1. Award: 10.00 points

Work is defined as

- ○ the ability to transform energy from one state to another.
- ○ the ability to utilize oxygen.
- → ○ the product of force times distance.
- ○ the product of distance times power output.

References

Multiple Choice Difficulty: Easy

2. Award: 10.00 points

Power is defined as

- ○ the ability to perform work.
- → ○ work divided by the amount of time required to perform the work.
- ○ the product of work times force (Work × force).
- ○ the product of force times distance (force × distance).

References

Multiple Choice Difficulty: Easy

3. Award: **10.00 points**

The SI unit for work is the

- → ○ joule.
- ○ watt.
- ○ kpm.
- ○ kcal.

References

Multiple Choice Difficulty: Easy

4. Award: **10.00 points**

Direct calorimetry is a means of determining energy expenditure and involves the measurement of

- ○ oxygen consumption.
- → ○ heat production.
- ○ ATP hydrolysis.
- ○ carbon dioxide production.

References

Multiple Choice Difficulty: Easy

5. Award: 10.00 points

The energy cost of horizontal running can be estimated accurately because

- the VO_2 of running is always the same.
- the VO_2 of horizontal running is always 1 MET.
- → the VO_2 increases linearly with running speed.
- none of these answers is correct.

References

Multiple Choice Difficulty: Easy

6. Award: 10.00 points

The most common technique used to measure oxygen consumption in an exercise physiology laboratory is

- closed-circuit spirometry.
- → open-circuit spirometry.
- direct calorimetry.
- computer calorimetry.

References

Multiple Choice Difficulty: Easy

7. Award: **10.00 points**

One MET is defined as a metabolic equivalent and is equal to

→ ○ resting VO_2.

○ 50% of resting VO_2.

○ 200% of resting VO_2.

○ VO_2 max.

References

Multiple Choice Difficulty: Easy

8. Award: **10.00 points**

Net efficiency is defined as

○ work output/energy expended at rest multiplied by 100.

→ ○ work output/energy expended above rest multiplied by 100.

○ work output/energy expended multiplied by 100.

○ energy expended/work output multiplied by 100.

References

Multiple Choice Difficulty: Easy

9. Award: 10.00 points

Exercise efficiency is greater in subjects who

- possess a higher percentage of fast muscle fibers.
- → possess a higher percentage of slow muscle fibers.
- possess 50% fast fibers and 50% slow fibers.
- None of these answers is correct.

References

Multiple Choice Difficulty: Easy

10. Award: 10.00 points

To achieve the highest efficiency during exercise, the optimum speed of movement

- → increases as the power output increases.
- decreases as the power output increases.
- remains constant as the power output increases.
- increases as the power output decreases.

References

Multiple Choice Difficulty: Easy

11. Award: **10.00 points**

The SI units used to describe power are

- Newtons.
- joules.
- → watts.
- joules per second.

References

Multiple Choice Difficulty: Easy

12. Award: **10.00 points**

Net efficiency _____ as work rate increases.

- increases
- does not change
- → decreases
- follows a sine wave pattern

References

Multiple Choice Difficulty: Easy

13. Award: **10.00 points**

A kilocalorie is equal to

- 100 calories.
- → 1,000 calories.
- 4,186 kilojoules.
- 4.186 joules.

References

Multiple Choice Difficulty: Easy

14. Award: **10.00 points**

In order to standardize terms for the measurement of energy, power, work, etc., scientists have developed a common system of terminology called

- the English system.
- the metric system.
- → system international units (SI).
- None of these answers is correct.

References

Multiple Choice Difficulty: Easy

15. Award: 10.00 points

The incline of a treadmill is expressed in units called percent grade. Percent grade is defined as

- the angle of the treadmill expressed in degrees.
- the amount of horizontal travel of the treadmill belt per minute.
- the hypotenuse divided by the vertical rise.
- → the vertical rise per 100 units of belt travel.

References

Multiple Choice Difficulty: Easy

16. Award: 10.00 points

The term ergometry refers to

- the measurement of heat production.
- → the measurement of work output.
- the hypotenuse divided by the vertical rise.
- the vertical rise per 100 units of belt travel.

References

Multiple Choice Difficulty: Easy

17. Award: 10.00 points

Calculating the work performed on a cycle ergometer requires that you know all of the following *except*

→ ○ subject's body weight.

○ resistance against flywheel.

○ pedaling speed (i.e., distance traveled).

○ duration of exercise.

References

Multiple Choice Difficulty: Medium

18. Award: 10.00 points

Compared to a highly economical runner, runners that exhibit poor running economy would require

○ a lower VO_2 at any given running speed.

→ ○ a higher VO_2 at any given running speed.

○ the same VO_2 at any given running speed.

○ None of these answers is correct.

References

Multiple Choice Difficulty: Medium

19. Award: 10.00 points

The treadmill angle (expressed in degrees) can be determined by

- visual inspection of the angle of the treadmill.
- trigonometric computations.
- using a measurement device called an inclinometer.
- → Both trigonometric computations and using a measurement device called an inclinometer answers are correct.

References

Multiple Choice Difficulty: Medium

20. Award: 10.00 points

The measurement of oxygen consumption during exercise can provide an estimate of metabolic rate. The rationale behind the use of oxygen consumption to estimate metabolic rate is:

- that measurement of oxygen consumption provides a direct estimate of how much carbohydrate is used a fuel source.
- → that a direct relationship exists between oxygen consumed and the amount of heat produced in the body.
- that measurement of oxygen consumption provides a direct estimate of how much fat is used a fuel source.
- None of these answers is correct.

References

Multiple Choice Difficulty: Medium

21. Award: 10.00 points

During cycle ergometer exercise, net efficiency decreases as the work rate increases. The mechanism to explain this observation is

- → ○ the relationship between energy expenditure and work rate is curvilinear rather than linear.
- ○ the energy requirement of exercise decreases as work rate increases.
- ○ that, independent of work rate, oxygen consumption during exercise always increases over time.
- ○ None of these answers is correct.

References

Multiple Choice Difficulty: Medium

22. Award: 10.00 points

Calculate the power output when an individual performs 700 joules of work in one minute.

- → ○ 11.7 watts
- ○ 117 watts
- ○ 42,000 watts
- ○ Power cannot be calculated with the information provided.
  1 watt = 1 joule per second

References

Multiple Choice Difficulty: Hard

23. Award: 10.00 points

A subject performing a 10-MET activity would have an oxygen consumption of approximately

- 10 ml•kg^{-1}•min^{-1}.
- 25 ml•kg^{-1}•min^{-1}.
- → 35 ml•kg^{-1}•min^{-1}.
- 45 ml•kg^{-1}•min^{-1}.

References

Multiple Choice Difficulty: Hard

24. Award: 10.00 points

Calculate the total amount of work performed in 5 minutes of exercise on a cycle ergometer, given the following:

Resistance on flywheel = 30 Newtons
Cranking speed = 50 revolutions per minute
Distance traveled per revolution = 6 meters
1 joule = 1 newton-meter

- 9,000 joules
- 4500 joules
- → 45,000 joules
- Total work performed cannot be calculated given the information above.
  1 joule = 1 Newton-meter

References

Multiple Choice Difficulty: Hard

25. Award: 10.00 points

Compute the power output (watts) during 60 seconds of treadmill exercise, given the following:

Treadmill grade = 10%
Horizontal speed = 100 meters per minute
Subject's body weight = 60 kg (i.e., force = 588.6 Newtons)
1 joule = 1 newton-meter
1 watt = 1 joule per second
1 kcal = 426.8 kpm

- → ○ 98.1 watts
- ○ 981 watts
- ○ 5886 watts
- ○ Power output cannot be calculated given the information above.

References

Multiple Choice Difficulty: Hard

26. Award: 10.00 points

Calculate net efficiency, given the following:

Resting VO_2 = 0.25 liters per minute
Exercise VO_2 = 1.50 liters per minute
Work rate = 100 watts (W) or 612 kilopond meters per minute
1 watt = 1 joule per second
1 kcal = 4186 joules
1 liter VO_2 = 5 kcal or 20,930 joules

- ○ approximately 19%
- ○ approximately 20%
- → ○ approximately 23%
- ○ approximately 28%

References

Multiple Choice Difficulty: Hard