

## NEW TRIER VARSITY 2008

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### Round 4: Nicholas II Died When He Fell Into the Czar Chasm

#### Bonuses

1. (DR) It is about a young Irish boy living in Lahore who helps Teshoo Lama and Colonel Creighton.

For 10 points each:

[10] Name this novel completed in 1901.

ANSWER: Kim

[10] This author of *Kim* also wrote the poems "Mandalay", "If", and "Gunga Din".

ANSWER: Rudyard Kipling

[10] This other Kipling novel is about a wealthy boy named Harvey Cheyne, Jr. who becomes a lowly crew member on a ship.

ANSWER: Captains Courageous

2. (JG) Name the following laws governing electron orbitals for 10 points each:

[10] This rule requires that lower energy orbitals be filled first. Its name comes from the German for "constructing".

ANSWER: Aufbau principle (accept reasonable substitutions for 'principle')

[10] Because of this rule, one electron must be in *every* orbital of a particular energy state before any orbital has two electrons.

ANSWER: Hund's rule (accept reasonable substitutions for 'rule')

[10] This rule, as applied to electron orbitals, requires that if an electron has two orbitals, they are of opposite spin.

ANSWER: Pauli exclusion principle

3. (AS/JG) Answer the following about some significant epidemics.

[10] There were six major epidemics of this disease in the 19th century, mostly due to poor sanitation. It is usually spread through fecally contaminated food or water and is characterized by vomiting, dehydration, and diarrhea.

ANSWER: cholera

[10] First observed in U.S. army encampments in Kansas and New York, a more virulent strain of this disease struck 5 months later and spread around the world. It killed 2.5 to 5 percent of the world's population and may have contributed to the German capitulation in World War I.

ANSWER: Spanish influenza (prompt on partial answer)

[10] Signs promoting Hong Kong as a tourist destination with the slogan "It'll take your breath away" were taken down after an 2003 epidemic of this respiratory illness, commonly known by an acronym.

ANSWER: severe acute respiratory syndrome

4. (JG/MS) The major opera in which this character appears abrogates its source in not showing her leave Rodolfo for a viscount, though she eventually dies of consumption in Rodolfo's garret in both versions.

For 10 points each:

[10] Name this operatic heroine whose best-known aria is probably "Donde Lieta" and who forms the titular group of her opera with Marcello, Musetta, and Rodolfo.

ANSWER: **Mimi**

[10] Mimi is the main heroine of this opera depicting poor Parisian students, the most famous aria from which is probably "Che gelida manina".

ANSWER: *La bohème*

[10] This is the Tuscan composer of the major *La bohème*, his version greatly eclipsing a competing one by Leoncavallo. His other works include *Madama Butterfly*, *Tosca*, and *Turandot*.

ANSWER: Giacomo Antonio Domenico Michele Secondo Maria **Puccini**

5. (JG) This lead-in is going to set you up to answer some questions about set theory for 10 points each.

[10] The set with no elements is called this, denoted by a circle with a slash through it.

ANSWER: **nullset** or **empty** set

[10] This is the set of all subsets of a particular set. If a set has  $n$  elements, it has  $2^n$  subsets.

ANSWER: **power set**

[10] This Italian mathematician developed a set of axioms about the natural numbers, which include the definition of a lower bound and succession. He also started the Formulario Project and worked on an international language.

ANSWER: Giuseppe **Peano**

6. (DR) Identify these nicknames given to parts of the United States Constitution:

[10] This nickname is given to the thirteenth, fourteenth, and fifteenth amendments. It reflects the time period in which they were passed.

ANSWER: **Reconstruction** Amendments

[10] This three-word phrase appears twice in article two, section two, clause two, describing what the President should get from the Senate when making treaties and appointments.

ANSWER: **Advice and Consent** Clause

[10] This nickname is given to the first section of the fourth article of the Constitution. It actually is the first four words of the Article, describing the way one state is supposed to handle judicial proceedings of another state.

ANSWER: **Full Faith and Credit** Clause

7. (JG) Name the following Chinese dynasties for 10 points each.

[10] This seventh- and eighth-century CE dynasty saw two censuses taken and the domination of Confucianism, as well as the An Shi rebellion.

ANSWER: **Tang** Dynasty

[10] Also known as the Empire of the Khitan, this initially script-less society had an unusually liberal attitude towards women's rights. It came between the Song and Jin dynasties.

ANSWER: **Liao** Dynasty

[10] This dynasty lasted nearly three hundred years and was known for its vases. Its first emperor, Hongwu, advocated autonomy of rural areas.

ANSWER: **Ming** Dynasty

8. (DT) Identify these Egyptian deities:

[10] Seth trapped this god of the dead in a specially made coffin, and after Isis discovered his body, Seth proceeded to tear it into fourteen pieces. Of course, his son Horus got his revenge, castrating Seth and taking over the throne.

ANSWER: **Osiris** (accept **Usir**)

[10] Re was said to travel through her body each night before being reborn each morning. This sky goddess took the five days preceding the new year and gave birth to five gods.

ANSWER: **Nut** (accept **Nuit**)

[10] This "Friend of the Dead" and daughter of Nut was the consort of Seth and stood at the head of the birth-bed while Isis served as midwife. She later married Anubis.

ANSWER: **Nephthys** [NEHF this]

9. (DR) Name these video games that came out around 1980.

[10] This game featured Blinky, Pinky, Inky, and Clyde.

ANSWER: **Pac-man** (do not accept Ms. Pacman)

[10] In this game, the bottom half of the screen featured a road that needed to be crossed, and the top of the screen featured a river. When crossing the river, you could jump on the alligator's back, but not in its mouth.

ANSWER: **Frogger**

[10] This Namco game was an improvement over Space Invaders and a precursor to Galaga.

ANSWER: **Galaxian**

10. (DR) Identify these terms with mythological origins:

[10] This six letter term was originally the name of Cupid's wife. Cupid is sometimes referred to as Eros, and this woman is sometimes considered his lover rather than his wife.

ANSWER: **Psyche**

[10] This term comes from the name of a wood nymph whose voice was stolen so that she was only capable of repeating what other people said. She was in love with Narcissus.

ANSWER: **Echo**

[10] This was the goddess of history in early Norse myths. This character eventually merged with Frigg, and her name became synonymous with legendary narratives.

ANSWER: **Saga**

11. (TB) Computational — pencil and paper ready. Evaluate the following derivatives with respect to  $x$  at the given points, and answer in integer form, for 10 points each:

1. [10] One-ninth times  $x$  to the ninth plus four  $x$  to the fifth plus three  $x$ , at  $x$  equals two

2. [10] The sine of  $x$  times the cosine of  $x$  at  $x$  equals pi over two.

3. [10] The natural log of the quantity  $x$  to the fourth, close quantity, at  $x$  equals one-half. You have thirty seconds.

ANSWER 1: **579**

ANSWER 2: **-1**

ANSWER 3: **8**

12. (JG) Wien's [WEENZ] displacement law gives the strongest wavelength of their namesake radiation, and their emitted power can be calculated from the Stefan-Boltzmann [STEH-fun BOLTZ-mun] Law. For 10 points each:

[10] Identify these objects, perfect ones of which absorb all incident radiation. They are named for their appearance.

ANSWER: **black body**/ies

[10] This law describes the intensity of the spectrum emitted by black bodies as a function of temperature and frequency. It is named after the man who hypothesized that energy is quantized.

ANSWER: **Planck's** Law

[10] This radiation fits the spectrum of Planck's law for 2.7 kelvins and is explained by the Big Bang theory. It was discovered accidentally by Arno Penzias and Robert Wilson in 1964.

ANSWER: **cosmic microwave background** radiation (prompt on partial answers or on **relic** radiation)

13. (DR) Identify these people who share the same first name:

[10] He wrote "My Last Duchess" and married another successful poet.

ANSWER: Robert **Browning**

[10] He wrote *Scouting for Boys* and generally is regarded as the founder of the scout movement.

ANSWER: Robert **Baden-Powell**

[10] He played a role in the Saturday Night Massacre during the Watergate Scandal and was nominated unsuccessfully for the Supreme Court in 1987.

ANSWER: Robert **Bork**

14. (DR) Name these early American writers:

[10] Her brother-in-law published her poems in 1650 in England under the title *The Tenth Muse Lately Sprung Up in America*.

ANSWER: Anne **Bradstreet** or Anne **Dudley**

[10] Many of his poems, including "I Am the Living Bread", deal with Communion. Other works include "Huswifery" and "Upon a Spider Catching a Fly". He moved to the United States in 1668 and attended Harvard.

ANSWER: Edward **Taylor**

[10] This writer of "On Being Brought from Africa to America" also composed a poem praising the repeal of the Stamp Act, and was freed from slavery when her poetry became popular.

ANSWER: Phillis **Wheatley**

15. (SS) Computational — pencil and paper ready. Given the line with equations:  $x = \text{four plus two } t$ ,  $y = \text{negative two plus } t$ , and  $z = \text{two minus } t$ ,

1. [10] Find the line's direction vector.

2. [10] Find the intersection of that line with the line given parametrically by  $x = \text{seven minus } t$ ,  $y = \text{negative four plus three } t$ , and  $z = \text{negative one plus two } t$ .

3. [10] Find in standard form the equation of the plane perpendicular to the original line at the point zero comma negative four comma four. You have thirty seconds.

ANSWER 1:  $\langle \underline{2}, \underline{1}, \underline{-1} \rangle$  or  $\langle \underline{2i} + \underline{1j} - \underline{1k} \rangle$  or  $\langle \underline{2i} + \underline{1j} + \underline{-1k} \rangle$  or any scalar multiple thereof (that is, accept an answer in which everything is multiplied by or divided by any constant number other than zero)

ANSWER 2:  $(x,y,z) = (\underline{6}, \underline{-1}, \underline{1})$  or  $x = \underline{6}, y = \underline{-1}, z = \underline{1}$

ANSWER 3:  $\underline{2x} + \underline{1y} - \underline{1z} + \underline{8} = \underline{0}$  or  $\underline{2x} + \underline{1y} - \underline{1z} = \underline{-8}$  or equivalent

16. (JG) When he wasn't busy cutting up kids and having relations with his 700 wives and 300 concubines, King Solomon wrote some stuff. Name these books of the bible attributed to him for 10 points each.

[10] Otherwise known as Canticles, this one of the five scrolls is read during Passover. It ostensibly celebrates mad hot sex, but is sometimes read as a criticism of Solomon's polygamy under the assumption it was actually written by someone else.

ANSWER: **Song of Songs** or **Song of Solomon** or **Shir Shirim** or **Shir Shlomo**

[10] Solomon is said to have written this book of wisdom in his middle age. Its first division is presented as a father counseling his son, and many of the aphorisms in this book seem to have been borrowed from the Egyptian work "The Instructions of Amenemopet" [ah meh NEHM oh peht].

ANSWER: **Proverbs** of King Solomon or **Mashley** Shlomo

[10] This pessimistic work was supposedly written by Solomon when he was a bitter old man. However, it is very likely that he didn't write it, not least because he uses words that didn't exist in his time. It emphasizes the futility of life and concludes, "For God shall bring every work into judgment, with every secret thing, whether it be good, or whether it be evil."

ANSWER: **Ecclesiastes** or **Kohelet**

17. (JG) From their functions, give the names of these parts of the human brain. You should be using at least one of them in the process.

[10] This part of the brain, part of the base of the stem, maintains basal functions like breathing and heart rate.

ANSWER: **medulla oblongata** (prompt on partial answer)

[10] Located within the medial temporal lobe, this region is largely responsible for forming short-term memories. It also plays a role in spatial reasoning.

ANSWER: **hippocampus**

[10] Named for its almond-like shape, it is argued that this region is merely a cluster of several essentially unrelated units. One major function of this is to associate memories and emotions, thus giving it a major role in fear-based conditioning.

ANSWER: **amygdala** (accept **amygdaloid** region)

18. (JG) For 10 points each, name these architects of the Bauhaus [BOW howss]:

[10] This man founded the Bauhaus and designed its original building. He also designed the American embassy in Athens.

ANSWER: Walter Adolph Georg **Gropius**

[10] This German designed New York's Seagram building, several buildings in Chicago including much of IIT, and also created the Barcelona chair.

ANSWER: Ludwig **Mies van der Rohe** (prompt on partial answer)

[10] This was the third director of the Bauhaus. A vehement Marxist, this Swiss man emphasized the economical design of buildings to fit their social contexts.

ANSWER: Hannes **Meyer**

19. (JG) Answer the following about some events of April, 1865:

[10] People who snarkily ask "Apart from that, Mrs. Lincoln, how did you enjoy the play?" are talking about this play by Tom Taylor, during which Abe was shot.

ANSWER: **Our American Cousin**

[10] This actor, who was not in *Our American Cousin* but did sometimes act in shows at Ford's Theatre, shot Lincoln.

ANSWER: John Wilkes **Booth**

[10] Lincoln's assassination was actually part of a larger conspiracy that sought to kidnap or kill various other government officials. Part of that plot was this woman, in whose tavern the conspirators met to plan. For her role, she became the first woman executed by the federal government.

ANSWER: Mary Elizabeth Eugenia Jenkins **Surratt**

20. (DR) It states that, given a line and a point not on that line, there is exactly one line passing through the point that does not pass through the line. For 10 points each:

[10] Give the nickname commonly applied to this statement, equivalent to Euclid's fifth postulate.

ANSWER: **parallel** postulate or **Playfair's** axiom

[10] Rejecting the parallel postulate gives non-Euclidean geometries such as this type, sometimes called Riemannian, in which there are no lines through the point which do not cross the line.

ANSWER: **elliptical** geometry

[10] In this type of geometry, the distance formula between two points  $x_1$  comma  $y_1$  and  $x_2$  comma  $y_2$  is given by the absolute value of  $x_1$  minus  $x_2$  plus the absolute value of  $y_1$  minus  $y_2$ . The name comes from an analogy to navigating city blocks.

ANSWER: **taxicab** geometry or **Manhattan** geometry (accept "metric" for "geometry")