1. What are the differences between functional muscle testing and manual muscle testing?

MMT is the most commonly used method for documenting impairments in muscle strength. Manual muscle testing engages range of motion activity and resistance.

FMT measures and rates your ability to engage in and perform activities required for daily living, such as walking, bending, squatting or holding or lifting objects of various sizes and weights. Functional muscle testing evaluations take into consideration your ability to balance, bear weight, climb stairs, walk, lunge and jump or hop from one spot to another.

2. What criteria are used to determine muscle grades?

Subjectively: OT's impression of amount of actual resistance to give OT's impression of amount of resistance patient will actually tolerate. Objectively: Ability of patient to complete full AROM, Ability to hold body part in position, Ability to move against gravity or move at all. The patient should have good cardiovascular function, be instructed, and be positioned appropriately. Care should be taken with any body part that is under movement restrictions due to fracture, post-surgery, or other tissue integrity issues.

3. List and describe the muscle testing grades that are commonly used (include number grade and word or letter grade).

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Normal (N)</td>
<td>Holds test position against maximal resistance</td>
</tr>
<tr>
<td>4+</td>
<td>Good + (G+)</td>
<td>Holds test position against moderate to strong pressure</td>
</tr>
<tr>
<td>4</td>
<td>Good (G)</td>
<td>Holds test position against moderate resistance</td>
</tr>
<tr>
<td>4-</td>
<td>Good - (G-)</td>
<td>Holds test position against slight to moderate pressure</td>
</tr>
<tr>
<td>3+</td>
<td>Fair + (F+)</td>
<td>Holds test position against slight resistance</td>
</tr>
<tr>
<td>3</td>
<td>Fair (F)</td>
<td>Holds test position against gravity</td>
</tr>
<tr>
<td>3-</td>
<td>Fair - (F-)</td>
<td>Gradual release from test position</td>
</tr>
<tr>
<td>2+</td>
<td>Poor + (P+)</td>
<td>Moves through partial ROM against gravity OR Moves through complete ROM gravity eliminated and holds against pressure</td>
</tr>
<tr>
<td>2</td>
<td>Poor (P)</td>
<td>Able to move through full ROM gravity eliminated</td>
</tr>
<tr>
<td>2-</td>
<td>Poor - (P-)</td>
<td>Moves through partial ROM gravity eliminated</td>
</tr>
<tr>
<td>1</td>
<td>Trace (T)</td>
<td>No visible movement; palpable or observable tendon prominence/flicker contraction</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>No palpable or observable muscle contraction</td>
</tr>
</tbody>
</table>

4. List 3 purposes for assessing muscle strength.

1. Muscle testing in any individual with suspected or actual impaired muscle performance, including strength, power, or endurance.
2. Identification of specific muscles or muscle groups with impaired function.
3. Provides feedback that results in assisting in the plan of treatment, interventions, and therapy.

5. Define endurance and discuss its correlation with muscle strength.

Muscular endurance refers to the ability to perform a specific muscular action for a prolonged period of time. Muscular strength is a muscle’s capacity to exert force against resistance.

6. Define what is meant by substitution.

When a stronger muscle tries to substitute for the weaker muscle. EX: hip abductors weakness: substitution- use of lateral trunk muscles or tensor fascia latae. Also known as compensatory muscles.

7. Outline the procedural steps in performing a manual muscle test and a functional muscle test.

MMT: quiet and comfortable environment
determine if patient can get into the standard testing position-modify if can not move clothing so it does not restrict movement
organize tests so that position changes are minimized
have patient move through available ROM
place one hand to support or stabilize
use other hand to apply resistance if indicated for the grade testing
assist patient to return to resting position
note grade and any modification of standard testing procedure required

8. Outline the suggested sequence for positioning your client to complete a manual muscle test.
   Determine ROM passively. Line up the part with fibers of the muscle to be tested. Provide adequate stabilization. Have the patient attempt motion through the test range. LOOK at muscle movement first, PALPATE at the tendon or muscle belly second. Apply resistance at the end of the range if the muscle is strong enough, called the break test.

9. Picture that describes the functional muscle testing position used in each of the following movements:
   a. Scapular evaluation
   b. Shoulder flexion
   c. Elbow flexion
   d. Elbow extension
   e. Wrist flexion
   f. Wrist extension
1. Define range of motion (ROM).
The full movement potential of a joint, usually its range of flexion and extension.

2. Describe what is meant by active range of motion (AROM).
Patient performs the exercise to move the joint without any assistance to the muscles surrounding the joint.

3. Describe what is meant by passive range of motion (PROM).
Amount of motion at a given joint when an external force or therapist moves the joint.

4. Describe what is meant by active assisted range of motion (AAROM)
Patient uses the muscles surrounding the joint to perform the exercise but requires some help from the therapist or equipment (such as a strap)

5. What is a goniometer?
an instrument for the precise measurement of angles

6. Using the 180° system, what row of figures do you read on the goniometer in measuring the elbow? The shoulder?

7. On what does glenohumeral joint motion depend?
multiaxial synovial ball and socket joint and involves articulation between the glenoid cavity of the scapula and the head of the humerus

8. Why is it important to assess scapula mobility?
Because all the muscles for shoulder movements and stabilization attach, at some point, to the scapula.

9. List several causes of joint limitation.
ankylosing spondylitis, a type of arthritis that primarily affects the spine
osteoarthritis, the most common form of arthritis related to older age and wear-and-tear to the joints
rheumatoid arthritis, an autoimmune form of arthritis caused by your immune system attacking your joints
juvenile rheumatoid arthritis, an autoimmune form of arthritis that occurs in children under the age of 16 years
cerebral palsy, a group of neurological disorders that causes muscle paralysis and loss of body control
the congenital form of torticollis, a stiff neck associated with muscle spasms
Legg-Calve-Perthes disease, a disorder that causes the thighbone to die because of lack of blood flow to the joint
septic hip (and other septic joints), a bacterial infection of the joints
syphilis, a sexually transmitted infection (STI)
inflammation of the soft tissues surrounding the joint (joint swelling)
muscle stiffness
pain
joint dislocation
elbow fractures or fractures in other areas of the body

10. What is the importance of looking at functional activities in doing ROM?
Because functional activities simulate those used in daily activities.

11. What can be done if a particular joint has a permanent ROM limitation?
Adaptive equipment, environmental adaptations

12. List several reasons why a ROM assessment may be needed.
Early disorder intervention, recovery, ADL performance. Movement can help keep your joints flexible, reduce pain, and improve balance and strength. Help maintain normal joint function by increasing and preserving joint mobility and flexibility.
13. Describe the general procedures for evaluating ROM.

**Step 1 - Set the bed level**
To begin with, you need to adjust the bed level of the patient, where you will easily get to the client's body without any difficulty. For this, you can raise the head side of the client's bed.

**Step 2 - Start with the head**
Start with the patient's head by asking him/her to make head movements from left to the right direction slowly. Now let the patient do the head exercise by nodding the head in up and downwards positions. Make sure, the patient does all these exercises in not more than 3 to 10 motions, in a day.

**Step 3 - Now Check the Arms**
Now, check the passive range of motion of patient's arm. You may also ask the patient to do the exercise personally.

- Extend the client's arms softly and hold it at the elbow by keeping it straight on the bed.
- While doing this assist the patient to bring his/her arms straight towards the body (sideways) and then, take it away from the body.
- Now, ask him/her do this exercise in up and down directions. Do the body motions, only number of times are prescribed by the doctor.
- Afterwards, ask the client to loosen up his wrists and make movements of the fingers.

**Step 4 - Do the motion exercises with the knees and legs**
After the head exercises, you also have to check the knees of the client.

- Start it by keeping both of the knees of the patient in straight.
- Ask him/her to loosen the legs.
- Now, ask him to carry the legs near the center of the body and again take it farther.
- Conduct this activity not more than 10 motions, after seeking permission by the doctor.
- Suggest the patient to expand the feet at ankles and loosen up.
- Also, tell the client to twirl and move the toes.

**Step 5 - The 5 types of exercise positions, you must know for passive range of motions:**

**The High-Fowler Position:** - Under this position, you have to keep one side (i.e. The side of the head) of the bed elevated in the range of 60 to 90 degrees. The patient's head should be supported by the elevated side of the mattress. Check that the bed should not be elevated more than 90 degrees.

**Step 6 - The Supine Position**
In this position, the patient has to be positioned on the bed on his/her back with keeping the face in the upward direction and arms stretched on both sides.

**Step 7 - The Semi-Fowler Position**
This position is similar to the high-fowler position with head-side of the bed elevated but not up to 60 or 90 degrees. After laying down the patient on the bed; the head-side of the patient bed should not be raised more than 45 degrees.

**Step 8 - The Sims Position**
Under this position, you have to roll the patient to one side by keeping the legs straight. You can also provide pillows or cushions to patients for proper support and comfort. However, while sleeping this way the patients can bend their legs, if they would want.

**Step 9 - The Lateral Position**
The patient is turned to one side of the bed by kept the leg in flexed form and little raised up with the help of a soft cushion or a pillow. The arm and the leg, which is on the top are positioned a bit elevated.

14. Identify the movements the following symbols represent:
   a. / EXTEN.
   b. √ FLEX.
   c. 🔄🔄 ROTATION