

KINE 427 Modalities Take Home Test

Name _____

1. Voltage can best be described as:
 - a. the resistance to electron movement
 - b. rate of electron movement
 - c. electron population differences
 - d. the flow of electrons from a point of high concentration to a point of low concentration

2. Prolonged immobilization or bed rest.....
 - a. may result in an increase in sarcomere number in the affected musculature if the immobilization is done so as to immobilize the muscle in an elongated position
 - b. may result in a decrease in the total tensile load that the affected musculo-tendinous unit can withstand (support) before failure occurs
 - c. may increase the compliance (distensability) of the affected connective tissue
 - d. both a and b
 - e. all of the above

3. An example of electrical resistance in a single tissue set up in series with the body would be the _____, while _____ would be an example of resistance set up in parallel.
 - a. skin blood
 - b. bone muscle
 - c. fat nerve
 - d. fat skin
 - e. both a and c

4. When electricity enters the body, e⁻ flow is replaced by ion movement toward opposite poles. At the negative pole, _____ ions may cause an _____ reaction which might _____.
 - a. + alkaline soften the tissues
 - b. + acidic harden the tissues
 - c. - alkaline harden the tissues
 - d. both a and b
 - e. both b and c

5. The power (wattage) of an electric current reaching deep body tissues may be increased by:
 - a. decreasing the voltage
 - b. increasing the amperage
 - c. moving the electrodes closer together
 - d. both a and b
 - e. both b and c

6. High voltage pulsed electricity may be effective in:
- fracture healing
 - pain control
 - atrophy prevention
 - both b and c
 - both a and b
7. When a particular tissue at a given tissue depth absorbs ultrasonic energy that is applied transcutaneously (through the skin) we can say that:
- the temperature of that tissue will decrease
 - the attenuation of the sound beam at that point will result in less heat building up in deeper tissues that lie in the path of the beam
 - both a and b
 - none of the above
8. Regarding Ohms law and it's mathematical expression.....
- increasing the resistance will increase the amperage
 - decreasing the voltage will decrease the amperage
 - decreasing the resistance will decrease the amperage
 - both a and b
 - none of the above
9. Select the TRUE statement(s):
- Ballistic types of stretching will not, to any degree, increase flexibility
 - Ballistic types of stretching, if done with enough intensity, may activate the muscle spindles
 - Increasing flexibility essentially involves inducing "creep" in musculotendinous tissue
 - both b and c
 - none of the above
10. The application of superficial heat modalities will cause vasodilation as a result of:
- an axon reflex
 - a polysynaptic reflex that has a synapse in the spinal cord
 - activation of such vasoactive mediators as histamine and prostaglandins
 - all of the above
11. Physiological responses to electricity include:
- decreased aerobic enzyme concentrations in the tissues
 - stimulation of fibroblasts
 - alteration of capillary permeability
 - both a and b
 - both b and c

12. Heat application:
- will decrease the overall metabolic activity of the cells in the heated area
 - will increase the lactate and CO₂ production of the cells in the heated area
 - will increase the pH of the cells in the heated area
 - both b and c
 - all of the above
13. Electric current intensity used in therapeutic modalities usually ranges from:
- 100 - 200 amps
 - 1000 - 2000 milliamps
 - 1-15 milliamps
 - 1000-2000 amps
14. Which of the following result therapeutic benefits might result from superficial heat application?
- a reduction in α-motor neuron firing which might reduce muscle spasm
 - elevation of pain threshold and counter-irritation
 - a substantial reduction in tissue elasticity
 - both b and c
 - both a and b
15. Both electricity and ultrasound may.....
- stimulate / increase the activity of fibroblasts
 - alter the internal environment of the cells of treated tissues
 - both a and b
 - neither of the above
16. As the H₂O content in various selected tissues increase, the attenuation of ultrasound energy passing through that tissue_____, therefore, tissues with a high water content have relatively_____ half value thicknesses.
- decreases small
 - decreases large
 - increases large
 - increases small
 - none of the above
17. Stretching is indicated for all of the following except:
- rehabilitation of a surgically repaired knee that has been immobilized
 - myostatic contractures
 - an undiagnosed range of motion limitation that may be attributable to a capsular (within the joint capsule) bone spur
 - both b and c
 - both a and b

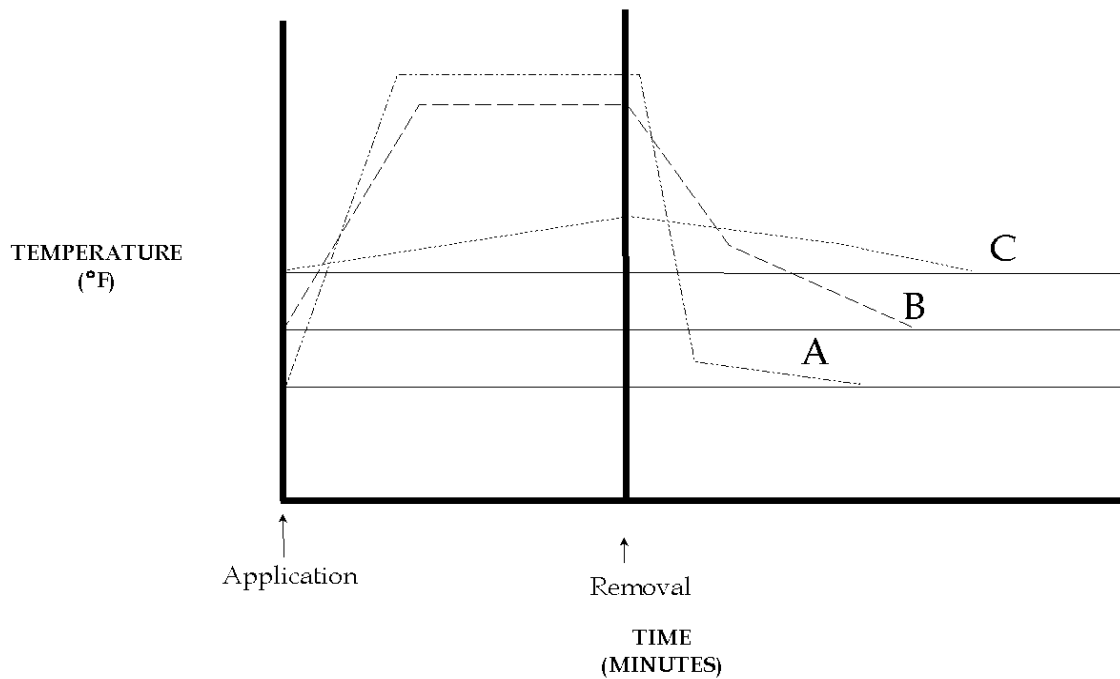
18. In the PNF stretching technique referred to as "contract-relax":
- the pre-stretch contraction of the agonist relaxes the agonist via autogenic inhibition
 - the enhanced stretch effect has nothing to do with the Golgi Tendon Organ
 - contraction of the agonist is followed by a slow stretch of the agonist
 - both a and c
 - both b and c
19. As the difference in temperature between 2 surfaces (mediums) increases, the rate of heat transfer:
- increases in direct proportion
 - decreases in exponential proportion
 - increases in exponential proportion
 - is not affected
 - none of the above
20. Select the true statement regarding the superficial application of cold:
- there is no controversy concerning the resulting physiological alterations
 - it may cause an increase in skin capillary blood viscosity and an increase in joint "stiffness" if applied on a joint
 - will never evoke a vasodilatory response
 - both a and c
 - all of the above
21. It can be said with confidence that cold application will:
- increase nerve conduction velocity and aid in synaptic transmission
 - increase the sensitivity of the muscle spindles
 - decrease the viscosity of superficial tissue fluids
 - both a and b
 - none of the above
22. Select the TRUE statements regarding the application of cold:
- superficial cold is best applied (most convenient and most effective) using ice packs or cold gel packs
 - it is never feasible to use cold as a treatment modality for muscle spasms
 - superficial cold application should not be used on the extremities of patients with severe peripheral vascular disease
 - both a and c
 - both b and c

23. Select the TRUE statement concerning heat therapy:
- optimal temperature elevation for heat modalities ranges from 115° F to 125° F
 - continuous exercise will increase deep muscle blood flow to a greater degree than the application of superficial heat to that same area
 - heat usually decreases capillary and venule permeability
 - both a and b
 - both b and c
24. Vasoactivity caused by heat modalities may be related to:
- a direct neural pathway from cutaneous receptors to vascular smooth muscle
 - an increase in blood and tissue viscosity
 - activation of inflammatory mediators
 - both a and c
 - both b and c
25. Skeletal muscle blood flow:
- is substantially reduced by the application of hydrocollator packs
 - is substantially reduced by the application of paraffin
 - may be increased to therapeutic levels by the proper application of ultrasound
 - both a and b
 - both a and c
26. The maximal depth of penetration for most superficial heating agents is approximately _____ and requires approximately _____ to reach peak temperature at that depth.
- 1 to 2 centimeters 15 to 30 minutes
 - ½ to 1 ½ inches 5 to 6 minutes
 - 5 to 10 centimeters 2 to 4 minutes
27. Infrared radiation from heat lamps:
- is quantitatively in direct proportion to the angle of incidence with respect to the skin
 - is quantitatively in direct proportion to the distance from the skin
 - may significantly increase skeletal muscle blood flow in deep muscle tissue
 - both a and b
 - both b and c
28. As the difference in density of structures adjacent to one another increases, the amount ultrasound reflected by the interface of these structures _____.
- increases
 - decreases
 - does not change

29. The tissue depth (cm) of maximum intensity (watts / cm²) of an ultrasound beam:
- is directly related to the wavelength of the beam
 - is inversely related to the surface area of the transducer head
 - is constant throughout the beam
 - both a and b
 - none of the above
30. As resistance elements are added to a parallel circuit, the total resistance (R_{total}):
- increases
 - decreases
 - does not change
31. As the percentage of water in any given tissue increases, the electrical conductance of that tissue:
- increases
 - decreases
 - does not change
32. As the size (diameter) of an electrode directly over a tissue decreases, the current density in that tissue:
- increases
 - decreases
 - does not change

For Question 33, refer to the graph below

TEMPERATURE ELEVATION OF DIFFERENT TISSUES WITH VARIOUS MODALITIES



33. During a 10 minute treatment of a post acute thigh contusion with heat packs, the temperature change of skeletal muscle tissue would most likely be represented by line _____, while line A would most likely represent _____.

- a. B epidermal tissues
- b. B muscle fascia
- c. C epidermal tissues
- d. C cartilaginous tissue