

Basic Biomechanics, 8e (Hall)

Chapter 1 What Is Biomechanics?

1) Which of the following is the most appropriate definition of biomechanics?

- A) the study of human movement
- B) the study of biological organisms
- C) the study of movement mechanics
- D) the study of the mechanical aspects of biological organisms

Answer: D

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2) Which of the following terms is applied to the study of systems in a constant state of motion?

- A) statics
- B) dynamics
- C) anthropometrics
- D) plyometrics

Answer: A

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3) What term is given to considerations such as the size, shape, and weight of body segments?

- A) cybernetic
- B) anthropometric
- C) kinematic
- D) kinetic

Answer: B

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4) Which of the following is an example of a static situation?

- A) a cyclist riding at a constant velocity
- B) a person balancing motionless on one foot
- C) both a cyclist riding at a constant velocity and a person balancing motionless on one foot
- D) neither a cyclist riding at a constant velocity nor a person balancing motionless on one foot

Answer: C

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5) Which of the following are anthropometric factors?

- A) the length of a forearm
- B) the shape of a body
- C) the weight of the trunk
- D) all of these answers are correct

Answer: D

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6) Which of the following is included in sports medicine?

- A) clinical aspects of exercise and sport
- B) scientific aspects of exercise and sport
- C) both clinical aspects of exercise and sport and scientific aspects of exercise and sport
- D) neither clinical aspects of exercise and sport nor scientific aspects of exercise and sport

Answer: C

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7) Biomechanics has roots in which of the following disciplines?

- A) physics
- B) biology
- C) both physics and biology
- D) neither physics nor biology

Answer: C

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8) Which of the following questions about the long jump should be answered quantitatively?

- A) What is the horizontal velocity at take-off?
- B) What is the angle at take-off?
- C) Both what is the horizontal velocity at take-off? and what is the angle at take-off?
- D) Neither what is the horizontal velocity at take-off? nor what is the angle at take-off?

Answer: C

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9) Which of the following characterizes a formal problem?

- A) a goal or answer
- B) a set of given information
- C) a set of operations that can be used to arrive at the desired answer from the given information
- D) all of these answers are correct

Answer: D

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10) What does the word qualitative mean?

- A) general
- B) numerical
- C) pertaining to quality
- D) all of these answers are correct

Answer: C

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11) Which of the following statements is true regarding qualitative analysis?

- A) It is always of a general nature.
- B) It does not involve the use of numbers.
- C) Both it is always of a general nature and it does not involve the use of numbers.
- D) Neither it is always of a general nature nor it does not involve the use of numbers.

Answer: B

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12) Which of the following professionals regularly make use of qualitative observations?

- A) teachers
- B) coaches
- C) clinicians
- D) all of these answers are correct

Answer: D

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13) Which of the following are components of a structured approach to problem solving?

- A) writing down the given information
- B) drawing a diagram representing the problem situation
- C) rereading the problem to look for additional information that may be inferred from the problem statement
- D) all of these answers are correct

Answer: D

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14) Which of the following countries uses the metric system?

- A) France
- B) Germany
- C) Japan
- D) All of these answers are correct

Answer: D

Accessibility: Keyboard Navigation

15) Which of the following conversions is accurate?

- A) $2.54\text{ cm} = 1\text{ in}$
- B) $2.54\text{ in} = 1\text{ cm}$
- C) $4.45\text{ lb} = 1\text{ N}$
- D) None of these answers is correct

Answer: A

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16) Which of the following is an example of equipment designed to enhance performance?

- A) Klapskate
- B) Aerodynamic helmet
- C) Both klapskate and aerodynamic helmet
- D) None of these answers is correct

Answer: C

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17) Biomechanical research has contributed to which of the following?

- A) injury prevention
- B) enhanced sport performance
- C) equipment design
- D) all of these answers are correct

Answer: D

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18) Which of the following could be performed by a biomechanist?

- A) quantitative analysis of human movement
- B) qualitative analysis of human movement
- C) both quantitative analysis of human movement and qualitative analysis of human movement
- D) none of these answers is correct

Answer: C

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19) Which type of analysis involves identifying, analyzing and answering a question of interest?

- A) quantitative
- B) qualitative
- C) both quantitative and qualitative
- D) none of these answers is correct

Answer: C

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20) Choose the term or phrase that is not synonymous with the others.

- A) Metric system
- B) English system
- C) International system of units
- D) S. I.

Answer: B

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21) What is the base unit for mass in the metric system?

- A) newton
- B) kilogram
- C) meter
- D) slug

Answer: B

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22) Which of the following is true regarding mechanics?

- A) branch of physics
- B) analyzes the actions of forces on particles
- C) both branch of physics and analyzes the actions of forces on particles
- D) none of these answers is correct

Answer: C

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23) Which of the following defines inference?

- A) the process of elimination
- B) the process of forming deductions from available information
- C) the process of observation in a qualitative analysis
- D) none of these answers is correct

Answer: B

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24) Astronauts who travel out of the earth's gravitational field have experienced which of the following?

- A) increased bone density
- B) reduced strength
- C) both increased bone density and reduced strength
- D) none of these answers is correct

Answer: B

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25) Which of the following affects the flight of a discus?

- A) speed at release
- B) projection angle
- C) orientation angle relative to the wind
- D) all of these answers are correct

Answer: D

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26) The high incidence of knee injuries among snow skiers is partially due to which of the following?

- A) rigid boot which limit ankle motion
- B) bindings which release during a fall
- C) both rigid boot which limit ankle motion and bindings which release during a fall
- D) none of these answers is correct

Answer: A

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27) Choose the term that describes the application of mechanical principles in the study of living organisms.

- A) biomechanics
- B) dynamics
- C) English system
- D) kinematics

Answer: A

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28) Choose the term that describes the branch of mechanics dealing with systems in a constant state of motion.

- A) quantitative
- B) sports medicine
- C) statics
- D) tennis elbow

Answer: C

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29) Choose the term that describes the branch of mechanics dealing with systems subject to acceleration.

- A) biomechanics
- B) dynamics
- C) English system
- D) kinematics

Answer: B

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30) Choose the term that describes the study of the description of motion, including considerations of space and time.

- A) dynamics
- B) English system
- C) kinematics
- D) kinesiology

Answer: C

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31) Choose the term that describes the study of the action of forces.

- A) kinetics
- B) mechanics
- C) metric system
- D) qualitative

Answer: A

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32) Choose the term that describes the study of human movement.

- A) kinesiology
- B) mechanics
- C) metric system
- D) qualitative

Answer: A

Accessibility: Keyboard Navigation

33) Choose the term that describes "involving the use of numbers."

- A) quantitative
- B) sports medicine
- C) statics
- D) tennis elbow

Answer: A

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34) Choose the term that describes "involving a nonnumeric description of quality."

- A) qualitative
- B) sports medicine
- C) statics
- D) tennis elbow

Answer: A

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35) Choose the term that describes the system of weights and measures used internationally in scientific applications.

- A) kinetics
- B) mechanics
- C) metric system
- D) qualitative

Answer: C

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36) _____ refers to an excessive loss of bone mineral mass and strength resulting in one or more fractures.

Answer: Osteoporosis

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37) The branch of biomechanics which studies the actions of forces is called _____.

Answer: kinetics

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38) A field that focuses on the prevention of work-related injuries and the improvement of working conditions and worker performance is known as _____ biomechanics.

Answer: occupational

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39) Sport shoes are designed to prevent _____ and enhance _____.

Answer: excessive loading; performance

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40) List four innovations in sport equipment developed by biomechanists.

Answer: Answer may vary.

Accessibility: Keyboard Navigation

41) Explain how equipment innovation has improved performance and/or prevented injury.

Answer: Answer may vary.

Accessibility: Keyboard Navigation

42) Name three professions related to kinesiology and explain how each will benefit from a knowledge of biomechanics.

Answer: Answer may vary.

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43) Explain the difference between qualitative and quantitative problems and give an example of each one that is related to a kinesiology topic.

Answer: Answer may vary.

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44) Within the fields of kinesiology and exercise science, the living organism most commonly of interest to the biomechanist is the human body.

Answer: TRUE

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45) The kinetics of an exercise or sport skill execution is commonly known as form or technique.

Answer: FALSE

Accessibility: Keyboard Navigation

46) Force can be thought of as a push or a pull acting on a body.

Answer: TRUE

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