

GCSE PE Structured questions

1a Applied anatomy and physiology

Understand the structure and functions of the skeleton

1. Describe the main functions of the skeletal system that keep the body healthy and active. [4]

Four marks for 4 from:

- A. *Shape/support*
- B. *Blood cell (red) production*
- C. *Mineral production/store*
- D. *Protection*
- E. *To be able to move/keep moving/being mobile/leverage*

2. How does the skeletal system provide a framework for movement? [4]

4 marks for four from:

- A. *Joints*
- B. *Points of attachment for muscles*
- C. *Short bones - fine movements*
- D. *Long bones - gross movements*
- E. *Flat bones protect organs*

Understand the structure and functions of synovial joints

3. Explain the function of synovial fluid in joints. [3]

3 marks for 3 from:

- A. *Lubricates the joint*
- B. *Thus protecting (cartilage)/prevents injury*
- C. *Ensures smooth/unobstructed/efficient movement/prevents friction*
- D. *This is secreted into the joint by the synovial membrane e.g. knee joint*
- E. *Nourishes the cartilage*
- F. *Helps to stabilise the joint*

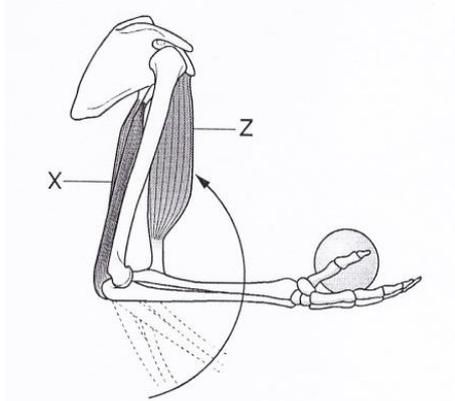
4. Describe, using an example of a named hinge joint, the structure of a synovial joint. [4]

4 marks for 4 from:

- A. *E.g. - knee, elbow, ankle*
- B. *Joint - where two or more bones meet*
- C. *Has joint capsule*
- D. *Has synovial fluid*
- E. *Has synovial membrane*
- F. *Cartilage (on articulating surfaces)*
- G. *Has ligaments (holding bone to bone)*

Understand the movements involved at different joints

5. Using the diagram of an elbow joint:



- (i) Name muscle X [1]
- (ii) Name muscle Z [1]
- (iii) Identify which muscle is the agonist [1]
- (iv) Identify which muscle is the antagonist [1]

Four marks max for identifying and naming

- (i) *X = Antagonist/Tricep*
- (ii) *Z = Agonist/Bicep*
- (iii) *Agonist is the biceps (brachii)/Z*
- (iv) *Antagonist is the triceps (brachii)/X*

6. Explain, using a practical example for each, what is meant by abduction and adduction. [4]

Four marks for:

- A. Adduction - movement towards mid line of body*
- B. E.g. leg / arm action in breast stroke*
- C. Abduction - movement away from mid line of body*
- D. E.g. - splits / crucifix*

7. Name the **two** bones that form the shoulder joint. [2]

- A. Humerus*
- B. Scapula*

8. Name the **three** bones that form the elbow joint. [3]

- A. Humerus*
- B. Radius*
- C. Ulna*

9. Name the bones that form the knee joint. [2]

- A. Tibia*
- B. Femur*

10. Name the **three** bones that form the ankle joint and state the type of synovial joint found at the ankle. [4]

Four marks for:

- A. *Talus*
- B. *Tibia*
- C. *Fibula*
- D. *Hinge joint*

Understand the names of the major muscles causing movements

11. Identify **two** major muscle groups of the upper body that are used when performing a standing throw of a ball. [2]

Two marks max for: (mark first two only)

- A. *Deltoids*
- B. *Latissimus Dorsi*
- C. *Pectorals*
- D. *Biceps*
- E. *Triceps*

Accept other relevant muscle groups

12. Name the muscles that cause movements at the knee joint. [2]

- A. *Quadriceps*
- B. *Hamstrings*

13. Name the muscles that cause movements at the ankle. [2]

- A. *Gastrocnemius*
- B. *Tibialis anterior*

1b The structure and function of the cardio-respiratory system

Understand the pathway of air into and out of the lungs

1. When we breathe in, air enters our nose and mouth. Identify the other structures through which air passes before entering our lungs. [4]

Four marks for:

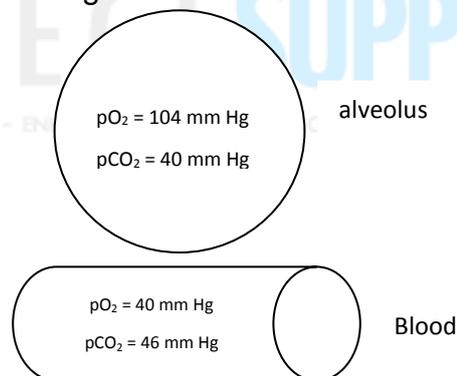
1. *Trachea*
2. *Bronchi*
3. *Bronchioles*
4. *Alveoli*

2. Define tidal volume and state its average value. [2]

- A. *Amount / volume of air entering lungs during normal breathing*
B. *500 mls / 0.5 litres*

Understand gas exchange at the alveoli and the features that assist in gaseous exchange

3. The diagram shows the concentrations of oxygen (pO_2) and carbon dioxide (pCO_2) in the alveoli and lung capillaries. Use the information in the diagram to explain how these gases move. [3]



Three marks for 3 from:

- A. *Process = diffusion*
B. *Gases move from high to low concentration*
C. *Oxygen from alveolus to blood / 104 to 40*
D. *Carbon dioxide from blood to alveolus / 46 to 40*

4. State **three** factors that assist the process of diffusion in the alveoli. [3]

Three marks for 3 of:

- A. *Large surface area*
B. *Thin membranes / cell walls*
C. *Short distance for diffusion*
D. *Steep diffusion gradient / differences in concentration*
E. *Layer of moisture*
F. *Rich / slow blood supply*

Understand the structure and function of blood vessels

5. State the type of blood vessels that carry blood away from the heart. [1]

A. *Arteries / aorta*

6. List **three** features of veins. [3]

Any three from:

- A. *Thin-walled*
- B. *Have valves*
- C. *Large lumen*
- D. *No pulse / stretch*

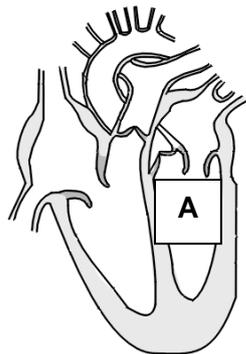
7. State the term used to describe the narrowing of small arteries to re-distribute blood? [1]

A. *Vasoconstriction*

Understand the structure of the heart

8. Name the heart chamber labelled A in the diagram. [1]

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A. *Left ventricle*

Understand the order of the cardiac cycle and the pathway of the blood through the heart

9. Describe the route taken by deoxygenated blood from when it enters the heart until it becomes oxygenated. [4]

- A. *Enters right atria*
- B. *Via vena cava*
- C. *Passes through a-v valve*
- D. *Into right ventricle*
- E. *Systole / contraction*
- F. *blood into pulmonary artery*
- G. *To lungs*

10. Describe the route taken by oxygenated blood from when it becomes oxygenated until it leaves the heart. [4]

Four marks for 4 from:

- A. *From lungs*
- B. *Along pulmonary veins*
- C. *Enters left atria*
- D. *Passes through a-v valve*
- E. *Into left ventricle*
- F. *Systole / contraction*
- G. *Blood into aorta*

Understand the terms cardiac output, stroke volume and heart rate, and the relationship between them

11. State the relationship between cardiac output, stroke volume and heart rate. [1]

- A. *Cardiac output = stroke volume x heart rate*

12. Give **three** short term effects of exercise on the heart. [3]

3 marks for:

- A. *Increase in heart / pulse rate*
- B. *Increase in cardiac output / more blood pumped out per minute*
- C. *Increase in stroke volume*

Understand the mechanics of breathing as the interaction of the intercostal muscles, ribs and diaphragm

13. Name the muscles that cause inspiration at rest. [2]

- A. *Diaphragm*
- B. *Intercostals*

14. Describe the changes that enable breathing to increase during exercise. [3]

Any three for 3 marks

Inspiration helped by:

- A. *Sternocleidomastoid*
- B. *Pectorals*

Expiration helped by:

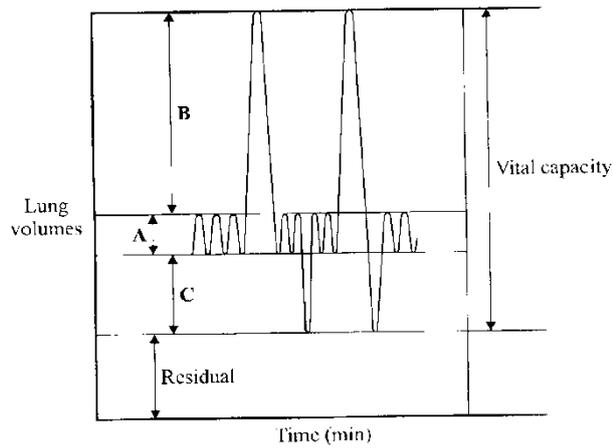
- C. *Abdominals*
- D. *Becomes active*

Understand and interpret lung volumes through spirometer traces

15. Identify the lung volumes are used during exercise. [3]

- A. Tidal volume
- B. Expiratory reserve volume
- C. Inspiratory reserve volume

16. Identify the lung volumes represented by the labels A and B. [2]



- A. *Tidal volume*
- B. *Inspiratory reserve volume*



1c Anaerobic and aerobic exercise

Understand the idea of aerobic and anaerobic exercise during differing intensities

1. Give an example from a team game of aerobic exercise and an example of anaerobic exercise. [2]

- A. *Fast rapid movements - tacking / shooting / dribbling*
- B. *Slow movements - walking / resting / jogging*

2. State the type of exercise that the equation 'glucose → energy + lactic acid' summarises. [1]

- A. *Anaerobic*

3. Write an equation to summarise aerobic energy production. [2]

Mark in two sections:

- A. *Glucose + oxygen →*
- B. *energy + carbon dioxide + water*

Understand the recovery process from vigorous exercise in terms of Excess post-exercise oxygen consumption (EPOC)/oxygen debt

4. Explain the function of EPOC. [2]

- A. *Remove lactic acid*
- B. *Uses oxygen*

5. State **two** factors that may affect the duration of EPOC. [2]

Two marks for 2 of:

- A. *Fitness*
- B. *Intensity of exercise*
- C. *Age*
- D. *Duration of exercise*

Understand methods to help recover from strenuous exercise

6. Describe two ways of avoiding DOMS. [2]

Any two of:

- A. *Ice baths*
- B. *Cool down*
- C. *Massage*
- D. *Rehydration*

7. Describe how ice baths speed up recovery. [2]

Any 2 from:

- A. *Flush out waste products*
- B. *E.g. lactic acid*
- C. *Increase blood flow into muscles after leaving bath*

Understand the immediate effects of exercise (during exercise)

8. Describe the immediate effects of exercise. [3]

Three marks for 3 from:

- A. *Heart rate increases*
- B. *Breathing rate increases*
- C. *Temperature increases*
- D. *Sweating / reddening of skin*

Understand the short-term effects of exercise (24 to 36 hours after exercise)

9. Suggest how lactic acid produced in our muscles, and briefly describe the effects of lactic acid. [4]

Four marks max. One mark for each correct response.

Two marks max for:

- A. *Produced because of lack of oxygen/anaerobic exercise*
- B. *After prolonged/hard high intensity exercise/overworked/working too hard*

Three marks max for:

- C. *Causes fatigue/tiredness*
- D. *May cause us to stop*
- E. *Performer has to slow down/decreases effectiveness*
- F. *Can hurt/painful/aches/soreness*

10. Describe **three** short-term effects of exercise. [3]

Any three from:

- A. *Fatigue*
- B. *Light-headedness*
- C. *Nausea*
- D. *DOMS*

Understand the long-term effects of exercise (months and years of exercising)

11. Describe **four** long term effects of exercise on muscles.

[4]

Four marks for four from:

- A. Increase in size (of muscle fibres) / hypertrophy of muscles*
- B. Increase in strength (of muscle fibres) / power*
- C. Increase in muscular endurance*
- D. Increase in flexibility (of muscle) / elasticity*
- E. Increased tolerance to lactic acid / removal of lactic acid*
- F. Greater potential for energy production/more energy available*
- G. Increase in capillaries / more oxygen / haemoglobin to (working) muscles*

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2 Movement analysis

Understand the different classes of levers found in the body

1. The diagram represents the lever system operating at the elbow joint during the extension phase of a throw



- (i) State the class of lever that operates at the elbow during extension. [1]
- (ii) Identify which parts of the lever system at the elbow that labels A and B represent. [2]

- (i) *First class lever*
(ii) *A - resistance/load or effort/force*
B - resistance/load or effort/force

2. Sketch and label a third class lever system. [2]

- A. *Effort / resistance / fulcrum labelled*
B. *Effort in centre*

3. Sketch and label a second class lever system. [2]

- A. *Effort / resistance / fulcrum labelled*
B. *Resistance/load in centre*

4. Identify which type of lever system operates at the ankle during plantar flexion and state the name of the agonist involved. [2]

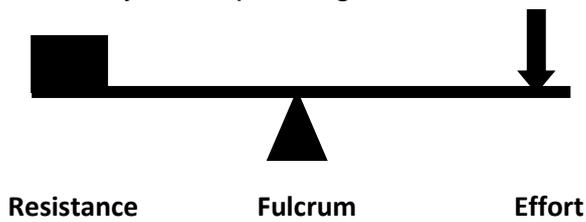
- A. *Second class system*
B. *Gastrocnemius*

Understand the mechanical advantages of different lever systems

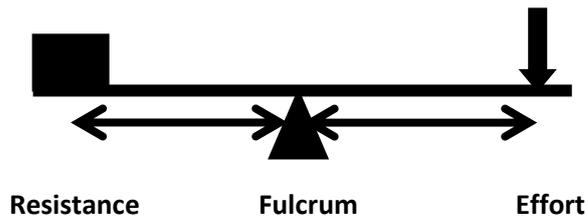
5. State the mechanical advantage of a second class lever system. [1]

- A. *Lift / move heavy weight / apply large force*

6. Sketch the effort arm and the resistance arm on the diagram of a third class lever system operating at the ankle. [2]



- A. Resistance arm identified
B. Effort arm identified



7. Identify the commonest class of lever found in the body and state the mechanical advantage of this type of lever system. [3]

Three marks for:

- A. Third class lever system
B. Rapid movements
C. Large range of movement

Understand how muscles work to cause movements

8. Using an example from a sport of your choice, state what is meant by an isometric muscle contraction. [2]

- A. E.g. gymnastic balance/'get set' at start of race
B. Contraction without movement

9. State the term used to describe the way muscles work in pairs to cause movement. [1]

- A. Antagonistic

10. The diagram shows a weight training exercise



Identify the main agonist and the main antagonist during the exercise shown. [2]

- A. *Agonist - biceps*
- B. *Antagonist - triceps*

11. The diagram shows the action during the downward phase of a squat.



Identify the main agonist and the type of muscle contraction occurring during this action. [2]

- A. *Agonist - quadriceps*
- B. *Type of contraction - eccentric*

12. Describe the function of tendons and how that differs from the function of ligaments. [2]

- A. *Tendons - join muscles to bone*
- B. *Ligaments join bone to bone/hold bones in place*

Understand the planes and axes of different movements

13. Identify the plane and axis of the hip joint action during running. [2]

- A. *Sagittal plane*
- B. *Transverse axis*

14. Identify through what plane and about which axis the elbow action takes place during a press-up. [2]

- A. *Sagittal plane*
- B. *Transverse axis*

15. Identify the plane and axis involved in a cartwheel. [2]

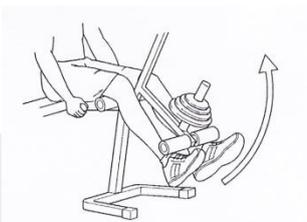
- A. *Frontal plane*
- B. *Sagittal axis*

16. Identify the plane and axis involved in an ice-skating spin. [2]

- A. *Transverse plane*
- B. *Longitudinal axis*

Understand the types of movements that occur at different joints

17. The diagram shows a leg exercise.



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Use the diagram to identify:

- (i) The name and type of joint involved in the movement. [2]
- (ii) The articulating bones associated with this movement. [2]
- (iii) The type of movement taking place. [1]

5 marks in total

(i) *2 marks for:*

- A. *Name – knee*
- B. *Type – hinge/synovial*

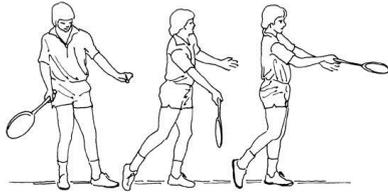
(ii) *2 marks for:*

- A. *Femur*
- B. *Tibia*

(iii) *1 mark for:*

- A. *Extension*

18. The diagram shows a badminton serve



Use the diagram to identify:

- (i) The names of the bones forming the shoulder joint. [1]
- (ii) The name of the type of joint found at the shoulder. [1]
- (ii) The name of the joint action taking place at the shoulder. [1]
- (iv) The name of the main agonist causing this movement. [1]

Four marks in total

- (i) *humerus and scapula*
- (ii) *ball and socket*
- (iii) *flexion*
- (iv) *deltoid*

19. The diagram shows a player kicking a ball

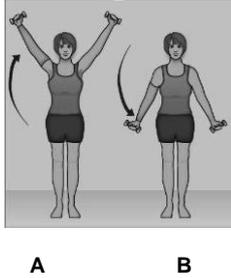


Use the diagram to identify the joint action taking place at:

- (i) the hip, and [1]
- (ii) the knee, during the sequence A-C [1]

- (i) *Flexion*
- (ii) *Extension*

20. The diagram shows performing a weight training movement



- (i) Identify the correct term for each of the movements A and B shown. [2]
(ii) Identify the plane and axis involved in these movements. [2]

Four marks for 4 from:

- (i) A = abduction
B = adduction
(ii) A = Frontal plane
B = Sagittal axis

21. The diagram shows a cricketer bowling.



Identify the **two** actions occurring at the shoulder during the sequence shown and state the name of the agonist muscle for each action. [4]

Four marks for:

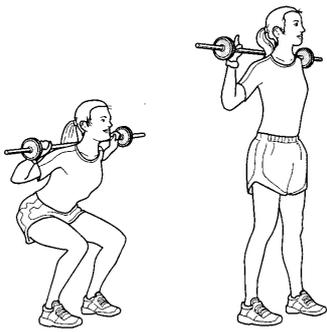
- A. Action – rotation
B. Agonist – rotator cuff
C. Action – extension
D. Agonist – latissimus dorsi

Understand the names of the muscles causing movements at different joints

22. Name the main agonist that causes extension at the knee. [1]

- A. Quadriceps

23. The diagram shows the upward phase of a squat

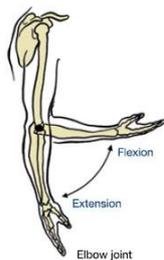


Identify the main agonist causing the movements at:

- (i) the hip [1]
- (ii) the knee [1]
- (iii) the ankle [1]

- (i) *gluteals*
- (ii) *quadriceps*
- (iii) *gastrocnemius*

24. The diagram shows the movements possible at the elbow joint



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Identify the main agonists causing the movements shown.

[2]

- A. *Flexion – biceps*
- B. *Extension - triceps*

3 Physical training

The relationship between health and fitness

1. Define health. [1]
 - A. *Complete physical, mental and social well-being*
2. Define fitness. [1]
 - A. *Ability to cope with demands of environment*
3. Explain how an individual may increase their fitness but suffer from ill health. [3]
 - A. *Fitness – ability to cope with demands*
 - B. *Health – complete physical mental and social well-being*
 - C. *Can improve physical aspect of health, but other areas/social/mental may deteriorate*

The components of fitness

4. Describe how flexibility can help you lead a healthy lifestyle. [4]

four marks for four from:

 - A. *(General) To stop danger of straining yourself / safer (e.g. lifting)*
 - B. *(Specific joint/ muscular) To prevent joint /muscle injuries/healthy joints/better posture*
 - C. *To be able to reach for things easier/greater range of movement*
 - D. *To be able to perform activities that demand flexibility such as gymnastics / enables you to want to do more exercise / enables activity in old age*
 - E. *To be able to move faster/ quicker reactions/more agile*
 - F. *To be more effective in movement technique*
 - G. *To go about everyday activities more easily/ do jobs better*

5. Speed is an important component of fitness.
Explain, using **four** different practical examples, how speed can help in the performance of physical activities. [4]

Four marks for four from: (max two marks if no examples)

- A. *To beat your opponent in a race, e.g. in a sprint race*
- B. *Get away from your opponent e.g. striker running away from defender in football*
- C. *To get to the ball or location before your opponent, e.g. winning the ball in a hockey match*
- D. *To be able to put skills into operation quickly/make skills quick/effective, e.g. quickly perform the smash in tennis*
- E. *Can hit or strike with more force/makes things/projectiles go faster, e.g. quicker run-up and arm action - quicker ball will travel when bowling in cricket*
- F. *You can receive the ball more effectively/you can prepare to receive/respond, e.g. you can get in position*

6. Name and describe a suitable test for flexibility. [2]

- A. *E.g. sit and reach test*
- B. *keeps legs straight; reach forward as far as possible to measure*

7. Describe both plyometrics and weight training. [6]

Sub max 4 per method

Plyometrics

- A. *bounding/hopping*
- B. *On off boxes*
- C. *concentric contractions of muscles*
- D. *and eccentric*
- E. *usually leg muscles*
- F. *needs warm up*
- G. *Very strenuous*

Weights

- A. *Lifting weights*
- B. *machines or free weights*
- C. *provide resistance*
- D. *Uses repetitions / sets*
- E. *needs warm up*
- F. *Targets specific muscles*
- G. *type of interval training / anaerobic*
- H. *Strenuous on muscles and joints*

8. Define agility and describe a suitable test to measure agility. [5]

Four marks for 4 from:

Sub max one mark

- A. *Ability to change direction quickly*
Sub max 4 marks
- B. *Illinois agility run*
- C. *10 metres (x 5 metres)*
- D. *Start lying down*
- E. *Run 6 lengths / 60 metres*
- F. *Weave in and out of cones*
- G. *Time to complete measures agility*

9. Compare the need for cardio-vascular endurance between a long-distance runner and a long jumper. [3]

Three marks for 3 from:

- A. *Cardio-vascular endurance – ability of heart and lungs to deliver oxygen to working muscles*
- B. *Long distance runner – required for duration of (aerobic) event*
- C. *Long jumper – event mainly anaerobic/sprint and jump*
- D. *Cardio-vascular endurance not important*

10. Define strength and identify and describe another component of fitness that is needed for weight-lifting. [2]

Sub max one mark

- A. *Strength – ability to overcome a resistance*
Sub max onemark
- B. *Flexibility – wide range of movement;*
- C. *Speed – rapid movement/move quickly;*
- D. *Co-ordination – combining movements/ arms and legs together;*
- E. *Power – strength x speed/large force quickly;*
- F. *Agility – change direction quickly;*
- G. *Balance – Remaining stable/equilibrium;*

11. Identify **two** components of fitness required by a shot putter. [2]

Two marks for two from:

- A. *Strength*
- B. *Power*
- C. *Speed*
- D. *Flexibility*
- E. *Balance*
- F. *Co-ordination*

12. Tennis players require high levels of power to be successful. State what you mean by the term power. [1]

A. *Strength x speed*

13. Balance is an important aspect of weight-training. State what you mean by the term balance. [2]

Two marks for 2 from:

A. *Maintaining/keeping stable/equilibrium;*

B. *Centre of gravity/mass over base of support;*

C. *Static or dynamic;*

How to evaluate the need for components of fitness in specific physical activities and sport

14. Name **three** components of fitness needed by a goalkeeper in a team game. [3]

Three marks for any three of:

A. *Agility*

B. *Balance*

C. *Co-ordination*

D. *Flexibility*

E. *Power*

F. *Reaction time*

G. *Speed*

15. Apart from speed, name **two** other components of fitness needed by a 100-metre sprinter. [2]

Two marks for any two of:

A. *Balance*

B. *Co-ordination*

C. *Flexibility*

D. *Muscular endurance*

E. *Power*

F. *Reaction time*

16. Using examples, suggest why team games players need power. [2]

Two marks for any two from:

A. *Power = strength x speed*

B. *Apply force quickly*

C. *Needed for e.g. tackles, shooting, heading, etc*

17. The diagram shows a gymnast performing on the asymmetric bars. Identify **three** components of fitness need for this activity. [3]



Three marks for 3 from:

- A. Agility
- B. Balance
- C. C-ordination
- D. Flexibility
- E. Muscular endurance
- F. Power
- G. Strength
- H. Speed

18. Do footballers need cardio-vascular endurance? Justify your answer. [2]

- A. Cardio-vascular endurance – ability to supply oxygen to muscles
- B. Needed by footballers because matches last 90 minutes

19. Do swimmers need to be flexible? Justify your answer. [2]

- A. Flexibility – range of movement at a joint
- B. Larger range of movement means longer application of force – quicker

20. Do tennis players need balance? Justify your answers. [2]

- A. Balance – stay in equilibrium
- B. Need dynamic balance when moving around court

Reasons for carrying out fitness tests

21. Suggest **four** reasons why fitness tests may help a performer. [4]

Four marks for any 4 from:

- A. Identify strengths and weaknesses
- B. Measure initial fitness levels
- C. Monitor improvements
- D. Compare to others
- E. Motivation
- F. Variety

The protocol and procedures that should be followed when carrying out fitness tests

22. Name and describe a suitable test to measure a person's balance. [4]

Four marks for 4 from:

Sub max one mark

A. *Stork balance*

Sub max 3 marks

B. *Stand on two feet with hands on hips*

C. *Lift one leg and place toes alongside knee*

D. *Start timing when subject raises heel off ground*

E. *Finish timing when subject loses balance*

23. Describe the Anderson wall toss test. Which component of fitness does it measure? [4]

Four marks for 4 from:

Sub max one mark

A. *Measures coordination*

Sub max 3 marks

B. *Stand 2-metres from wall*

C. *Throw and catch one-handed*

D. *Alternative hands*

E. *30 seconds duration*

24. Describe the sit and reach test for flexibility. Justify whether this is a suitable test for a swimmer. [4]

Four marks for 4 from:

Sub max 3 marks

A. *Sit on floor with legs straight*

B. *No shoes; Feet flat on sit and reach board*

C. *Reach forward as far as possible (push slider)*

D. *Measure how far past toes*

Sub max 2 marks

E. *Swimmer – limited for leg flexibility/only measures hamstrings/back flexibility*

F. *Definitely not for arms*

25. Describe the vertical jump test for anaerobic power. Justify whether this is a suitable test for a tennis player. [4]

Four marks for 4 from:

A. *Standing upright – stretch and mark reach height/push up wall ruler*

B. *Apply chalk or similar to fingers*

C. *Jump as high as possible and touch wall with fingers*

D. *Difference in standing and jumping height is measure of power*

E. *Tennis – uses legs for power – suitable test*

26. Describe the ruler drop test to measure reaction time. Justify whether this is a suitable test for a 100-metre sprinter. [4]

Four marks for 4 from:

- A. Metre rule held between thumb and index finger at 50 cms point
- B. Release without warning
- C. Subject catches falling ruler
- D. Score in cms – how far did it drop
- E. Not similar to reaction time of sprint start – not suitable

27. Describe the handgrip dynamometer test for strength. Justify whether this is a suitable test for a rugby player. [4]

Four marks for 4 from:

- A. Dynamometer held in dominant hand
- B. Adjust grip to suit size
- C. Maximum effort squeeze
- D. Record score
- E. Only suitable for to mauling/unsuitable for other areas where strength required

The limitations of carrying out fitness tests

28. Using appropriate examples, suggest **three** reasons why fitness tests are limited. [3]

Four marks for 4 from:

- A. Not sport specific / not valid – e.g. ruler drop test
- B. Do not replicate sporting actions – e.g. bleep test/sit and reach test
- C. Non-competitive/ no pressure – e.g. re-tests possible
- D. Many tests unreliable / maximal / rely on motivation – e.g. bleep test
- E. Tests require accuracy in protocol/method often not available – e.g. stork test/Illinois agility run/etc

How qualitative and quantitative data can be gained and used when fitness testing

29. Explain the difference between qualitative and quantitative data. [2]

- A. Quantitative – objective / numbers
- B. Qualitative – opinions / subjective

The principles of training and overload and how they can be applied to training programmes

30. Other than frequency, what are the other components of the FITT principle? [3]

Three marks for 3 from:

- A. *Intensity*
- B. *Time*
- C. *Type*
- D. *Tedium*

31. The main training principles are overload; specificity; progression and reversibility. Describe **three** of these training principles and give a practical example for each. [6]

Six marks for six from:

One mark max for description

One mark max for practical example/equivalent

Overload:

- A. *Work harder than normal / by increasing frequency/intensity/duration*
- B. *E.g. Lifting heavier weights*

Specificity:

- C. *Training should be particular/relevant to needs/relevant energy system used/relevant muscle groups used.*
- D. *E.g. choosing main muscle groups used in activity to train for strength.*

Progression:

- E. *(Gradually) becomes more difficult/demanding/challenging/once adapted then more demands on body (suggest time)*
- F. *E.g. Doing more repetitions of sprints at each training session*

Reversibility:

- G. *Performance/fitness can deteriorate if training/exercise stops/decreases.*
- H. *E.g. If you stop endurance training your stamina will reduce in time.*

The varying training types and the advantages and disadvantages of using them

32. Describe circuit training. [5]

Five marks for 5 of:

- A. *A series of exercises/stations of different exercises/activities*
- B. *Each exercise has its own repetitions*
- C. *A whole circuit can be repeated several times*
- D. *There may be a time limit for reps/sets/circuits*
- E. *Body weight is the main resistance factor*
- F. *Different muscle groups/parts of the body are exercised/all-body work out*
- G. *Can incorporate skills rather than just fitness type exercises*
- H. *The score/time can be recorded (for future goals)*
- I. *Periods of rest between station*

33. Describe the training method of plyometrics. What type of physical activities is plyometrics particularly good for? [4]

3 marks for 3 from:

- A. *Plyometrics involves bounding/hopping / jumping/in–depth jumping*
- B. *When the athlete jumps onto (and off boxes)*
- C. *Muscles have to work concentrically (jumping up)*
- D. *(and) eccentrically (landing)*
- E. *Important that the muscles are warmed and stretched before attempting this type of training*
- F. *This type of training is very strenuous on the muscles and joints and a reasonable amount of fitness must be present before this training is attempted*

Sub max 1 mark for (type of activity)

- G. *This type of training is designed to improve dynamic strength/plyometrics improve the speed with which muscles contract/power/any sport that involves sprinting, throwing and jumping will benefit from this type of training/players of many team sports such as netball or rugby*

34. Describe **four** ways in which continuous training can improve performance in physical activities. [4]

Four marks for 4 from:

- A. *Improves fitness/stamina/(cv)endurance/increases energy levels*
- B. *Can assist weight control/weight loss*
- C. *Decrease in fatigue/less need for rest*
- D. *Increase tolerance to lactic acid*
- E. *Emulates/duplicates the 'real game' situation/prepares for competition*
- F. *Reduces resting heart rate*
- G. *Increases heart efficiency/or adaptations identified (other than reducing resting heart rate)*
- H. *Improved efficiency of vascular shunt*
- I. *Increases lung efficiency/better use of O₂/or adaptations identified*
- J. *Increases muscular efficiency or adaptations identified*
- K. *Reduces blood pressure*
- L. *Reduces risk of health problems/or examples of these problems*

35. Describe **two** advantages and **two** disadvantages of circuit training. [4]

Four marks for four from:

Sub max 3 marks

Advantages

- A. *Variable*
- B. *Large numbers*
- C. *Simple*
- D. *Specific*
- E. *Easy to overload*

Disadvantages

Sub max 2 marks

- F. *Needs space*
- G. *Needs specialist equipment*
- H. *Hard to measure / track intensity*

36. Describe **two** advantages and **two** disadvantages of continuous training. [4]

Four marks for four from:

Advantages: Sub max 2 marks

- A. *Requires little or no equipment*
- B. *Improves aerobic fitness.*
- C. *Can be done virtually anywhere.*
- D. *Simple to do*

Disadvantages - Sub max 2 marks

- E. *Can be boring/tedious.*
- F. *Can cause overtraining injury due to repetitive contractions.*
- G. *Can be time consuming.*
- H. *Not specific to demands of the sport,*

37. Describe **two** advantages and **two** disadvantages of (High Intensity) interval training. [4]

Four marks for four from:

Advantages - sub max 2 marks

- A. *Burns fat / Calories quickly*
- B. *Easily altered to suit individuals*
- C. *Quick*
- D. *Improves aerobic and anaerobic systems*

Disadvantages - sub max 2 marks

- E. *Potential for injuries*
- F. *Needs high motivation*
- G. *Can cause nausea / dizziness*

38. Describe **two** advantages and **two** disadvantages of weight training. [4]

Advantages - sub max 2 marks

- A. *Easily adaptable*
- B. *Relevant to all sports*
- C. *Easy to organise*
- D. *Strength gains*

Disadvantages - sub max 2 marks

- E. *Increased blood pressure*
- F. *Danger of injuries*
- G. *Heavy weights need motivation*

39. List **four** safety principles that should be used when training. [4]

Any four from:

- A. *Warm up / cool down*
- B. *Avoid bouncing / ballistic stretching*
- C. *Wear appropriate clothing / footwear*
- D. *Use taping / bracing if needed*
- E. *Use correct technique / spotters*
- F. *Keep hydrated*
- G. *Avoid over training / use rest*

Specific training techniques – Altitude training

40. Describe the benefits of altitude training. [4]

4 marks for four from:

- A. *Less oxygen at altitude*
- B. *Body produces More red blood cells/haemoglobin*
- C. *Greater oxygen transport capacity/carry more oxygen*
- D. *Greater stamina/cardio-respiratory endurance*
- E. *E.g. marathon/endurance athletes.*

41. Suggest why is altitude training not always as effective as it should be. [3]

4 marks for three from:

- A. *Reduced oxygen concentration – unable to train as hard as previously*
- B. *Loss of fitness while at altitude*
- C. *Altitude sickness*
- D. *Psychological problems – loneliness / etc*
- E. *No benefit to anaerobic performance;*
- F. *Requires several weeks/months to be effective.*

How training can be structured into seasons

42. Describe the different aims involved when dividing the training year into 'seasons'. [3]

- A. *Pre-season / preparation – develop aerobic fitness*
- B. *Competitive phase / season – maintain fitness / develop skills*
- C. *Post season / transition – rest / recover*

The reasons for warming up and cooling down

43. Using a practical example, explain why a warm up is important before exercise. [4]

1 mark for:

- A. *an appropriate warm-up activity (jogging/stretching etc)*

Three marks for 3 from:

- B. *Increase temperature (of muscles)*
- C. *To improve performance/technique*
- D. *Raise heart rate/increase blood supply*
- E. *Rehearse skills*
- F. *Mentally prepare/get in the right mood or frame of mind/focus/increase motivation*
- G. *To increase/enable greater flexibility/loosen joints*
- H. *Reduces risk of muscle strain/reduce injury*
- I. *Improves speed/strength of muscular contractions*
- J. *Raise oxygen uptake/increase O₂ supply to muscles*

44. Describe a cool down exercise and explain why you should cool down after physical activity. [4]

One mark for:

Description:

- A. *Description of a suitable cool down exercise, e.g. jogging around the pitch after a game, followed by some stretching exercises mobilising the main muscle groups.*

Explanation:

Three marks max. One mark for each correct response.

- B. *(To speed up) remove/get rid of lactic acid/waste products*
- C. *Decreases risk of injury/pulling muscle*
- D. *Decreases risk of muscle soreness/cramp/stiffness*
- E. *Prevent blood pooling*
- F. *Prevent feeling tired*
- G. *Gradually decrease heart rate/blood pressure*
- H. *Gradually decrease body temperature*
- I. *Gradually decrease breathing rate/to stop feeling dizzy/faint/sick*
- J. *Psychological benefits/makes you calm down*

45. Describe an effective warm up in a physical activity of your choice. [5]

Five marks for five from:

- A. Raise pulse/heart rate/jogging.*
- B. Increasing body/muscle temperature*
- C. Stretch for at least 10+ seconds per main muscle group/ per stretch*
- D. Stretch main muscle groups / those muscles specifically going to be used / use flexibility or stretching exercises.*
- E. Steady breathing/keep control/calm*
- F. To include exercise movements that emulate the 'real game ' situation*
- G. Use of skill drills/practising techniques/shots*
- H. Incremental work rate in warm up/start slow and build up work ready for game/competition*
- I. Mental preparation*

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