계열	공 학

2012학년도 한국항공대학교 수시 1차 심층면접 문제

영 역 1

※ Read the following passage and answer the questions.

Some fuels are derived from the fossilized remains of plants and animals, and they take more than 80 percent of worldwide energy consumption. Despite modern society's heavy dependence on **fossil fuels** for energy, most people are aware that the supply of these fuels is finite. Researchers are looking for alternative energy sources, including solar and nuclear power. Solar panels catch energy directly from the sun and convert it into electricity. Unlike the burning of fossil fuels, the process of converting solar energy into electricity produces no emissions. Today, however, solar power generation system is responsible for roughly one percent of the overall energy consumption, primarily because the cost of the panels is still very high. And price is only one issue. Darkness also causes solar panels (A) _____ collect less energy, which requires one to have additional power sources available. Some scientists think the solution to this problem can be found in "**space**". **With no nighttime at a certain orbit**, a space-based solar power station could operate continuously. These stations would send the power back to the earth, which could then be turned into electricity for consumption. **Advocates** of solar space stations say this technology would require a lot of money initially, but eventually it could provide continuous, clean energy that would be (B) _____ than other fuels.

1. What does "**fossil fuels**" mean?
2. What can be substitutes for fossil fuels?
3. What are the advantages and disadvantages of solar power?
4. Fill in the blank (A) with a suitable word.
5. Translate the phrase "**With no nighttime at a certain orbit**" into Korean.
6. Why does the author of this passage mention "**space**"?
7. What does "**advocates**" mean in the last sentence?
8. Fill in the blank (B) in the last sentence with a suitable word.

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영 역 2

[문제 1] K공장에서는 10개월 동안 10406^{203}개의 사탕을 생산하였다. 사탕을 101개씩 상자에 담아 포장하였다면, 포장되지 않고 남은 사탕의 개수를 이항정리를 이용하여 구하시오. 단, 포장되지 않고 남은 사탕의 개수는 100개 이하이다.

(이항정리 공식은 $(x+y)^n = \sum_{k=0}^{n} {}_n\mathrm{C}_k \, x^k y^{n-k}$ 이다.)

[문제 2] xy 평면 상에 곡선 $y=x^2-2$, 직선 $y=x$, $y=-x$ 가 있다.

1) 주어진 곡선과 직선들의 그래프를 그리고, 그 교점들의 좌표를 구하여 그래프에 표시하시오.

2) 원점으로부터의 거리가 최소가 되는 곡선 $y=x^2-2$ 상의 점의 좌표를 구하시오.

3) 곡선 $y=x^2-2$와 직선 $y=x$, $y=-x$ 로 둘러싸인 평면도형의 $x \geq 0$ 부분을 3차원 공간 상에서 y 축을 중심으로 회전시켰을 때 생기는 공간도형의 부피를 구하시오.