

Listening

2 sets, 5 audios and 28 questions, 36 minutes

Set 1

Conversation 1	5 questions	Time for questions: 10 minutes
Lecture 1	6 questions	
Lecture 2	6 questions	

Set 2

Conversation 2	5 questions	Time for questions: 6.5 minutes
Lecture 3	6 questions	

- You will not see the questions before and while the audio plays
- You will not be able to listen again to the full recording to check your answer choices
- You must choose an answer to proceed to the next question and you cannot change your answers after they are submitted.
- Some questions deal with particular parts of the audio recordings, and the test will replay a small audio clip for you. The answer choices appear only after the audio recording has finished.
- After a set of five or six questions is finished, the next recording will start automatically.

TPO 22 C1 Questions

1. Why does the student go to the man's office?

- (A) To get some advice on an article that she is writing
- (B) To find out about getting a job on the student newspaper
- (C) To protest the university's decision about a statue
- (D) To complain about an article in the student newspaper

2. What points does the man make about the article they are discussing?

Click on 2 answers.

- (A) It was the personal viewpoint of the writer.
- (B) It was based on research by one of the editors.
- (C) It was meant to be humorous.
- (D) Not many people have read it.

3. What is the student's opinion of the editorial's representation of Sally Smith?

- (A) She agrees it was accurate.
- (B) She believes it was not respectful.
- (C) She believes that the editor was referring to someone else.
- (D) She agrees that the editorial's focus on Sally's background is relevant.

4. What does the man imply about the university's student government organization?

- (A) Its reputation has been damaged by recent events.
- (B) Its leaders need to be more careful about what they say in public about the university.
- (C) It will probably benefit from what the newspaper printed about it.
- (D) Its communications with the public have recently become more effective.

5. What does the woman imply when she says this:

TPO 22 C1 Script

S Hi, I'm sorry to bother you, but...

FA Yes?

S This is about the newspaper.

FA Oh, Ok. Well. I'm only the adviser. The newspaper office is off campus on Pine Street. Uh... what was it? Did you want to work for the paper? We're always looking for writers.

S Well, my problem was with the writing actually, with an article that was published in yesterday's newspaper.

FA Oh? Which one?

S The one about the student government and its president Sally Smith.

FA Is this something to do with what the editor wrote about the statue? Uh, the statue at the main entrance of the university?

S Well, that's part of it. But you know, the editor used the situation to say some really unfair things, about the student government, and the president Sally Smith in particular. I think the paper should publish a retraction, or at the very least an apology to Sally.

FA Ok. Umm... if I remember correctly, what you're referring to wasn't a news story, but an editorial, right? Uh, it was on the opinion page, it was signed by one of the editors, and was clearly labeled as commentary.

S Well, yes. But the thing about the statue, Sally made this simple comment that was in really bad condition and should be replaced. And, well, the tone in the editorial was demeaning. It accused her of not respecting the past. And it had some personal stuff that seemed unnecessary.

FA Wait a minute. Remind me.

TPO 22 C1 Script

S Well, you know, it implied that Sally doesn't know much about the university's history. And it called her a big city politician because she's from Boston. It's just mean-spirited, isn't it?

FA Haven't you heard the saying "all publicity is good publicity"?

S Well...

FA I'd say the article's bringing attention to the student government organization, which is pretty invisible. Uh, you rarely hear about what the student government's doing.

S But this article...

FA And the piece... Well, yeah, it had a bit of an exaggerated tone. It was satirical, or at least it was meant to be. It wasn't only poking fun at Sally, but the whole idea that our school is sort of rural, and you know, not cosmopolitan.

S Well, none of us thought it was very funny.

FA Well, sometimes it's best just to roll with it. It's just a cliché. Everybody knows it's not true.

S But I thought we could expect better than that here.

FA Well, I'm certainly in favor of getting a variety of viewpoints. So why don't you go talk to the editor, Jennifer Hamilton, and tell her you want equal time? You or Sally could write a response.

S Really? She'd let us do that? Didn't she write it?

FA I'll let Jennifer know you are coming, she feels the same way I do. She's a journalism major. She'd be happy to publish another point of view.

TPO 22 L1 Questions

1. What does the professor mainly discuss?

- (A) Sudden population increases in early states
- (B) Possible reasons for the formation of early states
- (C) Consequences of agricultural land shortages in ancient Egypt
- (D) Common political problems of chiefdoms

2. According to the professor, what are two typical characteristics of a band?

Click on 2 answers.

- (A) It is the smallest type of group.
- (B) It is the most socio-politically complex type of group
- (C) It practices intensified agriculture
- (D) It is able to meet its own basic needs.

3. What does the professor say is a characteristic feature of states?

- (A) States often damage the environment of the area they occupy.
- (B) States engage in trade to obtain necessary goods for their population.
- (C) States often undergo sudden changes in population.
- (D) States manage food production for the entire population.

4. What reason for prehistoric social problems does the professor mention?

- (A) Competition for resources
- (B) Poor decisions by the ruling classes
- (C) The existence of several conflicting legal codes
- (D) Cultural differences between neighboring states

5. Why does the professor mention upper, middle, and lower classes?

- (A) To explain why formal legal codes were developed
- (B) To explain what factors caused the destruction of several early states
- (C) To stress the importance of agricultural workers
- (D) To further describe the organization of states

6. What is the professor's opinion about the environmental approach?

- (A) It will remain popular for a long time.
- (B) It does not help explain how early states formed.
- (C) Some evidence supports it, but other evidence contradicts it.
- (D) It should be applied when analyzing hierarchies.

P One of the big questions when we look at prehistory is, why did the earliest states form? Well, to begin we'd better define exactly what we mean when we talk about states. Uh, the human groups that are the smallest, and have the least social and political complexity, we call bands. The groups that are the largest and most socially and politically complex, we call states. So, the level of complexity here refers to the organization of people into large, diverse groups, and densely populated communities. And there are four levels in total: bands, tribes, chiefdoms and states. But, but back to my original question. Why did early states form? Why not just continue to live in small groups? Why become more complex?

One theory called the **environmental** approach hypothesizes that the main force behind state formation was population growth. It assumes that centralized management was critical to dealing with issues caused by sudden population surges, like a strain on limited food supplies.

At the least complex end of the spectrum, the few families living in bands are able to meet their own basic needs. They usually hunt together and forage whatever foods are available to them, instead of domesticating animals and planting crops. In order to efficiently take advantage of the wild foods available, bands are often nomadic and move around following herds of animals. This strategy is feasible when you have a small population.

TPO 22 L1 Script

But when you have a large population, well, the whole population can't just get up and move, to follow a wild herd of animals. So you need sophisticated technologies to produce enough food for everyone. And there is an increased need to resolve social problems that arise as people begin to compete for resources. To manage intensified food production, to collect, store and distribute food, you need centralized decision-making, centralized decision-makers.

It's the same thing when it comes to maintaining social order. You need to create and efficiently enforce a formal legal code. It makes sense to have a centralized authority in charge of that, right? So a hierarchy forms. By definition, states had at least three social levels. Usually, an upper class of rulers, a middle class comprised of managers and merchants, and a lower class of craft producers and agricultural laborers.

The environmental approach hypothesizes that states appear in certain environmental settings, settings which have a severe population problem or a shortage of agricultural land. But not everyone agrees with the theory. It definitely has some weaknesses. For example, states have developed in places like the mild lowlands of Mesoamerica and in Egypt's Nile River Valley. Both places had vast areas of fertile farmland, no shortage of agricultural land. And what about population increase? Well, there were some early states that formed where there wasn't any sudden population increase. So it seems that these are valid criticisms of the environmental approach.

TPO 22 L2 Questions

1. What is the main propose of the lecture?

- (A) To compare solutions to the greenhouse-gas problem
- (B) To examine methods used to study star formation in other solar systems
- (C) To discuss evidence for liquid water on young Earth and Mars
- (D) To discuss attempts to solve a puzzle related to the Sun

2. Why is geological evidence of liquid water on Earth and Mars three to four billion years ago problematic?

- (A) It suggests that the solar system is younger than it could possibly be.
- (B) It suggests that the young Sun was less bright than it is today.
- (C) It challenges the prevailing model of star formation.
- (D) It contradicts theories about the beginning of the universe

3. Why did the greenhouse-gas solution fail to explain the early presence of liquid water on Earth and Mars?

Click on 2 answers.

- (A) The types of gases that were present in their atmospheres could not have caused temperatures to rise.
- (B) There was insufficient carbon dioxide in their atmospheres to produce a greenhouse effect.
- (C) Solar radiation would have destroyed the ammonia in their atmospheres.
- (D) Clouds of ammonia would have lowered temperatures by blocking out sunlight.

4. Why does the professor mention the solar wind?

- (A) To explain a way the Sun is losing mass
- (B) To point out that it was less intense billions of years ago
- (C) To suggest a reason for early climate differences between Earth and Mars
- (D) To explain the importance of solving the faint-young-Sun paradox

5. What factor did astronomers consider when calculating the required solar mass for liquid water to exist on Earth and Mars?

- (A) The young Sun lost mass at a slower rate than it currently does.
- (B) The young Sun was closer to the planets than it currently is.
- (C) The young Sun had less solar wind activity than it currently does.
- (D) The young Sun comprised greater amounts of helium than it currently does.

6. What is the professor's attitude about the bright-young-Sun solution?

- (A) He is surprised that it is not more widely accepted.
- (B) He feels that it raises too many unanswerable questions.
- (C) He is confident that future research will determine whether it is true.
- (D) He expects that other possible solutions to the paradox will be proposed.

P Today, I want to talk about a paradox that ties in with the topic we discussed last time. We were discussing the geological evidence of water, liquid water on Earth and Mars three to four billion years ago. So, what evidence of a liquid water environment did we find in rock samples taken from the oldest rocks on Earth?

SA Uh... Like pebbles, fossilized algae?

P Right. And on Mars?

SB Dry channels?

P Good. All evidence of water in liquid form, large quantities of it. Now, remember when we talked about star formation, we said that as a star ages, it becomes brighter, right? Hydrogen turns into Helium, which releases energy. So our standard model of star formation suggests that the Sun wasn't nearly as bright three to four billion years ago as it is today, which means that temperatures on Earth and Mars would have been lower, which in turn suggests...

SA There would have been ice on Earth or Mars?

P Correct. If the young Sun was much fainter and cooler than the Sun today, liquid water couldn't have existed on either planet. Now, this apparent contradiction between geologic evidence and the stellar evolution model became known as the faint young Sun paradox.

Now, there've been several attempts to solve this paradox. First, there was the greenhouse-gas solution. Well, you're probably familiar with the greenhouse gas effect, so I won't go into details now. The idea was that trapped greenhouse gases in the atmospheres of Earth and Mars might have caused temperatures to rise enough to compensate for the low heat the young Sun provided. And so it would have been warm enough on these planets for liquid water to exist. So, what gas do you think was the first suspect in causing the greenhouse effect?

SB Umm... carbon dioxide, I guess. Like today?

P In fact, studies indicate that four billion years ago, carbon dioxide levels in the atmosphere were much higher than today's levels. But the studies also indicate that they weren't high enough to do the job - make up for a faint Sun. Well then some astronomers came up with the idea that atmospheric ammonia may have acted as a greenhouse gas. But ammonia would have been destroyed by the ultra-violet light coming from the Sun and it had to be ruled out too.

TPO 22 L2 Script

Another solution, which was proposed much later, was that perhaps the young Sun wasn't faint at all. Perhaps it was bright. So it is called the bright-young-Sun solution, according to which the Sun would have provided enough heat for the water on Earth and Mars to be liquid. But how could the early Sun be brighter and hotter than predicted by the standard model? Well the answer, is mass.

SA You mean the Sun had more mass when it was young?

P Well, if the young Sun was more massive than today's, it would have been hotter and brighter than the model predicts. But this would mean that it had lost mass over the course of four billion years.

SB Is that possible?

P Actually, the Sun is constantly losing mass through the solar wind, a stream of charged particles constantly blowing off the Sun. we know the Sun's current rate of mass loss. But if we assume that this rate has been steady over the last four billion years, the young Sun wouldn't have been massive enough to have warmed Earth, let alone Mars, not enough to have caused liquid water.

SA Maybe the solar wind was stronger then?

P There is evidence that the solar wind was more intense in the past. But we don't know for sure how much mass our Sun's lost over the last four billion years. Astronomers tried to estimate what solar mass could produce the required luminosity to explain liquid water on these planets. They also took into account that with a more massive young Sun, the planets would be closer to the Sun than they are today. And they found that about seven percent more mass would be required.

SB So the young Sun had seven percent more mass than our Sun?

P Well, we don't know. According to observations of young Sun like stars, our Sun may have lost as much as six percent of its initial mass, which doesn't quite make it. On the other hand, this estimate is based on a small sample. And the bright-young-Sun solution is appealing. We simply need more data to determine the mass loss rate of stars. So there's reason to believe that we will get an answer to that piece of the puzzle one day.