***Exercise Physiology multi choice questions***

1. **There are three energy systems used by the body to produce energy**
2. Anaerobic, aerobic and lactic acid
3. ATP-CP, lactic acid and anaerobic
4. ADP-CP, lactic acid and aerobic
5. ATP-CP, Anaerobic glycolysis and aerobic

1. **Carbohydrates are converted to**
2. Free fatty acids and triglycerides
3. Adenosine tri phosphate
4. Glucose and glycogen
5. Glycogen stored as ADP
6. **What are the by-products of the ATP-CP system?**
7. Lactic acid
8. There are none
9. Carbon dioxide and water
10. Oxygen
11. **What is the approximate duration of the anaerobic glycolysis system during maximal exercise?**
12. 2.5 minutes
13. 30 seconds
14. 10 seconds
15. 1 minute
16. **What is oxygen deficit?**
17. Supply of oxygen is insufficient for the intensity of the exercise
18. Period of time where the athlete is working aerobically
19. Replenishment of oxygen during sub-maximal activity
20. All of the above
21. **Which of the following *does not* occur during recovery from exercise?**
22. Removal of lactic acid
23. Replenish ADP stores
24. Supply oxygen to the heart and respiratory muscles
25. Supply oxygen to body tissues
26. **Activities that mainly utilise the aerobic system?**
27. Weight lifting, pole vaulting, 100m sprint
28. 200m sprint, 50m swim, volleyball
29. Triathlon, 1500m run, netball
30. Soccer, darts, 5km race walking
31. **Which of the following is not true for the ATP-CP systems**
32. It provides energy using carbs
33. It only lasts for about 10 – 12 seconds
34. It supplies energy anaerobically
35. It can rapidly supply of ATP due to its presence in the muscle
36. **Which of the following determines which energy system the body uses**
37. Intensity and duration of the activity
38. Enjoyment levels
39. Aerobic capacity
40. Anaerobic capacity
41. **What is VO2 max?**
42. An athletes anaerobic capacity
43. An athletes aerobic capacity
44. Volume of oxygen in the lungs
45. Volume of oxygen in the blood (10)

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1. **ATP stands for?**
   1. Adenosine Triphosphate
   2. Anaerobic Triphosphate
   3. Aerobic Triphosphate
   4. Athlete Training Program
2. **Which of the following is a disadvantage of the ATP-PC system**
   1. It produces Lactic acid
   2. It is not very powerful
   3. It only last around 10 seconds
   4. It produces lactic acid
3. **Which of the three energy systems *DOES* require oxygen?**
   1. ATP-CP
   2. Oxidative System
   3. Anaerobic Glycolytic System
   4. Long distance system
4. **What intensity does the ATP – PC system primarily operate in?**
   1. Maximal
   2. Near maximal
   3. Sub – maximal
   4. Rest
5. **The most dominant energy system and most crucial component of fitness used by a marathon runner is:**
   1. Anaerobic Glycolytic System and Speed
   2. ATP-CP and Muscular Endurance
   3. Aerobic System and Cardiovascular Endurance
   4. Aerobic System and Flexibility
6. **All** **three energy systems create:**
   1. Pyruvic acid
   2. ATP
   3. Carbohydrates
   4. Lactic Acid
7. **An athlete takes five seconds to sprint 30 meters at maximum intensity. Which system is contributing the most during this sprint?**
   1. Aerobic
   2. Muscular
   3. ATP-CP
   4. None of the above.
8. **An athlete repeats three high-intensity sprints of 200m with short, active rest periods between each sprint. Which system is contributing the most during this activity?**
   1. Agility
   2. Oxidative
   3. ATP-PC
   4. Anaerobic Glycolysis
9. **Which of the following describes the order (from first to last) in which food sources are processed by the body to produce ATP?**
   1. Carbohydrates, proteins, fats
   2. Carbohydrates, fats, protein
   3. Fats, carbohydrates, protein
   4. Protein, carbohydrates, fats
10. **Which of the following best describes the percentage contribution of each energy system for an athlete running continuously for three minutes?**
    1. 10% ATP-CP, 30% Anaerobic Glycolytic, 60% Oxidative
    2. 30% ATP-CP, 60% Anaerobic Glycolytic, 10% Oxidative
    3. 60% ATP-CP, 30% Anaerobic Glycolytic, 10% Oxidative
    4. 60% ATP-CP, 10% Anaerobic Glycolytic, 30% Oxidative

(10)

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1. **The food we eat is digested into:**  
   (a) glucose, free fatty acids and amino acids  
   (b) glucose, glycogen and fats  
   (c) creatine phosphate, minerals and glycogen  
   (d) triglycerides, protein and carbohydrates
2. **Adenosine triphosphate**  
   (a) occurs in the muscle cells in only small amounts  
   (b) is the immediate source of energy for the muscle cells  
   (c) releases energy when it breaks down to ADP and phosphate  
   (d) all of the above
3. **The anaerobic energy system is made up of the following:**  
   (a) ADP - CP  
   (b) ATP - CP  
   (c) Anaerobic glycolysis  
   (d) ATP – CP and Anaerobic glycolysis

4) **The amount of ATP stored by the body is limited. The amount is between:**  
 (a) 0 – 40 grams in total   
 (b) 40 – 50 grams in total  
 (c) 80 – 100 grams in total  
 (d) 1001 – 1200 grams in total

5) **Twenty seconds into an athletic event such as the 200 metre sprint, two energy systems are contributing approximately the same. They are the:**

(a) ATP-CP and Aerobic systems  
 (b) ATP-CP and Lactic Acid systems  
 (c) Lactic Acid and Aerobic systems  
 (d) CP and Lactic acid systems

6) **How is lactic acid removed from the body**

(a) The body naturally gets rid of lactic acid through metabolism  
(b) By eating extra carbs after exercise  
(c) By eating protein after exercise  
(d) By having an ice bath

7) **When switching from glycogen to free fatty acids as the major fuel source in a marathon, the performer must slow down because**

(a) more oxygen is required to resynthesise ATP and less is available to working muscles  
(b) more processes are required in breaking down free fatty acids and hence ATP is resynthesised at a slower rate  
(c) it is likely that the performance will increasingly start to become anaerobic  
(d) all of the above

8) **The ATP-CP system provides energy mostly at the start of an explosive activity because**

(a) it is impossible to release ATP using the aerobic system in such a short period of time  
(b) it requires the least number of chemical reactions to break down CP and resynthesise ATP  
(c) it is readily available at the muscle site  
(d) all of the above

9) **Thirty eight molecules of ATP can be produced for each molecule of glucose. Which energy system are we referring to?**

(a) the lactic acid system  
(b) the ATP-CP energy system  
(c) the aerobic energy system  
(d) the creatine phosphate system

10) **Glycogen results from the combination of a large number of:**

* 1. carbohydrates
  2. glucose molecules
  3. sucrose molecules
  4. low GI foods

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1) **Adenosine triphosphate is comprised of:**

1. one adenosine molecule and two phosphate ions
2. one adenosine molecule and three inorganic ions
3. one adenosine and three phosphate ions
4. one adenosine molecule, fats and glycogen

2) **Human physical activity can only be fuelled by one specific energy source which is called:**

1. adenosine triphosphate
2. glucose
3. adenosine diphosphate
4. carbohydrates

3) **The energy used by a runner to complete a 100 m sprint is predominantly provided by the:**

1. energy stored in the liver
2. lactic acid system
3. muscles stores of ATP
4. ATP - CP system

4) **In completing their 5000m event a runner obtains energy for their muscles:**

1. from contribution by the aerobic energy system only
2. from contribution by the anaerobic energy system only
3. from an even contribution by the aerobic and anaerobic pathways
4. primarily from the aerobic energy system with some contribution from their anaerobic energy systems

5) **The primary food fuel for energy production during high intensity physical activity would be:**

1. CP
2. glucose
3. fats
4. carbohydrates

6) **To produce energy during an ultra - marathon top level athletes:**

1. uses only carbohydrate
2. uses carbohydrates and fats
3. only uses fats
4. uses fats, carbohydrates and a small proportion of proteins

7) **We store enough ATP/CP to power about how many seconds of intense activity:**

1. 2 seconds
2. 5 seconds
3. 8 seconds
4. 10 seconds

8) **Lactic acid is removed during recovery from exercise by:**

1. the anaerobic system
2. anaerobic glycolysis
3. the ATP – CP system
4. the aerobic system

9) **Fats we consume are broken down in the digestive system to:**

a) saturated fats  
b) free fatty acids  
c) triglycerides  
d) unsaturated fats

10) **The by product of anaerobic glycolysis is:**

a) pyruvate  
b) co2  
c) lactic acid (10)

1. 45 seconds into a 1500m run, which energy system would be providing the highest proportion of energy for ATP production?

(a) ATP-CP  
(b) Lactic Acid  
(c) Aerobic  
(d) Anaerobic

2. An increase in cardiac output is a direct response of the increase in both:

(a) blood pressure and tidal volume

(b) blood pressure and stroke volume

(c) heart rate and tidal volume

(d) heart rate and stroke volume

3. An elite junior basketball player wanting to improve their vertical leap and rebounding ability would be best advised to undertake:

(a) fartlek training

(b) continuous training

(c) interval training

(d) plyometric training

4. Rate of perceived exertion, percentage of heart rate maximum and percentage of VO2 maximum are all valid measures for which principle of training?

(a) specificity

(b) intensity

(c) duration

(d) progressive overload

5. After completing a battery of fitness tests, an athlete was able to identify his strengths and weaknesses in the table below.

|  |  |
| --- | --- |
| **Strengths** | **Weaknesses** |
| * Agility * Balance * Reaction time | * Muscular strength * Power * Speed * Cardiorespiratory endurance |

Based on the results in the table above, the athlete is most likely a:

(a) long distance runner

(b) mixed martial artist

(c) surfer

(d) shot putter

6. Which of the following is **not** a long-term adaptation to physical activity?

1. Decrease in resting heart rate.
2. Decrease in stroke volume at rest.
3. Decrease in cardiac output at rest.
4. Increase in blood volume at rest.

7. The primary energy system used during a javelin throw is:

1. Aerobic energy system.
2. Lactic acid energy system.
3. Anaerobic glycolysis energy system.
4. ATP-CP energy system.

8. In their first session, a personal trainer asks their client to perform as many push ups as possible in one minute. This test is designed to primarily measure the client’s:

1. Muscular strength.
2. Cardiorespiratory endurance.
3. Power.
4. Muscular endurance.

9. The athletes in the picture below are participating in which type of training?



1. Flexibility training.
2. Plyometric training.
3. Fartlek training.
4. Interval training.

10. “If you don’t use it, you lose it” best describes which training principle?

1. Intensity.
2. Specificity.
3. Progressive overload.
4. Reversibility. (10)

1. Cardiac Output is a product of:

1. Blood Pressure x Heart Rate (beats per minute)
2. Blood Pressure x Stroke Volume
3. Stroke Volume x Heart Rate (beats per minute)
4. Diastole x Systole

2. The energy used by muscles to contract and produce movement comes from a chemical compound called:

1. Adenosine Triphosphate (ATP)
2. Creatine Phosphate (CP)
3. Adenosine Diphosphate (ADP)
4. Lactic Acid

3. The energy used by a runner to complete a 400m sprint is primarily provided by the:

1. Aerobic System
2. Lactic Acid System
3. Muscles stores of ATP
4. ATP-CP System

4. In completing their event a 5000m runner obtains energy for their muscles:

1. From their aerobic energy system
2. From their anaerobic energy systems
3. From an even contribution by the aerobic and anaerobic pathways
4. Primarily from their aerobic energy system with some contribution from their anaerobic energy systems

5. In the sport of rugby, the ball carrier has to react to the defence quickly, often changing his initial running direction. This is a characteristic of which component of fitness?

1. Muscular strength
2. Agility
3. Muscular power
4. Flexibility

6. The primary food fuel for energy production during high intensity physical activity is

1. PC
2. Protein
3. Fats
4. Carbohydrates

7. ‘You get what you train for’ is a phrase that could be expressed more correctly by the term:

1. Overload
2. Specificity
3. Intensity
4. Training effect

8. For an athlete to increase muscular strength, he/she should:

1. Use heavy weights with many repetitions
2. Use light weights with many repetitions
3. Use heavy weights with few repetitions
4. Use lights weights with few repetitions

9. Which of the following are both an immediate response and a long-term adaptation to exercise?

1. Increased stroke volume
2. Increased blood flow to the muscles
3. Increased arterial *–* venous *O2* difference
4. All of the above

10. An athlete is said to be in oxygen deficit when their oxygen uptake is:

1. less than the oxygen required to produce sufficient energy aerobically
2. greater than the oxygen required to produce sufficient energy aerobically
3. equal to oxygen required to produce sufficient energy aerobically
4. below resting oxygen levels to produce energy aerobically

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1. Which of the following is **not an immediate response** to exercise?

1. Increased respiratory rate
2. Increased blood pressure
3. Decreased resting heart rate
4. Decreased creatine phosphate stores

2. Blood flow changes are an immediate response to exercise. Which of the following parts of the body would you expect to have decreased blood flow in response to running?

1. Skeletal muscles
2. Heart
3. Skin
4. Abdominal organs

3. Which of the following **does not** occur during recovery from exercise?

1. Removal of lactic acid
2. Replenish ADP stores
3. Supply oxygen to the heart and respiratory muscles
4. Supply oxygen to the body tissues

4. The amount of air inhaled or exhaled with one breath is referred to as:

1. Respiratory rate
2. Stroke volume
3. Gaseous exchange
4. Tidal volume\
5. Which one of the following statements about the heart is correct?
6. Cardiac Output is the volume of blood that the heart is able to pump out in one beat
7. Cardiac Output is the volume of blood that the heart is able to pump out in one minute
8. Stroke volume is the volume of blood that the heart is able to pump out in one minute
9. Stroke volume is the volume of blood that the heart is able to take in one beat
10. Which one of the following statements about the heart is correct?
11. Cardiac Output [Q] = Heart Rate [HR] + Stroke Volume [SV]
12. Cardiac Output [Q] = Heart Rate [HR] x Stroke Volume [SV]
13. Cardiac Output [Q] = Heart Rate [HR] - Stroke Volume [SV]
14. Cardiac Output [Q] = Heart Rate [HR] ÷ Stroke Volume [SV]
15. Which one of the following statements is correct about anaerobic exercise?
16. Anaerobic exercise is where the exercise happens in the absence of oxygen
17. Anaerobic exercise is where the energy needed for exercise is provided in the presence of oxygen
18. Anaerobic exercise is where the energy needed for exercise is provided in the absence of oxygen
19. Anaerobic exercise is where energy is not needed for exercise
20. Which one of the following statements is correct about aerobic and anaerobic physical activities?
21. Road cycling and golf putting are examples of activities where energy is anaerobically
22. Sprinting and shot putting are examples of activities where energy is anaerobically
23. Walking and pole vaulting are examples of activities where energy is aerobically
24. Squash and rock climbing are examples of activities where energy is aerobically
25. Which one of the following statements concerning team games is correct?
26. During team games the activities are mainly anaerobic
27. During team games the activities are mainly aerobic
28. During team games the activities are often both aerobic and anaerobic
29. During team games the activities are rarely anaerobic
30. Which one of the following reactions summarising aerobic energy production is correct?
31. Glucose + Oxygen → Carbon Dioxide + Water
32. Glucose → Energy + Carbon Dioxide + Water
33. Glucose + Oxygen → Energy + Carbon Dioxide
34. Glucose + Oxygen → Energy + Carbon Dioxide + Water

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1. Which one of the following reactions summarising anaerobic energy production is correct?
2. Glucose → Energy + Oxygen
3. Sucrose → Energy + Lactic Acid
4. Glucose + Oxygen → Energy + Carbon Dioxide
5. Glucose → Energy + Lactic Acid
6. Which one of the following correctly identifies E.P.O.C?
7. Extra Pure Oxygen Calories
8. Extra Pure Oxygen Consumption
9. Excess Post-Exercise Oxygen Consumption
10. Excess Post-Exercise Oxygen Calories
11. Which one of the following statements about EPOC is correct?
12. EPOC occurs because of aerobic exercise
13. EPOC removes lactic acid
14. EPOC occurs in anticipation of exercise
15. EPOC prevents sweating
16. Which one of the following statements about the immediate effects of exercise is NOT correct?
17. Heart rate increases
18. Breathing rate increases
19. Oxygen levels increase
20. Temperature increases
21. Which one of the following is correct about bradycardia?
22. Bradycardia is a reduced resting heart rate
23. Bradycardia is an increased stroke volume
24. Bradycardia is an increased cardiac output
25. Bradycardia is an increase in heart muscle
26. Which one of the following is the correct definition of balance?
27. The ability to keep your mass stable
28. The ability to keep your base of support in the centre of your balance
29. The ability to maintain your base of support table
30. The ability to maintain the centre of mass over the base of support
31. In which one of the following activities is balance an important fitness component?
32. 100-metre sprint
33. Springboard diving
34. Gymnastics beam routine
35. Rowing
36. Which one of the following fitness components is defined as the ability of the heart and lungs to supply oxygen to the working muscles?
37. Flexibility
38. Cardio-vascular endurance
39. Balance
40. Co-ordination
41. Which one of the following fitness components is defined as the ability to use different (two or more) parts of the body together smoothly and efficiently?
42. Flexibility
43. Reaction time
44. Balance
45. Co-ordination
46. Which one of the following is the correct definition of co-ordination?
47. The ability to catch and hit balls efficiently
48. The ability to use the arms and legs to move efficiently
49. The ability to use different parts of the body together smoothly and efficiently
50. The ability to move easily and quickly into positions
51. In which one of the following activities is co-ordination an important fitness component?
52. Goalkeeping
53. Springboard diving
54. Gymnastics beam routine
55. Rowing
56. Which one of the following fitness components is defined as the range of movement possible at a joint?
57. Flexibility
58. Reaction time
59. Balance
60. Co-ordination

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1. Which one of the following fitness components is defined as the ability of a muscle to undergo repeated contractions avoiding fatigue?
2. Flexibility
3. Muscular endurance
4. Balance
5. Co-ordination
6. Which one of the following is the correct definition of muscular endurance?
7. The ability of a group of muscles to contract efficiently
8. The ability of a muscle group to delay fatigue
9. The ability of a group of muscles to contract repeatedly
10. The ability of a muscle to undergo repeated contractions and avoid fatigue.
11. Which one of the following fitness components is defined as the product of strength and speed?
12. Flexibility
13. Muscular strength
14. Power
15. Co-ordination
16. In which one of the following activities is power NOT an important fitness component?
17. Rugby scrum
18. Springboard diving
19. Gymnastics balance
20. Rowing
21. Which one of the following is the correct definition of reaction time?
22. The time taken to complete a response
23. The time taken to initiate a stimulus
24. The time taken to react
25. The time taken to initiate a response to a stimulus
26. In which one of the following activities is reaction time an important fitness component?
27. Rugby scrum
28. Springboard diving
29. Basketball shooting
30. Rowing
31. Which one of the following fitness components is defined as the maximum rate at which an individual is able to perform a movement?
32. Speed
33. Reaction time
34. Power
35. Co-ordination
36. Which one of the following tests would you use to measure power?
37. A curl conditioning test
38. A multistage fitness test
39. A one rep max test
40. A vertical jump test
41. Which one of the following best describes the fitness components needed by a goalkeeper?
42. Stamina, agility and strength
43. Agility, balance and speed
44. Reaction time, power and strength
45. Balance, co-ordination and agility
46. Which one of the following best describes the fitness components needed by a trampolinist?
47. Stamina, agility and strength
48. Agility, balance and speed
49. Reaction time, power and strength
50. Flexibility, co-ordination and agility

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1. Which one of the following describes the fitness components needed by a discus thrower?
2. Stamina, agility and strength
3. Agility, balance and speed
4. Reaction time, power and strength
5. Flexibility, co-ordination and stamina
6. Which one of the following identifies some of the main principles of training?
7. Stamina, overload and reversibility
8. Overload, reversibility and tedium
9. Specific, frequency and progression
10. Frequency, intensity and type
11. Which one of the following correctly explains the S in the principles of training?
12. Specific to the activity and the performer
13. Suitable to the performer and the season
14. Safe for the performer
15. Special for the activity concerned
16. Which one of the following correctly explains the principle of reversibility?
17. Doing the training exercises in reverse order
18. Reserving a time and place for training
19. Losing fitness because of not training
20. Resting in order to allow training to have an effect
21. Which one of the following correctly explains how to overload?
22. Increase frequency, intensity and time
23. Increase fitness, intensity and type
24. Increase frequency, interval and time
25. Increase fitness, interval and type
26. Which one of the following types of training would be best for a road cyclist?
27. Circuit training
28. Plyometrics
29. Continuous training
30. Fartlek training
31. Which one of the following types of training would be best for a gymnast?
32. Circuit training
33. Weight training
34. Continuous training
35. Fartlek training
36. Which one of the following types of training would be best for a shot putter?
37. Circuit training
38. Weight training
39. Continuous training
40. Fartlek training
41. Which one of the following types of training would be best for a 400-metre runner?
42. Circuit training
43. Weight training
44. Plyometrics
45. Fartlek training