Answers to Test your knowledge questions

Nelson Physical Education Studies for WA 2A, 2B

Chapter 7

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**multiple choice**

1. C
2. A
3. B
4. A
5. C
6. A

**short answer**

7. (4 marks: 1 for each point)

Different arrangements of muscle fibres:

- Fusiform fibres: parallel to tendon, large long muscles, slightly weaker, e.g. Gracilis
- Penniform fibres UNIPENNATE: run at angle to tendon and only branch out on one side, e.g. Semi membranosis
- Penniform fibres BIPENNATE: run at angle to tendon and branch out on both sides of tendon, e.g. Rectus femoris
- Penniform fibres MULTIPENNATE: run at angle to tendon but branch out in many directions, e.g. Deltoid

8. (4 marks: 1 for each point)

Training types as they relate to fast-twitch and slow-twitch muscle fibres:

- Type 1 fibres (slow-twitch, red) benefit from aerobic training. If the sport requires endurance-type activities, then this should be the focus, that is, continuous training
- Type 2A fibres (fast-twitch, partially aerobic, white) benefit from training types where force is required over a moderate time period. Training should reflect this to help adapt these fibres to either high power or high endurance. Training, such as interval training, can modify their behaviour
• Type 2B fibres (fast-twitch, anaerobic, white) will benefit from high-intensity training with long periods of rest, such as resistance training
• Specificity of the demands of the sporting event will dictate the most suitable training method, or combination of training methods.

9 (4 marks: 1 for each relevant point)

• Help: strengthens the heart muscle
• Help: tones skeletal muscle and improves oxygen carrying capacity and removal of waste products
• Help: reduce body fat and control weight
• Dangerous: in a hot environment, the double heat load from muscles and circulation can cause severe heat exhaustion
• Dangerous: overtraining can lead to chronic injury
• Dangerous: collisions and accidents can cause major trauma

10 (4 marks)

Upper body: (1 mark for each of following)

Elbow (hinge joint): can only open and close in a single direction
Shoulder (ball and socket): great range of movement, generally circular
Wrist carpals (gliding joint): allows sliding across two flat surfaces

Lower body: (1 mark for each of following)

Hip (ball and socket): great range of movement, generally circular
Knee (hinge joint): can only open and close in a single direction
Foot metacarpals (gliding joint): allows sliding across two flat surfaces

essay style

11 (8 marks, 2 for each subsection)

• Contractibility: where muscles react to a stimulus by shortening. All or none principle states that when a muscle receives a stimulus, it either fires, or it doesn’t. The muscle fibre will contract with all its strength if it fires. It cannot shorten at a low or medium level. Training must focus on making the load high enough to have all muscle fibres fire as often as possible to get significant gains.
• Excitability: ability of a muscle to respond rapidly to a stimulus. This is hindered if potassium and magnesium levels are too low. Most important in cardiac muscle.
• Elasticity: returning to its original form when the force is removed. This works in unison with extendibility, so is reliant on flexibility programmes.
• Extendibility: muscles are capable of stretching when a force is applied. Flexibility is joint-specific, and must have regular maintenance to maintain it.
• These terms all refer to the characteristics of muscle. They help us understand what factors may influence the way we train, and what nutrients our body requires to function optimally.

12 (8 marks, 1 for each relevant point)

• Choose weight-supported activities to reduce chance of joint damage
• Begin with low-impact, short-duration activities and build slowly
• Consider preventative taping to protect ankles
• Set realistic goals of projected weight loss
• Encourage tennis as main option as previous skills will not be lost, leading to positive results
• Ensure adequate stretching to prevent strains
• Supplementary weights training may help develop musculature to improve self-image
• Training methods should consider safe heart rates. (220 – age × 60–80%)
• Ensure correct footwear and equipment is selected to minimise injury