

Tossups

1. In the months preceding this battle, Cuthbert Collingwood's English Channel fleet blockaded the ships commanded by Admiral Villeneuve. Despite Villeneuve's objections, Napoleon ordered Villeneuve to leave the port of Cadiz, and on October 21, his combined French and Spanish fleets were destroyed, even though a shot from the French ship *Redoubtable* mortally wounded the British commander, Horatio Nelson. FTP, what sea battle secured British naval supremacy for another century in 1805?

Answer: Battle of Trafalgar

2. This author's memoir "Towards the Mountain" describes his life up to the time he published his most famous novel. One of the founders of the Liberal Association of South Africa, he wrote a volume of short stories entitled *Tales From a Troubled Land*, and the novels *Too Late the Phalarope* and *Ah, But Your Land is Beautiful*, but is best known for a 1948 novel telling of the Zulu pastor Stephen Kumalo. FTP, name this author of *Cry, the Beloved Country*.

Answer: Alan (Stewart) Paton

3. Diseases associated with this gland include myxedema and Hashimoto's disease. The site of calcitonin production, this gland releases hormones which lower circulating cholesterol levels and regulate the oxygen consumption of cells in adults. Consisting of two oblong lobes connected by a narrow band of tissue, over-activity of this gland can lead to Grave's disease. FTP, name this gland located below the larynx and associated with goiter.

Answer: thyroid gland

4. Featuring music like "Di provenza il mar", "Un di felice eterea", "Imponete", and "Ah fors e lui...", this opera's secondary characters include Baron Douphol and Flora Bervoix. Its action concerns the love of Alfredo Germont for Violetta, a prostitute who rejects Alfredo so as not to "taint" his family's reputation, and who dies of tuberculosis before they can be reunited. FTP, name this 1853 opera based on Dumas fils' novel *La Dame aux Camelias*, composed by Giuseppe Verdi.

Answer: *La Traviata* (or *The Wayward Woman*)

5. From March to December of 1865, John Eaton was assistant commissioner of this agency which, despite inadequate funds and poorly trained personnel, distributed more than 21,000,000 rations to impoverished citizens. Although it failed in its attempts to secure abandoned lands for its constituents and establish a court system before it was abolished in 1872, this bureau was responsible for the construction of numerous hospitals and over 1,000 schools. FTP, name this Reconstruction bureau headed by General Oliver Howard established to provide aid to the 4,000,000 newly freed African-Americans.

Answer: Freedmen's Bureau (or US Bureau of Refugees, Freedmen, and Abandoned Lands)

6. His love of nature can be seen in his descriptions of the countryside near the town of Vaucluse. Writer of the epic poem *Africa* and the unfinished *Trionfi*, he established himself as an early humanist with works like *On His Ignorance and That of Many Others*, *Remedies Against One and the Other Fortune*, and *On Illustrious Men*, and was the first man since ancient times to be crowned with the laurel of a poet in Rome, mainly for his *Canzoniere*. FTP, name this 14th century poet who wrote of his love for Laura.

Answer: Petrarch (or Francesco Petrarca)

7. He fell out of favor with the gods late in life, lost two of his children, and, in his grief, wandered the Aleian Plain. The father of Laodameca and grandfather of Sarpedon, he was loved by Anteia, and when he rejected her advances she tricked her husband, Proteus, into sending him to her father Iobates with a message ordering his death. Iobates then assigned him a series of dangerous tasks, but when he succeeded in them, Iobates offered him his daughter in marriage. FTP, who killed the Chimera after taming Pegasus.

Answer: Bellerophon (or Bellerophontes)

8. Islands found in this body of water include Oland, Bornholm, and the Alands. Difficult to navigate since its low salt content allows rapid freezing, this largest expanse of brackish water in the world is connected

by the Skagerrak Strait to the North Sea. FTP, name this sea whose major affluents include the Neva, Oder, and Vistula, which is bounded by Scandinavia, Russia, Poland, Estonia, Latvia, and Lithuania.

Answer: Baltic Sea

9. Fossilized fragments of a cranium, jawbone, and teeth belonging to this species were found at Barkham Manor near Lewes, Sussex, in 1912. Also known as *Eoanthropus dawsoni* and discovered by Charles Dawson, for a time it rivaled *Homo erectus* as a candidate for the missing link, until it was discovered that the cranium was no more than 50,000 years old and that the jawbone came from an orangutan. FTP, name this famous anthropological hoax.

Answer: Pittdown man (prompt on Dawson's Dawn Man or *E. dawsoni*)

10. Although released in 1899, this book's publisher altered the publication date to read 1900, so that it would be associated with the beginning of the 20th century. Opening with the epigraph "If I cannot bend the gods on high, I will move the infernal powers," it examined the difference between the "manifest content" and the hidden content in what the author calls "the royal road to the unconscious," and introduced the idea of the "Oedipus Complex." FTP, name this seminal work of psychology by Sigmund Freud.

Answer: The Interpretation of Dreams

11. After he is cheated out of his charter-fee by a wealthy American fisherman, the destitute protagonist is forced to smuggle Chinese citizens into Florida, but after gaining his money he puts them ashore in Cuba, murdering a man in the process. After losing his arm running liquor, he takes a job sneaking Cuban revolutionaries back into Cuba, but after they murder his mate he is forced to kill them, only to be mortally wounded in the process, having learned that "a man alone ain't got no chance". FTP, name this novel concerning Harry Morgan written by Ernest Hemingway.

Answer: To Have and Have Not

12. In astronomy, he published *Concerning the Calculation of the Occultations of the Planets*. As a physicist he introduced null systems of point and planes in his *Handbook on Statics*, and in *The Calculus of Centers of Gravity* he introduced homogeneous coordinates into analytic geometry and discussed his namesake net, which later played an essential part in the development of projective geometry, but he is best-known for a topological surface. FTP, identify this namesake of a famous one-sided strip.

Answer: August Möbius

13. Its subjects are organized in the form of an M extending into depth, and in the left background of this painting is a woman in light garb, seemingly out of place amongst the lance and musket wielding soldiers of this 1642 group portrait. Also prominent is Willem van Ruytenburch, the brightly illuminated lieutenant standing to the viewer's right of his captain, Franz Banning Cocq. FTP, name this painting which, until the 1940s, was covered by a dark varnish, a masterpiece by Rembrandt.

Answer: The Night Watch (accept early The Militia Company of Captain Franz Banning Cocq, Preparing to March Out)

14. Seeing their privileged position threatened by the newly formed Eskiinciyan corps, they rebelled against Sultan Mahmud II in 1826, leading to their massacre in the "Auspicious Incident". Originally recruited from prisoners of war, they were formed in the 14th century by Murad I. FTP identify this elite military corps, whose name means "New Force", which for a time was raised by levy from the Christian subjects of the Ottoman Empire, who were then converted to Islam.

Answer: Janissaries (prompt on New Force)

15. Its "Common" version is becoming the standard version. It requires large memory and is slow in executing programs because it is usually processed by an interpreter. Manipulating sequences of items in parentheses, this language's programs also take the form of items in parentheses, resulting in the ability to manipulate itself and other programs, hence its heavy use in artificial intelligence. FTP, name this computer language developed by a team led by John McCarthy, derived from the phrase "List Processing".

Answer: LISP (prompt on List Processing)

16. A narrative of a sea battle written by this man served as the basis for Tennyson's ballad "The

Revenge." He established a literary reputation through his poems "The Lie" and "The Passionate Man's Pilgrimage," helped arrange for the publication of *The Faerie Queene*, to which is prefixed his own sonnet beginning "Methought I saw the grave where Laura lay," and wrote *Discovery of Guiana*, which described one of his voyages to South America. FTP, name this favorite of Queen Elizabeth who responded to a poem by Marlowe in *The Nymph's Reply to the Shepherd*.

Answer: Sir Walter Raleigh

17. His criticism of German organ construction gave birth to the reform of German building techniques, and his book *J.S. Bach, the Musical Poet* was a groundbreaking investigation of Bach's musical word-painting and symbolism. As a theologian, he rejected the historical infallibility of Christ in *The Quest of the Historical Jesus*, and at the age of 30 entered medical school and eventually established a hospital at Lambarene, Gabon. FTP, name this humanitarian who won the Nobel Peace Prize in 1952.

Answer: Albert Schweitzer

18. This astronomer is the namesake of a C-141 jet aircraft specially instrumented for astronomical observations at high altitudes. Director of both the Yerkes and McDonald observatories, he measured the visual diameter of Pluto, discovered carbon dioxide in the atmosphere of Mars, and discovered the moons Nereid and Miranda. FTP, identify this Dutch-American astronomer for whom a hypothetical belt of comets is named.

Answer: Gerard Kuiper

19. One of this province's resistance leaders, Xanana Gusmao, was released from prison in the hopes that he could end the rioting which had resulted in destruction of property including the burning of the home of its spiritual leader, Carlos Belo. Ruled by B.J. Habibie, this province with capital at Dili became the scene of violence after a UN conducted poll revealed overwhelming support for independence some 24 years after being invaded. FTP, name this former Portuguese possession currently ruled by Indonesia.

Answer: East Timor

20. Much of what is known of this emperor comes from the writings of Ammianus Marcellinus, who served under this man during his invasion of Persia, during which he was fatally wounded. Surviving the massacre of Constantine's relatives and living in seclusion until the elevation of his half-brother Gallus, he secured the Rhine frontier and won at Argentorate against the Alamanni as Caesar, was proclaimed emperor by his troops, and was left as sole emperor upon Constantius II's death in November 361. FTP, name this Roman emperor best known today for his public rejection of Christianity.

Answer: Julian the Apostate (or Flavius Claudius Julianus)

21. During the 1630s this author of *Philosophical Rudiments*, fearful of an English Civil War, set to work on the political part of his philosophy in the treatise *The Elements of Law*. When Civil War did break out, he fled to Paris, where he served as tutor to then Prince of Wales Charles II, and published *De Cive*. FTP, name this philosopher who described "the Matter, Form, and Power of a Commonwealth, Ecclesiastical and Civil" in *Leviathan*.

Answer: Thomas Hobbes

22. This king's strongly-Catholic religious policies helped provoke the Revolt of the Moriscos and the Dutch Revolts. He ordered the construction of the famed El Escorial palace, was at various times married to Elizabeth of Valois, Anna of Austria, and Maria of Portugal, the latter of which bore his son Don Carlos, and conquered Portugal in 1580. FTP, name this son of Charles V and husband of Mary I of England, whose attempt to invade England led to the defeat of the Spanish Armada.

Answer: Philip II of Spain (or Philip I of Portugal)

23. Characters in this short story include Mr. Clark of Westburg and the protagonist's betrothed, Elizabeth. These characters, as well as the parishioners of Milford, attempt to convince the protagonist, Parson Hooper, to remove the title object, which Hooper claims is symbolic of the sins which stand between each person and the world. FTP, name this "Twice-Told Tale" written by Nathanael Hawthorne.

Answer: "The Minister's Black Veil"

24. Accounting for the term a divided by V squared found in the identically named equation of state, it is responsible for the lattice energy of molecular crystals and for the nonideal behavior of gases. Inversely proportional in strength to the 7th power of the distance between the atoms or molecules involved, this force is caused by dipole-dipole interaction, dipole-induced dipole interactions, and dispersion forces induced by instantaneous dipoles in atoms. FTP, name this weak attractive force named for the Dutch winner of the Nobel Prize for Physics in 1910.

Answer: van der Waals force

25. In its pure form, this acid used in processing textiles and leather is a colorless, pungent liquid that can blister the skin. Distinguished from other carboxylic acids by its acid strength, reactivity as a reducing agent, and failure to form an anhydride, it gets its common name from its presence in ants. FTP, name this simplest of carboxylic acids with formula HCOOH .

Answer: Formic acid (or methanoic acid)

Bonus Questions

1. FTSNOP, identify these characters from *The Great Gatsby*.

a) (5) This bond-salesman is the narrator of *The Great Gatsby*.

Answer: Nick Carroway

b) (5) Gatsby asks Nick to help him rekindle his romance with this woman, with whom he had an affair years before.

Answer: Daisy Buchanan (or Daisy Fay)

c) (10) Daisy is married to this man.

Answer: Tom Buchanan

d) (10) While Daisy is driving Gatsby's car, she accidentally runs down this woman who, coincidentally, is Tom's mistress.

Answer: Myrtle Wilson

2. FTPE, identify these major rivers of Asia.

a) (10) This river forms from the confluence of the Nmai and Mali rivers and flows 1,350 miles before emptying into the Andaman Sea, making it Myanmar's most important commercial waterway.

Answer: Irrawaddy (or Ayeyarwady)

b) (10) This river begins at the confluence of the Shilka and Argun rivers. It flows generally east and southeast along the Russian-Chinese border to Khabarovsk, Siberia, where it turns northeastward until reaching the Tatar Strait. Name this 1,755 mile-long river.

Answer: Amur (or Hei-Lung or Heilong or Kharamuren)

c) (10) This 1,800 mile-long river forms in the Tibetan Himalayas, runs eastward across southwest China, turns south and enters northeast India, then flows south until it forms a vast delta with the Ganges and Meghna rivers.

Answer: Brahmaputra (or Jamuna or Ya-Lu-Tsang-Pu or Yarlung Zangbo or Tsang-Po)

3. Name the chemist 30-20-10.

a) (30) This scientist recognized goiter as an endemic condition, was the first to distinguish the congenital form of syphilis from the infectious form and showed that it could be treated by controlled doses of a mercury compound, and was the first to attempt to construct a system of grouping chemicals according to their susceptibility to similar processes.

b) (20) This scientist named laudanum and introduced its use in pain-killing, and rejected the view of illness as an imbalance of the four humours. His rejection of classic medicine led him to publicly burn texts by Galen and Avicenna, and his name comes from his boast that he was better than a certain 1st century Roman medical writer.

c) (10) Originally named Theophrastus Bombastus von Hohenheim, this scientist is known today as an alchemist who helped develop the field of chemistry.

Answer: Paracelsus (accept early answer of Theophrastus Bombastus von Hohenheim)

4. On a 10-5 basis, identify these Fyodor Dostoyevsky novels from characters.

a) (10) Nastasha Filippovna, Rogozhin

(5) Prince Myshkin

Answer: The Idiot

b) (10) Lizaveta Nikolayevna, Kirilov, Shatov

(5) Nikolay Stavrogin

Answer: The Possessed or The Demons or The Devils

c) (10) Svidrigailov, Marmeladov

(5) Sonya, Porfiry Petrovich

Answer: Crime and Punishment

5. FTSNOP, name these Abstract Expressionist artists.

a) (5) Before his career was cut short by an automobile accident, this Abstract Expressionist became famous for works like the *Pasiphae* and *Autumn Rhythm*, the latter of which is typical of his "action" paintings.

Answer: Jackson Pollock

b) (10) This Dutch-born painter became one of the leaders of the Abstract Expressionist movement. His "Women" series was criticized for its grotesque, figurative style when first exhibited in 1953, but has now gained widespread acceptance, as has "Excavation" and "Door to the River".

Answer: William De Koonig

c) (15) This Armenian-born painter influenced Abstract Expressionists like Pollock and de Koonig with his spontaneous, organic abstracts, the best-known of which is "The Liver is the Cock's Comb".

Answer: Arshile Gorky

6. FTSNOP, name these descendants of Noah.

a) (10) This oldest son of Noah is said to be the ancestor of the Semites.

Answer: Shem

b) (5/5) These were Shem's two brothers, said to be the father of the Gentiles and the Egyptians, respectively.

Answer: Japheth, Ham (in that order)

c) (10) Ham once viewed Noah drunk and naked, for which Noah cursed this son of Ham, who according to rabbinical tradition was the first of the seven sinners who made idols for the heathens.

Answer: Canaan

7. FTPE, name these tumultuous events from English history.

a) This name is traditionally given to clashes between police and demonstrators in Trafalgar Square on November 30, 1887. It occurred at a meeting called to protest a ban on open-air meetings and the arrest of an Irishman who had been supporting a strike.

Answer: Bloody Sunday

b) Occurring in June of 1780 when the leader of the Protestant Association failed in his attempt to have clauses in the 1778 Catholic Relief Act repealed, these anti-Catholic riots in London caused the breakdown of law and order in the capital for several days.

Answer: Gordon riots

c) This 1819 massacre occurred when Manchester Yeomenry charged into a crowd advocating parliamentary reform, killing eleven. Its name was intended to evoke the memory of Waterloo.

Answer: Peterloo massacre

8. Identify these related terms concerning the functioning of the brain, FTSNOP.

a) (10) This term refers to a brain-generated defect in sounding words.

Answer: aphasia (or dysphasia)

b) (15) The term aphasia may be extended to a group of related disturbances. This term describes the perceptual aphasia marked by the failure to comprehend the significance of a nonlanguage stimulus.

Answer: agnosia (prompt on dyslexia)

c) (5) A specific form of visual agnosia, this condition is characterized by a specific inability or pronounced difficulty in learning to read or spell.

Answer: dyslexia

9. One of the major events of the story of Aeneas is his arrival in Italy. Name these figures who played a role in this event, FTPE.

a) (10) When Aeneas reached the mouth of the Tiber, he was received by this king, whose daughter he would eventually marry.

Answer: Latinus

b) (10) Juno caused this king of the Rutuli to make war against Aeneas and Latinus. The war was resolved by hand-to-hand combat in which this king was slain by Aeneas.

Answer: Turnus

c) (10) Turnus had been rejected by this daughter of Latinus, who married Aeneas, thus accomplishing the union of the Trojans and Latins which would one day produce the Roman people.

Answer: Lavinia

10. Identify the poem from lines, 30-20-10-5.

a) (30) "Approach and read (for thou canst read) the lay,/ Graved on the stone beneath yon aged thorn."

b) (20) "Now fades the glimmering landscape on the sight,/ And all the air a solemn stillness holds,/ Save

where the beetle wheels his droning flight,/ And drowsy tinklings lull the distant folds.”

c) (10) “Far from the madding crowd's ignoble strife,/ Their sober wishes never learned to stray.”

d) (5) “The curfew tolls the knell of parting day”

Answer: “Elegy Written in a Country Churchyard”

11. FTPE, name these acts and treaties from U.S. history, you'll get 5 if you need the year of the act or treaty.

a) (10) Also called the Transcontinental Treaty, this US-Spanish agreement defined the western boundary of the US and saw Spain cede Florida to the US in return for the abandonment of US claims to Texas.

(5) 1819

Answer: Adams-Onis Treaty

b) (10) This bill produced by the Congressional Committee on the Conduct of the Civil War was a plan for reconstruction which was vetoed by Lincoln, who favored a more lenient approach.

(5) 1864

Answer: Wade-Davis Bill

c) (10) The US tariff was raised to an extremely high level by this tariff which aggravated world depression and led to a steep decline in US foreign trade. It was coauthored by the first Mormon elected senator.

(5) 1930

Answer: Smoot-Hawley tariff

12. FTP each, answer the following about an order of insects.

a) (10) This is the order which includes ants, bees, wasps, ichneumon flies, and saw flies.

Answer: Hymenoptera

b) (10) All female insects of the order Hymenoptera possess this organ at the hind end of the abdomen, through which eggs are laid. Consisting of a pair of modified appendages, it is often long and piercing, so eggs can be laid in nearly inaccessible places.

Answer: ovipositor

c) (10) Hymenoptera insects develop from an unfertilized egg, a process known as this.

Answer: parthenogenesis

13. Since everything on the circuit nowadays seems to be about the 20th century, this question writer will take things to their extreme. FTSNOP, name the authors of these 20th century works of literature, all of whose titles are years from the 20th century.

a) (10) The poetry collection *1914*

Answer: Rupert Brooke

b) (5) The novel *1919*

Answer: Jon Dos Passos

c) (5) The novel *1984*

Answer: George Orwell (or Eric Blair)

d) (10) The novel *1985*

Answer: Anthony Burgess (or John Wilson)

14. FTPE, name these important Supreme Court cases.

a) (10) In this case, the executors of the estate of a South Carolinian sued a neighboring state to force payment of claims made against the state. It led to the adoption of the 11th amendment.

Answer: Chisholm v. Georgia

b) (10) After the firm of D.E. Loewe could not be unionized, a nationwide boycott of the firm's products was called for by the defendants in this case, which held that unions are subject to antitrust laws.

Answer: Danbury Hatters' Case or Loewe v. Lawlor

c) (10) The court held that state power to regulate extends to private industries that affect public interests in this 1877 case, the first of the Granger cases. It was prompted after the state involved set maximum rates that private corporations could charge for the storage and transport of agricultural products.

Answer: Munn v. Illinois

15. On a 10-5 basis, name these 17th century composers from works.

a) (10) “Lark” and “Sunrise” Quartets, “Mass in the Time of War”

(5) The "Hen", "Military", "Clock", and "Drum Roll" Symphonies

Answer: Franz Joseph Haydn

b) (10) "Gloria in D", and the concertos "The Hut", "Storm at Sea", and "The Bull Finch"

(5) "The Four Seasons"

Answer: Antonio Vivaldi

c) (10) "French" and "English" Suites, the "Coffee" Cantata

(5) "St. Matthew Passion", "St. John Passion", "Mass in B Minor"

Answer: Johann Sebastian Bach

16. Identify the economist, 30-20-10.

a) (30) One of his important achievements was development of his life-cycle theory, which states that individuals earn wealth during their youth for the purposes of consuming these savings during their old age and not for the purpose of passing the wealth on to their descendants, thus explaining the varying rates of savings in societies.

b) (20) With Merton Miller he developed a theorem stating that the market value of a company's stock depends mainly on expectations of the company's future earning potential.

c) (10) For the above achievements, this Italian-born American economist was awarded the Nobel Prize for Economics in 1985.

Answer: Franco Modigliani

17. (30) Yes, the "It Happened One Night"/"One Flew Over the Cuckoo's Nest"/"Silence of the Lambs" bonus has been done too many times, so let's put a new spin on it. Since these are the only three movies for which the director, lead actor, and lead actress all won Oscars, your job is to name the 6 actors and actresses who won Oscars for these movies. You will receive no points for the first correct, and five points for each subsequent correct answer, with a five point bonus for all six.

Answer: Clark Gable, Claudette Colbert, Jack Nicholson, Louise Fletcher, Anthony Hopkins, Jodie Foster

18. FTPE, name the following related to a certain disease.

a) (10) This is tuberculosis of the lymph nodes of the neck, usually acquired by drinking milk infected with bovine or atypical mycobacteria. For centuries it was held that it could be cured by the touch of royalty.

Answer: King's evil or scrofula

b) (10) The practice of using the royal touch to cure the King's evil died out in England during the reign of William III and Anne. It is believed that the last Englishman to receive the royal touch was this 18th century author of the poems "London" and "The Vanity of Human Wishes" and the satire *Rasselas*.

Answer: Samuel Johnson

c) (10) This group claimed that the power of the royal touch did not descend to William and Anne because they were not the rightful holders of the throne. Name these supporters of James Stuart and Bonnie Prince Charlie, who were crushed at the Battle of Culloden Moor in 1746.

Answer: Jacobites

19. FTP each, name the following concerning a struggle between the Holy Roman Empire and the Papacy.

a) (10) This pope, originally named Hildebrand, was one of the great reform popes of the Middle Ages. Reigning from 1073-85, he is most famous for his feud with Holy Roman Emperor Henry IV over lay investiture.

Answer: Saint Gregory VII

b) (10) In 1077, while journeying to Germany to take action against Henry, Gregory stayed at this fortress built by Atto Adalbert. Henry traveled to this castle as a barefoot penitent, and on January 28, after a three-day wait, received absolution from Gregory.

Answer: Canossa

c) (10) Gregory was invited to Canossa by this woman known as the "great Countess" of Tuscany, who was intermittently at war with Henry from 1080 until 1106. An active leader who would sometimes lead her troops in person, this granddaughter of Atto Adalbert was held in such high esteem by the papacy that her remains were removed to Rome in 1634 and reinturned in St. Peter's.

Answer: Matilda of Canossa

20. F15PE, name these authors of novels concerning the biblical figure Barabbas.

a) (15) This author of the 1950 novel *Barabbas* would go on to win the Nobel Prize for literature the next year.

Answer: Par Lagerkvist

b) (15) This popular author of romantic melodramas penned *Barabbas: A Dream of the World's Tragedy*, in addition to other popular but critically panned works like *The Sorrows of Satan* and *The Murder of Delicia*.

Answer: Marie Corelli (or Mary Mackay)

21. FTPE, name these statistical distributions.

a) (10) This is the discrete probability distribution for the number of successes when n independent experiments are carried out, each with the same probability p of success, and is denoted by $B(n,p)$.

Answer: Binomial distribution

b) (10) This distribution gives the number of occurrences in a certain period of an event which occurs randomly but at a given rate. Named for the French mathematician who formulated the law of large numbers, it can also be used to approximate the binomial distribution.

Answer: Poisson distribution

c) (10) This is a continuous distribution of a random variable with its mean, median, and mode equal. Denoted $N(\mu, \sigma^2)$, it is widely used because many experiments produce data that approximate its distribution, and because it is the limit of the Binomial, Poisson, and Chi-squared distributions.

Answer: normal or Gaussian distribution

22. Answer the following from physics, FTPE.

a) (10) This is a hypothetical object that completely absorbs all thermal radiation striking it, and is also a perfect emitter of thermal radiation.

Answer: blackbody

b) (10) A law in physics relates the energy radiated away from a blackbody to the temperature of the blackbody, and states that, if M is the energy radiated per unit area per second, and T is the temperature, then M is directly proportional to what power of T ?

Answer: fourth power

c) (10) The law above can be made into an equality instead of a proportionality by multiplying T to the fourth power by this constant, equal to 5.6697 times 10 to the -8 Watts per meter squared Kelvin to the fourth. It is named for the two Austrian physicists who derived the law cited above.

Answer: Stefan-Boltzmann constant

23. FTSNOP, name these people involved in the Chinese Revolution.

a) (5) After the Rebellion gained strength in the south, this doctor returned from his 16-year exile to take command.

Answer: Sun Yat-sen

b) (15) This retired general retained the loyalty of many northern army officers. To achieve the overthrow of the Qing dynasty, Sun offered him the presidency of the new republic in exchange for military support.

Answer: Yuan Shikai

c) (10) After supporting Sun Yat-sen, Yuan Shikai pressured this child emperor to abdicate, which he did on February 12, 1912.

Answer: Henry Pu Yi or Xuantong or K'ang Te

24. (30) During the year 69 AD, four different emperors ruled the Roman empire. Name these four emperors; you will receive 5 points for one correct, 10 for two, 20 for three, and 30 for all four.

Answer: Servius Sulpicius Galba, Marcus Salvius Otho, Aulus Vitellius, Titus Flavius Vespasianus (or Vespasian)

25. FTPE, name these popular methods of data encryption.

a) (10) During each of this system's 16 iterations, a cipher function with a 48-bit key is applied to a 64-bit block of data. Developed during the 1950s, it forms the basis for, among other things, the ATM PIN authentication system, but is now susceptible to brute-force attack.

Answer: DES or Data Encryption Standard

b) (10) In this encryption system, two prime numbers P and Q are selected. Then an arbitrary integer K less

than P times Q and relatively prime to $P-1$ and $Q-1$ is chosen. Numbers are then encrypted by calculating the value of the number raised to the K modulo PQ .

Answer: RSA or Rivest-Shamir-Adleman

c) (10) Developed in the early 1990s to replace DES, this cryptosystem uses a key of 128 bits, making it virtually impossible to break by trying every key. PGP uses both RSA and this cipher for encryption and integrity checking.

Answer: IDEA