金沢工大　2013年

Ⅲ．

次の英文は「蓄電システム」について述べたものです。( ア )～( コ )に入れる最も適当なものを選択肢から選びなさい。

A major problem that electric power companies have to deal with is the need to be prepared to provide large amounts of power at times of peak usage. If there is enough generating ( ア ) to handle demand at times of maximum power use, such as during the day in the summer, then some of the power company’s equipment will be idle during times of normal or low power use. This is inefficient and uneconomical. To help ( イ ) this problem, many power companies around the world use various methods of storing energy so that it can be provided during times of high demand.

Batteries store electrical power, of course. However, there are no batteries which can store and discharge the very large amounts of energy at the speeds needed by power companies. ( ウ ), the most widely used system of storing energy is “pumped-storage hydropower” or PSH. The basic principle of PSH is to use energy during times of low demand to pump water from a lower position to a higher one. Most ( エ ), this is done where two reservoirs of water at different heights are conveniently located not too far apart. When extra power is needed, the water is released from the higher reservoir through turbines which generate electricity.

Unfortunately, sites appropriate for this type of PSH are not common, and they are very expensive to develop. That is ( オ ) researchers and developers are considering alternative types of PSH which can be installed more easily and cheaply. Several ideas involve pumping water in underground facilities. Such systems can be installed where large amounts of land are not available.

Another type of energy storage relies on compressed air ( カ ) than pumped water. In compressed-air energy storage (CAES), surplus power is used to compress air and store it. The compressed air is released and used to run generators when extra power is needed. Unfortunately, the CAES systems are less ( キ ) than PSH systems because energy is lost as heat during compression. Several developers are currently working on CAES systems that store and reuse the heat caused by compression.

A third category of energy storage transfers heat directly. One company has developed a system which uses argon gas to transfer heat ( ク ) two large tanks filled with gravel. One tank reaches 500℃ and the other cools to -160℃. The stored heat can be used to generate electricity when needed. Other systems use molten (liquid) salts to store heat and release it for ( ケ ) use.

As demand for energy continues to rise, the importance of efficient large-scale energy storage systems is ( コ ) to increase.

( ア ) 1．about 2．capacity 3．electrical

4．industrial 5．staff 6．when

( イ ) 1．cause 2．generator 3．increasing

4．nuclear 5．of 6．overcome

( ウ ) 1．All 2．Especially 3．Eventually

4．Fortunate 5．Instead 6．Possible

( エ ) 1．case 2．commonly 3．countries

4．difficult 5．operate 6．use

( オ ) 1．about 2．engineering 3．help

4．most 5．problem 6．why

( カ ) 1．expands 2．expensive 3．less

4．production 5．rather 6．technology

( キ ) 1．compressed 2．cost 3．efficient

4．inside 5．pump 6．reliability

( ク ) 1．between 2．control 3．increases

4．pipe 5．place 6．whenever

( ケ ) 1．environment 2．later 3．lost

4．relatively 5．they 6．which

( コ ) 1．believe 2．certain 3．late

4．report 5．research 6．used