

## Biomedical Engineering Focus Areas Review

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Directions:** Match the focus area on the left side with its definition on the right side.

1. \_\_\_\_ Biomaterials & Tissue Engineering
2. \_\_\_\_ Biomechanics
3. \_\_\_\_ Biomedical Devices
4. \_\_\_\_ Bioimaging & Signal Processing
5. \_\_\_\_ Cellular & Molecular Biotechnology
6. \_\_\_\_ Neuroengineering

A. The field of study focused on the practical application of cellular and molecular knowledge with the aim of enhancing or improving production in microorganisms or cell cultures

B. The scientific study of the mechanics of living structures (or of structured produced by organisms)

C. The field of study in which man-made materials are developed for medical treatments and living functional tissue is produced

D. The field of study centered on methods and instruments used to acquire, process, and visualize structure of functional images of living objects or systems at desired spatial and temporal scales

E. The field of study that involves the use of engineering technology to study the function of various neural systems

F. The field of study that produces instruments, machines, implants, in vitro reagents, software, materials, and other related articles for the safe and effective prevention, diagnosis, treatment, and rehabilitation of illness or disease for human beings

**Directions:** Match the focus area on the left side with example applications of the area on the right side.

1. \_\_\_\_ Biomaterials & Tissue Engineering
2. \_\_\_\_ Biomechanics
3. \_\_\_\_ Biomedical Devices
4. \_\_\_\_ Bioimaging & Signal Processing
5. \_\_\_\_ Cellular & Molecular Biotechnology
6. \_\_\_\_ Neuroengineering

- A. Sensors, monitors, smart watches, prosthetic limbs
- B. PET, MRI, CT, electrocardiograms, heart and neural functions
- C. cochlear implants, vestibular implants, retinal implants, brain-computer interfaces
- D. vaccines, bioreactors, microfluidics, vaccines, pharmaceuticals
- E. bioscaffolds, artificial organs, wound healing, implant failure and material reactions
- F. fluid mechanics and dynamics for the heart, cell mechanics, properties of biological solids and fluids