STRENGTH

Identify 2 types of strength.
Describe a method used to measure each type.

(4)

Type of strength	Name of method	Description of method
1. dynamic strength	(wingate cycle test) RAST test	**2.** 30 sec max cycle test/pedals against a resistance as a %/75g per kg of body weight/ Running-based anaerobic sprint/ Repeated timed sprints
3. Explosive/ elastic strength (legs)	(vertical/broad jump) Wingate cycle test 25m hop test	**4.** Vertical/forward standing measured jump As wingate cycle test above Flying start hop test over 25m
5. Strength endurance (abdominal) (arm strength)	(abdominal conditioning/curl/sit up test) (press up test)	**6.** Timed progressive sit up test to a beep (to exhaustion) Press-ups/ sit-ups in a set amount of time (to exhaustion)
7. Maximum strength	(1 RM/1 rep max) Leg or Hand Grip dynamometer	**8.** Any resistance exercise that the performer can only lift once/1RM Squeeze a handle as hard as possible & record reading
9. Static strength	(any named eg) isometric squats frog stand	**10.** Any eg of applying a force against a resistance while held **still/isometric** contraction

Excluding gender and age, identify 2 physiological factors that can affect the strength of a performer in sport

Discuss the use of plyometrics training as a method of developing dynamic strength

(6)

Physiological factors (sub max 2):

1.	Muscle size/cross sectional area (of the muscle)
2.	Muscle fibre type or % of fast/slow twitch fibres (in the muscle)
3.	Amount of strength training undertaken resulting in hypertrophy of muscle (slightly different from pt 1)
4.	Physical inactivity (due to injury) resulting in reversibility/atrophy of muscle
5.	Amount of testosterone in the body
6.	Joint angle – weakest point in a range of movement is relative to the angle of the joint
7.	Muscle shape Eg multipennate

Plyometrics training (sub max 4):

8.	Doesn't require complicated equipment / bounding / depth jumping
9.	Recruiting more motor units/muscle fibres (to increase force of contraction) / converting eccentric work to concentric work
10.	Important to consider the principles of moderation/overload/warm up/cool down
11.	Most plyometric exercises are associated with the lower leg/but the principle can be applied to all skeletal muscle
12.	More beneficial for athletes who perform explosive movements
13.	There's a decreased risk of injury during competition if undergone plyometrics training
14.	Good pre strength training is required before undertake plyometrics/not appropriate for sedentary individual or novice as can carry an increased risk of injury

Describe the physiological adaptations that you would expect to occur to skeletal muscle after a maximum strength training programme.

(4)

1	Muscle hypertrophy (more total protein) / hyperplasia / muscle cells splitting / more fast twitch muscle fibres
2	Increased concentrations /stores of PC / ATP
3	Increased glycogen stores
4	Increased tolerance to lactic acid / buffering
5	less lactic acid produced for the same workload
6	increase in levels of glycolytic enzymes
7	Recruitment of additional motor units
8	Training may reduce or counteract autogenic inhibition/tension threshold of golgi tendon organs
9	Improved coordination (synchronisation of motor unit activation)

Describe an interval training session designed to improve maximal strength.
Explain the benefits that interval training has over other methods of training.

(5)

Submax 3 marks (interval training)

1. (Type) Weight training.
2. (Work period 1) 1 – 6 reps.
3. (Work period 2) 3 – 5 sets.
4. (Intensity) 1 – 6RM/70%+ RM
5. (Work-relief ratio) 1 : 3 plus/2-5 minutes

Submax 2 marks (benefits)

6. be used to develop anaerobic **and/or** aerobic systems.
7. adds variety to a training programme / flexible training method/prevent boredom
8. allows quality / intensity of work to be maintained / more work completed.
9. onset of fatigue is delayed / allows time for recovery / removal of lactic acid / restoration of PC stores.
10. will allow quicker adaptations.
11. allows games players to incorporate sport specific drills.