

How Does Technology Improve Our Lives?

1 Bioengineers design prosthetic devices that help people meet a need. Which of these is an example of a prosthetic device?

- (A) a hearing aid
- (B) a pain patch
- (C) a plaster cast
- (D) an arm sling

2 A bioengineer is designing a prototype for a shoulder prosthetic device. Which design feature is **most** important in order for a patient to have a full range of motion?

- (F) a device that allows the muscles to raise the forearm
- (G) a lightweight ball to fit smoothly into the shoulder socket
- (H) a material that matches the color and density of the actual bone
- (I) a material that is sturdy, lightweight, and comfortable for the patient

3 Which of these technologies has been engineered to meet a human health need?

- (A) a pacemaker
- (B) earbud headphones
- (C) a more comfortable car seat
- (D) a faster elevator

4 A bioengineer is developing a prototype for an improved mechanical heart valve from an older model. Which is the **best** possible purpose of the prototype?

- (F) to see how the heart valve actually works
- (G) to determine how the valve can be made and produced
- (H) to see how well the improved heart valve meets the design criteria
- (I) to see if they can build the improved valve with less expensive materials

5 The table below shows results from the testing of several models of a prosthetic arm. Each model was bent until the joint failed.

Arm Prosthesis Model	Number of Times Elbow Bends (in thousands)
Model A	1,567
Model B	729
Model C	1,976
Model D	947

Which two models **best** meet the criteria for building a durable and long-lasting prosthetic arm?

- (A) Models A and B
- (B) Models A and C
- (C) Models B and C
- (D) Models C and D