocyte nuclei, where it's needed for dorsalization. It also forms part of a destruction complex in the Wnt pathway and links cadherin to a related "alpha" protein attached to actin to make adherens junctions.
ANSWER: **beta-catenin**
[10] Cortical rotation is driven by these structures comprised of tubulin dimers. The motor proteins dynein and kinesin walk along this structure in the cytoskeleton, and they make a "9+2" arrangement in flagella.
ANSWER: **microtubule**s <Smart>

3. This character oafishly keeps his first wife's bridal bouquet in his bedroom, and in one scene, he eats from a basket of apricots without realizing that a letter is hidden underneath. For 10 points each:
[10] Name this henpecked husband and doctor from an 1856 novel, who botches an experimental surgical technique to correct Hippolyte's club foot.
ANSWER: **Charles** Bovary [or Charles **Bovary**]
[10] Charles Bovary marries Emma Rouault in this author's *Madame Bovary.*
ANSWER: Gustave **Flaubert**
[10] In a notoriously erotic scene, Emma's letter rejecting Leon is torn up and scattered to the winds as the two of them have sex in one of these locations.
ANSWER: a **carriage** [or a **coach**] <Gupta>

4. Answer the following about the sodium carbonate salt natron, for 10 points each.
[10] Natron takes its name from Wadi El Natrun, a valley west of this river's delta. This river's "Blue" and "White" tributaries meet near Khartoum.
ANSWER: **Nile** River
[10] Lake Natron, a breeding ground for massive flocks of flamingos, lies in this east African country's Arusha region.
ANSWER: **Tanzania** [or United Republic of **Tanzania**]
[10] Natron deposits are found in the caldera of Emi Koussi **(EH-mee KOO-see)**, a volcano in the Tibesti Mountains of this country. This country fought in the Toyota War to preserve its northern Aouzou **(OW-zoo)** Strip.
ANSWER: **Chad** [or Republic of **Chad**; or Republique du **Tchad**; or Jumhuriyat **Tshad**] <Golimlim>

5. This agency operates MODIS using its research products Terra and the A-train member Aqua. For 10 points each:
[10] Name this US governmental agency that operates the Earth Observing System satellite series as part of its Earth Science Enterprise.
ANSWER: **NASA** [or **National Aeronautics and Space Administration**]
[10] Terra also carries equipment for CERES, a climatological experiment measuring radiant energy and the properties of these structures. The CALIPSO instrument CALIOP uses LIDAR to profile aerosols and these structures, and the AIM satellite studies the noctilucent, or polar mesospheric, type.
ANSWER: **cloud**s
[10] Terra and Aqua have this type of geocentric orbit that maintains a consistent illumination angle and precesses only once per year. Some nearly-polar and walking orbits are of this type.
ANSWER: **sun-synchronous** [or **heliosynchronous**] <Smart>

6. Answer the following about Gnostics, for 10 points each.

[10] Many Gnostic texts were uncovered in this Middle Eastern country at Nag Hammadi. Christian orthodoxy was enforced here early on by Athanasius and Cyril, bishops of Alexandria.

ANSWER: **Egypt**

[10] Some Gnostics personified this emanation of God's wisdom as an "aeon" or fallen spirit who helped shape the world. She represents a type of knowledge distinct from *gnosis*.

ANSWER: **Sophia**

[10] This Princeton professor of religion popularized serious academic study of the Gnostic gospels in such texts as *Reading Judas: The Gospel of Judas*.

ANSWER: Elaine **Pagels** <Jackson>

7. Answer the following about the children of Poseidon, for 10 points each:

[10] Poseidon is the father of Arion, an immortal, talking variety of this animal, four of which are owned by the giant Diomedes.

ANSWER: **horse**s [or **mare**s; or **Mares of Diomedes**]

[10] This god is imprisoned in a bronze jar for three months by Poseidon's sons Otus and Ephialtes.

ANSWER: **Ares** [or **Mars**]

[10] Poseidon is also the father of Antaeus, a giant who is enormously strong so long as this condition is met.

ANSWER: he is **touching the earth** [or he is **touching Gaia**; or obvious equivalents] <Kim>

8. In Tacitus's *Agricola*, the Caledonian chieftain Calgacus declares that the Roman armies "make a wilderness" and call it this other thing. For 10 points each:

[10] Name this state of human affairs. Augustus commissioned an Altar of this thing as part of his improvements to the Forum.

ANSWER: **peace** [or **pax**; or Altar of **Peace**; or Ara **Pacis**; or "solitudinem faciunt; **pacem** appellant"]

[10] Augustus shut the gates to a temple of this two-faced god, an extremely rare occurrence, to denote that centuries of near-continuous war had come to an end and peace had been instilled.

ANSWER: **Janus**

[10] According to Encyclopedia Britannica, a period of Roman imperial dominance called the *Pax Romana* ended in this calendar year, in which Marcus Aurelius died and the time of the Five Good Emperors came to a close.

ANSWER: **180** CE <Jackson>

9. This man was expelled from an early church after telling the pastor that God wanted this man to take the pastor's daughter for a wife. For 10 points each:
[10] Name this man born Vernon Wayne Howell, who declared himself the final prophet of the Branch Davidian religious sect. He was frequently accused of child abuse and statutory rape.
ANSWER: David **Koresh**
[10] Koresh was killed along with many of his followers when the FBI besieged his compound near Waco in this southern state.
ANSWER: **Texas**
[10] Prior to the Waco siege, the FBI was involved in a 1992 raid against extremist Randy Weaver which resulted in the death of Weaver's wife and son. That raid occurred at this location in the Idaho panhandle.
ANSWER: **Ruby Ridge** <Cheyne>

10. The book was defaced by Edmund Blunden, who objected to its contents. For 10 points each:
[10] Name this autobiography mostly focusing on the author's service in World War I, written by the author of *The White Goddess*.
ANSWER: ***Good-Bye to All That***
[10] This author of *I, Claudius* wrote *Good-Bye to All That*.
ANSWER: Robert **Graves**
[10] This woman, Graves's lover, collaborated with him on *A Survey of Modernist Poetry*. She wrote *The Telling* and *The Close Chaplet*.
ANSWER: Laura **Riding** [or Laura Riding **Jackson**] <Cheyne>

11. This man coined the term "intuition pumps" to describe intentionally-misleading thought experiments, though he later acknowledged that intuition pumps might be useful tools for thinking. For 10 points each:
[10] Name this cognitive scientist and philosopher at Tufts, who championed evolution as a "universal acid" for melting away bad beliefs in *Darwin's Dangerous Idea*.
ANSWER: Daniel Clement **Dennett** III
[10] Dennett is often called a leader of a "New" form of this stance, the belief that there is no God. Dennett prefers the term "brights" for people with this belief who are also pro-science humanists.
ANSWER: **atheism** [or New **Atheism**; or New **Atheist**s]
[10] This younger New Atheist, the author of *The End of Faith*, got in trouble in 2014 for offhand sexist remarks. He argued that an objective morality exists somewhat like a mathematical function in *The Moral Landscape*.
ANSWER: Samuel B. "Sam" **Harris** <Jackson>

12. This poet wrote a "Study of the Negro Race" in which the title river is "CREEPING THROUGH THE BLACK" and "CUTTING THROUGH THE FOREST WITH A GOLDEN TRACK." For 10 points each:
[10] "Name this poet of "The Congo" who served as a mentor to Langston Hughes and was a pioneer of "singing poetry."
ANSWER: Vachel **Lindsay** [or Nicholas Vachel **Lindsay**]
[10] In "The Congo," this word, stylized in all capital letters, is screamed by "the whistles and the fifes of the warriors" and the "skull-faced, lean witch-doctors."
ANSWER: **BLOOD**
[10] In this Vachel Lindsay poem, the title American president paces up and down near the old court-house, unable to sleep upon the hillside until the goal of "white peace" is reached.
ANSWER: "**Abraham Lincoln Walks at Midnight**" <Sy>

13. While at a screening of *2001: A Space Odyssey* with Sophie, this novel's narrator learns how a town was ruined by the failed musician Mr. Christoff. For 10 points each:
[10] Name this dreamlike novel in which the famous pianist Ryder visits an unnamed European town to perform in its cultural festival.
ANSWER: The ***Unconsoled**
[10] In another novel by the author of *The Unconsoled, The Remains of the Day*, this butler recalls his former employer Lord Darlington, and travels to visit the former housekeeper Miss Kenton.
ANSWER: **Stevens**
[10] This Japanese-British author wrote *The Unconsoled* and *The Remains of the Day*.
ANSWER: Kazuo **Ishiguro** <Yu>

14. Participants in this study were pre-teen boys divided into two teams named "The Rattlers" and "The Eagles." For 10 points each:
[10] Name this experiment that observed the growing hostility between two Boy Scout camps. It was set at a state park in Oklahoma.
ANSWER: **Robbers Cave** study
[10] This conductor of the Robbers Cave study argued that the Rattlers and Eagles would settle their differences to work towards a larger goal or fight a common enemy.
ANSWER: Muzafer **Sherif**
[10] The camps frequently competed in this activity. The Rattlers accused the Eagles of cheating in this game after they sat down and dug their heels into the ground.
ANSWER: **tug-of-war** [or obvious equivalents such as **rope-pulling**] <Saric>

15. The background of this painting features a pair of maids taking clothes out of a bridal chest. For 10 points each:
[10] Name this painting in which a woman clutches a posy of roses and has a spaniel at her feet, possibly signifying fidelity.
ANSWER: *Venus of Urbino*
[10] The *Venus of Urbino* was painted by this Venetian, who depicted a clothed and naked Venus in his *Sacred and Profane Love*.
ANSWER: **Titian** [or Tiziano **Vecelli**]
[10] This other Titian painting, once thought to be the work of his teacher Giorgione, depicts two clothed men, one with a lute, and two naked women as an allegory of Poetry.
ANSWER: Le *Concert champetre* [or *Pastoral Concert*] <White>

16. This directive was issued four days after William Quantrill's band of "bushwackers" massacred over 200 people in a raid on Lawrence, Kansas. For 10 points each:
[10] Name this 1863 directive issued by General Thomas Ewing, Jr. It forced all families living in Bates, Cass, Jackson, and parts of Vernon County to emigrate further south.
ANSWER: **General Order** Number **Eleven**
[10] This Missouri outlaw's mother Zerelda and step-father Ruben Samuel were forced to move to Nebraska by General Order Number 11. He was shot by Robert Ford.
ANSWER: Jesse **James** [Jesse Woodson **James**]
[10] The downfall of the James-Younger gang came in their disastrous attempt to rob the First National Bank in this Minnesota town in 1876. During the raid, the cashier Joseph Lee Heywood was killed and the Younger brothers were captured by the nearby town of Madelia.
ANSWER: **Northfield**, Minnesota <O'Rourke>

17. This piece ends with a "Praise to the Immortality of Jesus" for violin and piano. For 10 points each:
[10] Name this eight-movement chamber piece, composed in a prisoner-of-war camp for the unusual combination of piano, violin, cello, and clarinet.
ANSWER: *Quartet for the End of Time* [or *Quatuor pour la fin du temps*]
[10] The *Quartet for the End of Time* is a piece by Olivier Messiaen, a student of this composer of the tone poem *The Sorcerer's Apprentice*.
ANSWER: Paul **Dukas** [or Paul Abraham **Dukas**]
[10] Messiaen was additionally a skilled performer of this instrument, which produces sound by using keyboards and foot pedals to direct pressurized air through pipes.
ANSWER: pipe **organ** <Kim>

18. This phrase was engraved on medallions depicting a kneeling man clasping together his hands, which are chained to his ankles. For 10 points each:
[10] Give this eight-word question that appeared on images widely distributed by English pottery magnate Josiah Wedgwood to support a cause championed by Thomas Clarkson.
ANSWER: "**Am I not a man and a brother?**"
[10] This cause was eventually achieved in Britain in 1807, with the passage of an act that would be enforced by the Royal Navy's West Africa Squadron.
ANSWER: **abolition of the slave trade** [or obvious equivalents like **outlawing the Atlantic slave trade**; do not accept or prompt on answers like "abolition of slavery" that do not mention the slave trade]
[10] This Parliamentarian and member of the evangelical Clapham Sect worked to abolish the slave trade in 1807. He unfortunately died shortly after the 1833 Slavery Abolition Act was passed.
ANSWER: William **Wilberforce** <Yu>

19. Paul Dirac is credited with inventing the method that uses these constructs. For 10 points each:
[10] Identify these operators that can raise or lower the eigenvalues of another operator. They can be used to derive the energy eigenvalues of a quantum harmonic oscillator.
ANSWER: **ladder** operators [or the **creation** and **annihilation** operators]
[10] The zero-point energy of a quantum harmonic oscillator equals h-bar times this quantity over two. This quantity equals two pi over the period of a cycle and is symbolized omega.
ANSWER: **angular frequency**
[10] Due to the form of the differential equation for the quantum harmonic oscillator, its wavefunction is written in terms of this set of polynomials. These polynomials form an orthogonal set when weighted by the factor e to the minus x-squared.
ANSWER: **Hermite** polynomials <Golimlim>

20. Answer the following about groups, for 10 points each.
[10] Cayley's theorem says that every finite group is isomorphic to a subgroup of the group of these things. An action of this type takes n items and re-orders them in one of n-factorial ways.
ANSWER: **permutation**s [or **permutation** group]
[10] For n greater than or equal to five, the group of permutations of this type, known as the alternating group, is simple. Permutations of this type have sign equal to positive one.
ANSWER: **even** permutations
[10] Field extensions are associated with groups named for this French algebraist, who famously died at age 20 in a duel that was, probably, over a woman.
ANSWER: Evariste **Galois** <Schindler>

21. The power emitted by these things is given by the Stefan-Boltzmann Law. For 10 points each:

[10] Name these perfect absorbers of radiation, for which Planck's law describes the amount of radiation emitted.

ANSWER: **black bodies** [or word forms]

[10] The Rayleigh-Jeans law for black bodies caused the ultraviolet catastrophe because it predicted that, for low wavelengths, the spectral radiance of a black body equaled this value.

ANSWER: **infinity** [or **infinite**]

[10] The ultraviolet catastrophe resulted from erroneously applying this theorem, which states that every degree of freedom of a system contributes energy equal to one-half times Boltzmann's constant times temperature.

ANSWER: **equipartition** theorem <Golimlim>