Universidad Nacional de La Plata
Facultad de Ciencias Astronómicas y Geofísicas
Examen de inglés para la carrera de geofísica plan 2006

NAME:..... DATE:.....

Section A

a. Read the following article and answer (in English)

The New Knowledge Leads to Greater Understanding...

Since the San francisco Earthquake in 1906, a vigorous earthquake research program has developed in the U.S. Today, seismographs measure the shaking intensity at over 1000 sites in California. Geodetic instruments and repeated surveys track the plate motion and the related stressing and distortion of the Earth's crust (which causes earthquakes) throughout California. Data from these instrument networks are analyzed with the aid of computers. From these observations, scientists have formed a detailed picture of the location and activity of the hundreds of faults that make up the San Andreas fault system. They have achieved a growing understanding of which faults are likely to produce strong earthquakes, what their long-term probabilities for occurrence are, and how intense the shaking from them is likely to be. From this understanding, maps have been created that anticipate where shaking is likely to be strong, and these maps guide regional zoning and land use decisions affecting the location of schools, hospitals, homes and nuclear power plants. Also from this understanding, engineers have developed building codes designed to produce buildings and bridges that can withstand the shaking. Earthquake research also guides insurance companies in their formulation of earthquake insurance policies that help businesses and individuals deal affordably with earthquake risk.

1. How has the San Francisco Earthquake influenced research in the US?
2. How have scientists mapped the location and activity of the San Andreas fault?
3. Why are these maps important?

Section B

a. Read the following information about earthquakes and put the verbs in brackets in the correct form.

An earthquake …….. (also-know) as a tremor. There is a long list of earthquakes that …….. (cause) many fatalities since 1900. In 2007 …….. (there be) an earthquake in northern Chile which …….. (result) from the release of stresses in the Peru-Chile subduction zone. While scientists …….. (analyze) the information

from the latest earthquake, they suddenly …….... (feel) a tremor, which was later confirmed as Magnitude 7.7.

In the next international Geophysics Meeting, scientists …….... (compare) the earthquake data from different teams.

b. Read the following conversations and fill in the blanks with a suitable word or phrase.

Peter has to meet George. He is asking for directions.

P: Excuse me, …….. to *Jay's Pub*?

M: Go along this street and _____ left at the traffic lights. Go past the station and the pub is _____ the Museum of Modern Art.

P: Thank you.

Peter meets George at the pub.

P: Hey, George.

G: Hi, Peter. …….. to drink?

P: a Coke.

G (to the waiter): Two Cokes, please.

P: I phoned you last night but you …….. (not answer). Where were you?

G: I was at home. When the phone rang, I …….. (have) a shower. When I got there, it stopped ringing. So, what do you think of a day trip to SF?

P: Great! I …….. (never be) to SF.

G: It's an amazing city. People dress very _____ and talk _____ there. We can visit the Golden Gate Bridge. It's one of the _____ bridges in the States.

P: The brochure says there was a terrible earthquake in SF.

G: Yes, that was _____ 1906, a century _____. Next week they ……. (show) some documentaries about the earthquake at the Geophysics Association. We can go.

P: Sure. I'll phone Marie. She's the girl _____ lives next door. She's studying geophysics.

c. Peter, George and Marie attend a lecture on earthquakes. Listen and choose the right answer to the following questions.

1. What does the speaker say about his experience in Kobe?

- ○ It was impossible to predict the earthquake at that time.
- ○ The shaking he experienced changed his life.
- ○ He was not near enough to feel the shaking so hard.

2. What is said about the 1906 San Francisco earthquake?

- ○ Its impact was not as strong as a similar event would have at present.
- ○ It was more devastating than that of Kobe.
- ○ It should serve as a model for earthquake prediction.

D. Imagine you are George. Write an email to your family, telling them about:

- ➢ your friends
- ➢ the place where you live
- ➢ your visit to SF
- ➢ your plans for tomorrow.

……

……

……

……

……

……

……

……

……

……

Section C

Read the following passage and make a synthesis in Spanish.

Most scholars trace the beginning of modern seismology in the United States to the Great San Francisco Earthquake of 1906. When it struck, scientists throughout California —including geologist John Casper Branner— began making observations and collecting data along the San Andreas Fault. Recently, Stanford geophysics Professors Gregory Beroza and Paul Segall, with graduate student Seok Goo Song, conducted a major re-analysis of the infamous temblor. In the following paragraphs Beroza explains how scientists studying the San Andreas Fault continue to learn lessons from the Great Earthquake of 1906.

The 1906 earthquake is thought of as a watershed event in the history of earthquake science. *It* was the event that really clinched the connection between earthquakes and faulting. Before *that*, it was thought that earthquakes and faulting were related, but the one-to-one correspondence between the two was not understood. It led, as well, to the elastic rebound theory, *which* details how energy is accumulated in the Earth's crust as elastic potential energy for hundreds of years and then suddenly released as kinetic energy in the forms of seismic waves and faulting.

What we found in studying the old data from the 1906 earthquake is that we resolved a long discrepancy in the size of the earthquake between magnitude 7.7 and 7.9. Our study suggests that it was M7.9. The previous two models [published in 1993 and 1997] disagreed with each other, not just in the size but also the length of the earthquake. We were able to show that *both data sets* were consistent with the earthquake rupturing a full 300 miles—from San Juan Bautista in the south up to the very northern end of the San Andreas Fault in Cape Mendocino—and that the faulting was massive over the entire distance of the quake.

A 7.9 earthquake would have been 50 percent *bigger*, so instead of being a 200-mile-long rupture, it was 300 miles long, that's a significant difference. The 7.7 scenario had less slip on the fault, and hence the waves from it would have been a lot smaller. Also, the northernmost 100 miles of the fault did not slip in the M7.7 scenario.

Despite our study, there's uncertainty in exactly what happened in 1906. The strength of shaking is close to these big earthquakes is also uncertain, because we have very little data on scale of how the ground moves in these big events. And there are uncertainties in how buildings respond. Given *those uncertainties*, what seems to be a consensus is that a repeat of that earthquake would kill more than 1,000 people in the Bay Area. It would cause at least $100 billion in direct losses, so it would be a catastrophe. Of course, things would be worse if we had not done all this earthquake resistant design.

It's thought that at least 3,000 people died in San Francisco itself in the 1906 earthquake. San Francisco is bigger than it was in 1906, and of course the whole urban conglomeration of the Bay Area is gigantic. Many, many times more people will be exposed to this strong shaking. To some extent it's inevitable when you shake a big urban area that strongly that bad things will happen. We just want to minimize *them*, if possible.

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

b) Answer these questions about the text.

1. What do the following refer to in the text?

It (l.10)
That (l.11)

Which (l.13)

both data sets (l.21)

Those uncertainties (l.34)

Them (l.44)

2. What two things does bigger (l.26) compare?

3. What word/s are used instead of *earthquake*?

4. What kind of relation do these conjunctions express? (addition, opposition/contrast, cause/consequence, time)

As well (l.14)

So (l.26)

Also (29)

Despite (l.31)

Key

Section A.

1. The US has developed a strong research program.
2. They have detected plate motion with geodetic instruments and surveys, and analyzed these data with computers.
3. Because the show where shaking will be strong. They help find the best location for schools, hospitals, etc. They also help insurance companies and engineers.

Section B.

A.

is known
have caused
there was
resulted
were analyzing
felt
will/are going to compare

B.

1. how can I get
2. turn
3. opposite
4. What would you like
5. didn't answer
6. was having
7. have never been
8. well
9. loudly
10. largest
11. in
12. ago
13. will show
14. who

C.

1. The shaking he experienced changed his life.
2. Its impact was not as strong as a similar event would have at present.

Section C.

B1.

1. It (l.10) : the 1906 earthquake
2. That (l.11): the 1906 earthquake
3. Which (l.13): the elastic rebound theory
4. both data sets (l.21): two models [published in 1993 and 1997]
5. Those uncertainties (l.34): what happened in 1906 and how buildings respond.
6. Them (l.44): bad things

B2. A 7.9 earthquake and a 7.7 one

B3. Earthquake, shaking

B4

As well (l.14) = addition

So (l.26) = consequence

Also (29) = addition

Despite (l.31) = contrast