

## Voucher Questions Answer Key

1. Who were some of the first people to use prostheses?  
**Greeks, Romans and Egyptians**
2. What advances in surgery allowed for better prosthetic fit and more accuracy?  
**Anesthesia**
3. What caused the need for better prostheses?  
**So many amputees from 20<sup>th</sup> century World Wars**
4. What is the purpose of a prosthesis?  
**To restore functionality and capabilities of a lost limb**
5. What are the five design considerations for a prosthesis?  
**Location, strength vs. weight, attachment, available materials and cost**
6. What is the interface/socket of a prosthesis?  
**Where the prosthetic device meets the remaining part of the limb**
7. What are the components/pylon of a prosthesis?  
**The internal working parts of the prosthesis**
8. What is the cover of a prosthesis?  
**A material covering to make it look more lifelike**
9. What are three methods of attachment of a prosthesis to a residual limb?  
**Suction valve, belt and harness, and locking pin**
10. What do we call a prosthesis that replaces an arm below the elbow?  
**Transradial**
11. What do we call a prosthesis that replaces an arm above the elbow?  
**Transhumeral**
12. What do we call a prosthesis that replaces a leg below the knee?  
**Transtibial**
13. What do we call a prosthesis that replaces a leg above the knee?  
**Transfemoral**

14. What do carbon fiber and advanced plastics do for prostheses?

These materials make prostheses stronger, lighter and more realistic

15. What are the three types/categories of modern prostheses?

Specialty, functional and cosmetic

16. Why might people not survive the amputation process before the 1840s?

Shock, infection, blood loss, etc.

17. What are the important properties of carbon fiber that enable it to be a successful prosthetic material?

Carbon fiber is light enough for a person to move it quickly and easily, yet strong enough to hold more than the person's body weight. It also gives the person a slight bounce, just like feet do.

18. What is the purpose of a cosmetic prosthesis?

A normal, lifelike appearance so people would not know you had a prosthesis unless told.

19. How does an external cable/switch control system work?

Different body motions cause a cable to move, resulting in an artificial hand moving as desired.  
Example body motions: a shrug and extension of the arm.

20. If an electronic system is utilized for a prosthesis, what is attached to the residual limb to monitor muscle movements?

Electrodes

21. If electrodes are implanted into the brain, what signals do they monitor to determine how a limb should move?

Neuron signals

22. What is the purpose of implanting electrodes into the brain?

Could result in prostheses that enable people to have fully functional moving limbs again

23. What subjects are useful for biomedical and mechanical engineers when designing prostheses?

Anatomy, neurology, biomechanics and sensor motor control

24. In what year was anesthesia used for the first time during surgery?

1842 (March 30)