

Mechanical Engineering in Human Health

Mechanical Engineering · Answer Key · 18 Questions

1. What is the primary mechanical function of a prosthetic knee joint?

- A) Blood filtration
- B) Simulating gait rotation**
- C) Oxygenating cells
- D) Electrical impulse generation

2. Which European country is home to the company Ottobock, a global leader in prosthetic limb engineering?

- A) Germany**
- B) Spain
- C) Greece
- D) Portugal

3. In orthopedics, what type of mechanical force does a bone plate resist to aid fracture healing?

- A) Photosynthesis
- B) Surface tension
- C) Bending and shear**
- D) Cellular respiration

4. What is the core function of a mechanical heart valve replacement?

- A) Filtering blood toxins
- B) Regulating unidirectional blood flow**
- C) Producing new red cells
- D) Cooling the heart muscle

5. Which mechanical property is essential for a material used in surgical implants to avoid rejection?

- A) High conductivity
- B) Biocompatibility**
- C) Extreme magnetism
- D) Rapid combustibility

6. What mechanical tool is commonly used in laparoscopic surgery in European hospitals?

- A) Hydraulic press
- B) Articulating forceps**
- C) Steam engine
- D) Internal combustion motor

7. What mechanical principle allows a cochlear implant to improve hearing?

- A) Sound amplification through air
- B) Converting sound into electrical signals**
- C) Magnetic repulsion
- D) Vibration of the eardrum

8. What is the function of a mechanical ventilator used in intensive care units?

- A) To digest food
- B) To replace lung function through air pressure**
- C) To cool the body temperature
- D) To pump insulin

9. In mechanical engineering terms, what is an exoskeleton designed to do?

- A) Filter blood
- B) Support and augment human movement**
- C) Increase skin elasticity
- D) Store body fat

10. What mechanical device is used to stabilize a fractured femur during healing?

- A) Intramedullary nail**
- B) Microscope
- C) Centrifuge
- D) Thermometer

11. Which mechanical motion is typical of a standard prosthetic hand gripper?

- A) Constant vibration
- B) Pinch or grasp**
- C) Thermal expansion
- D) Solar rotation

12. What is the primary material component often used in dental implants for its mechanical strength?

- A) Titanium**
- B) Rubber
- C) Cotton
- D) Wax

13. What does a dialysis machine mechanically remove from the blood?

- A) Oxygen
- B) Waste products and excess fluid**
- C) Proteins
- D) Vitamin D

14. What mechanical part allows a wheelchair to move across surfaces?

A) A transmission gearbox

B) A wheel-axle system

C) A steam turbine

D) A photovoltaic cell

15. Which mechanical engineering term describes the resistance of a limb to movement?

A) Viscosity

B) Torque

C) Photosynthesis

D) Osmosis

16. What mechanical device measures the force exerted by a patient during physical therapy?

A) Dynamometer

B) Barometer

C) Telescope

D) Hydrometer

17. What is the mechanical purpose of a medical tourniquet?

A) To measure heart rate

B) To restrict blood flow

C) To monitor brain waves

D) To filter pathogens

18. What mechanical energy is generated by a pacemaker to stimulate the heart?

A) Kinetic

B) Electrical

C) Thermal

D) Nuclear