KMCT COLLEGE OF ALLIED HEALTH SCIENCES
MUKKOM, KOZHIKODE, KERALA.
DEPARTMENT OF PHYSIOTHERAPY.
SECOND YEAR BPT

ELECTROTHERAPY- QUESTION BANK

ESSAY [15 MARKS]

1 What is Biofeedback? Describe in detail the principles of Biofeedback. Add a note on the uses of Biofeedback.

2 What is surged faradism? Describe in detail the mechanism of production of faradic current .Add a note on the physiological and therapeutic effects of faradic current.

3 Define Iontophoresis. What type of current is used in Iontophoresis? Describe the mechanism of Iontophoresis and the therapeutic uses.

4 Describe the current parameters used in the different types of TENS? How does pain modulation occur in each type of TENS? Which type of TENS is best in chronic pain management?

5 Define Pain? What are the types of pain? Describe the gate control theory of pain?

6 Describe Interferential therapy and its parameters in detail?

7 Define Interrupted Direct Current (IDC). Describe the effects of IDC on Innervated and Denervated muscle. Differentiate Faradic from IDC.

8 What are the different types of electrical tests done in electrotherapy department?

9 Define faradic current. Write briefly about modified faradic currents and discuss their physiological effects. Add a note surging of faradic current?

10 What is multi vibrator circuit? Discuss its working.

11 Write about S.D.Curve. What is the significance of doing as S.D.Curve? Explain the results and prognosis.

12 Define Faradic current. Describe the Physiological effects and Therapeutic effects of Faradic current.

13 Define Interferential current. Describe the Parameters and Therapeutic effects of Interferential c Write about Strength Duration curve. Discuss the Strength Duration curve in a case of a Peripheral Nerve Injury which has started regenerating.

14 Define Transcutaneous Electrical Nerve Stimulation. Describe the parameters, Types, Electrode Placement, Advantages, Disadvantages and Contra Indications of Transcutaneous Electrical Nerve Stimulation.

15 Discuss physiological and therapeutic effects of Interrupted Galvanic current. Add a note on contra-indications and dangers of galvanic current.

16 What are the types of peripheral nerve injuries? Discuss the selection of current for neuropraxia and neurotmesis types of injury. Add a note on factors affecting the regeneration of axon.

17 Define Interferential Current. Explain in detail types, indication contraindication, Physiological effect and dangers, parameter of Interferential Current.

18 Explain in detail about the Therapeutic and Physiological effects, uses and techniques of treatment with Interrupted Direct Current.

19 Define transcutaneous electrical nerve stimulation. Describe the parameters, types and physiological effects of transcutaneous electrical nerve stimulation.

20 What is Bio-feedback? Describe the parameters and uses of Bio-feedback.

21 What is Strength Duration Curve? Write the procedure of doing Strength Duration Curve. Describe the characteristic of curve in peripheral nerve lesion.

22 Define Faradic current. Describe the surging of Faradic current. Discuss the therapeutic effects of Faradic current.

23 Define Iontophoresis. Write the physical principle of Iontophoresis. Name the ion used in treating idiopathic hyperhydrosis and explain the treatment procedure of the same.

24 Define Interferential therapy. What is frequency sweep in Interferential therapy? Describe the methods of application and therapeutic effects of Interferential therapy.

25 Describe the types, parameters, therapeutic effects and advantages of Transcutaneous Electrical Nerve Stimulation.

26 Working of Smart Bristo coil and physiological effects of Faradic current.

27 Define Faradic current. Physiological, therapeutic effects indication and contraindications of Faradic current.

28 Explain about the indications, contraindications and methods of application of interrupted direct current.

29 Describe the types of Low frequency current. a) Faradic type current b) Interrupted Galvanic current

30 Discuss the Peripheral Nerve Injuries. Add a note on Physiotherapy management for Radial Nerve Injury.

31 Define Ultra violet radiation . Explain the various types of generators and its production.

32 Define Ultra sound. Explain the Treatment parameters and Physiological effects of ultrasound.

33 Write about the non luminous and luminous generators of IRR, its therapeutic and physiological effects.

34 Define cryotherapy. Explain the methods of application and its therapeutic effects

35 Describe short wave Diathermy, its construction, working, methods of application, physiological and therapeutic effects.

36 Define oscillation. What is capacitance and inductance? Give an example of an oscillating system. How does energy transfer between two circuits take place? Define nodes and antinodes with example

37 Mechanism of Ultrasound production and methods and application for different conditions with therapeutic parameters

38 Production of Infrared radiation and its application methods and precautions during treatment

39 Explain the physical effects of heat and the laws governing radiations.

40 Describe the properties of laser. Explain the principles of application of low level laser and physical and therapeutic effects of laser

41 Describe production of microwave diathermy, its technique of application and dangers.

42 Indications, contraindications and dangers of Ultraviolet radiation (UVR)

43 Define moist heat. Explain the apparatus, technique, indication, contra indication and advantages of hydrocollator pack.

44 Explain in detail about the technique of application of “Laser” and its effects in pain relief, wound healing and in musculoskeletal condition.

45 Define heat and explain in detail about physical effects and transmission of heat. Add a note on apparatus, indications and contra indications, technique of application of liquid paraffin wax bath.

46 Describe the production of Infrared Radiation. Mention about its type of generators and it’s working. Explain about the techniques of the treatment

47 Describe physiological effects of Ultrasound Therapy, its techniques of application and contraindications.

48 Define oscillatory current. Describe in detail about production, physiological and therapeutic effects of SWD

49 Define Microwave Diathermy. Explain in detail about the indication, contraindication, production, physiological, therapeutic effects and its danger.

50 Write in detail various methods of Short Wave Diathermy application.

51 Write in detail the production of Laser and its therapeutic effects.

52 Write about the non luminous and luminous generators of IRR, its therapeutic and physiological effects.

53 Write in detail the production of Ultra sound and write the parameters of Ultra sound for different conditions.

54 Write in detail the production of Ultra violet rays and explain the principles of application of treatment.

55 Describe the superficial heating modalities for patient with Low Backache.

56 Describe in detail about the production, construction and its dangers of SWD.

57 Principles of application of Wax bath for Rheumatoid Arthritis and its home programme.

58 Define Ultraviolet Radiation. Explain the various types of Generators and its production.

59 Describe in detail about the production, construction and its dangers of SWD.

SHORT ESSAY

1) Laws of reflection and refraction.
2) PUVA therapy.
3) Reverse piezo electric effect.
4) Contrast bath.
5) Kromayer lamp.
6) Cable method of Short wave diathermy.
7) Microwave Diathermy.
8) Lewis hunting reaction.
9) Physiological effects of heat.
10) Laser.
11) Construction and principles of Ulrasound.
12) Hydro collator packs.
13) Dosage in ultraviolet rays.

14) Techniques of cryotherapy.
15) Microwave diathermy.
16) Biological changes due to cryotherapy
17) Indications and contra indications of Shortwave diathermy
18) Transmission of Ultrasound by various coupling media.
19) Mercury vapour lamp
20) Photosensitization
21) Hubbard tank
22) Uses and contraindications of cryotherapy
23) Electromagnetic induction
24) Techniques of application in phonophoresis.
25) Electrode placement in Condenser field method in short wave diathermy.
26) Physiological effect and therapeutic effect of ultraviolet radiation.
27) Whirlpool bath
28) Dangers with infrared radiations.
29) Biological effects of pulsed shortwave diathermy.
30) Dip method in paraffin wax application
31) Cold spray
32) PUVA regimen
33) Contrast bath
34) Phonophoresis
35) Physiological effects of cryotherapy
36) Production of ultrasound
37) Paraffin wax bath
38) Therapeutic uses of Infrared radiation
39) Electrode positioning in capacitor field method
40) Physical effects and transmission of heat.
41) Contrast bath.
42) Therapeutic Effects of ultrasound.
43) Properties and technique of LASER.
44) Pulsed shortwave diathermy.
45) Hubbard tank.
46) Physiological effects of UVR.
47) Generators of IRR.

48) Electro magnetic spectrum
49) Modality of treatment and dosage for psoriasis
50) Therapeutic effects of short wave diathermy
51) Techniques of application of ultra sound
52) Physiological effects of ultra violet radiation
53) Dangers and conra indications for cryotherapy
54) Luminous generators
55) Contrast bath
56) Production of microwave diathermy.
57) Excitatory cold.
58) Kromayer lamp.
59) Whirlpool bath.
60) Heat transmission.
61) Laser and its properties.
62) Indications and contra indications of ultra violet radiations.
63) Ultra sound – thermal and non-thermal effects.
64) Difference between nonluminous and luminous generators of IRR.
65) Hydrocollator pack.
66) Transmission of heat.
67) UVR for Skin wounds.
68) Contraindications of Cryotherapy.
69) Physical Properties of LASER.
70) Dangers of Micro Wave Diathermy (MWD).
71) Therapeutic uses of Short Wave Diathermy (SWD).
72) Techniques of application of SWD.
73) Techniques of application of ultrasound therapy.
74) Couplants and its uses.
75) Construction and working of MWD.
76) Luminous and non-luminous generator.
77) Treatment and dosage for Acne Vulgaris.
78) Contrast bath.
79) Paraffin wax bath
80) Spacing in SWD.
81) Laws governing radiation.

82) Magnetron.
83) Treatment parameters of ultrasound.
84) Alpine sun lamp.
85) Ruby laser.
86) Circuit diagram production of SWD and its label.
87) Filters used in UVR.
88) Contrast bath.
89) Hydro collatorpack.
90) Hubbard tank.
91) Contra indications for ultra violet rays.
92) Calculation of dosage in ultra violet treatment.
93) Theraktin tunnel.
94) Drugs used in phonophoresis.
95) Pulsed mode of ultra sound.
96) Management of low back pain.
97) Pulsed SWD and its application.
98) Physiological effects of heat.
99) Therapeutic effects and uses of cryotherapy.
100) Properties of HF current.
101) Cross fire method in SWD.
102) Vapocoolant spray.
103) Emitters and its types
104) Contraindications of Laser.
105) PUVA Apparatus.
106) Sensitizers.
107) Cable method for SWD.
108) Contrast Bath.
109) Physiological Effects of Heat.
110) Micowave Diathermy.
111) Phonophoresis
112) Piezo electric effect.
113) Pain Gate Theory.
114) Pulsed shortwave.
115) Electromagnetic Spectrum.

116) Use of UVR in Alopecia.
117) Microwave diathermy.
118) Condenser field method.
119) Lewis hunting reaction.
120) Water bag method of ultra sound application.
121) Laws governing radiation.
122) Magnetron.
123) Electro-magnetic spectrum.
124) Therapeutic effects of Ultra sound.
125) Indications for infra red radiation.
126) Test dose.
127) Properties of laser.
128) Laser.
129) Non-thermal treatment.
130) Pain gate theory.
131) Ice-cube method.
132) Preparation of Infra-red lamp.
133) Aims of treatment of Wax bath.
134) Fluorescent lamp.
135) Water bag method.
136) Advantages of Cable method.
137) Physiological and therapeutic uses of Lasers.
138) Luminous and Non luminous Generators.
139) Properties of Waves in Ultrasound.
140) Treatment for Plantar Fasciitis.
141) Production of Microwave Diathermy.
142) Effects of Contrast bath.
143) Water bag method.
144) Indication and Therapeutic uses of Biofeedback.
145) Earth Shock.
146) Burst TENS.
147) Types of electrode used in IFT.
148) Strength Duration Curve.
149) Sinusoidal Current.

150) Quadriceps lack.
151) Faradic coil.
152) What are the Therapeutic uses of electricity?
153) Explain Faradic Foot bath.
154) Sweep frequency.
155) Ions used in Iontophoresis.
156) Bio-feed back.
157) Define Erb's palsy and its management.
158) Types of Nerve lesions.
159) Voltmeter.
160) Types of electrodes used in interferential therapy.
161) Brief intense TENS.
162) Synapse.
163) Sinusoidal waveform.
164) Prevention of shock.
165) Functional electrical stimulation.
166) 'F' wave.
167) Wrist drop
168) Bell's palsy.
169) Different theories of pain.
170) Methods of application of ionotoporosis.
171) Explain different types of Wave forms.
172) Functional electrical stimulation.
173) Therapeutic and physiological effects of sinusoidal current.
174) Define transformer and types of transformer.
175) Deltoid inhibition.
176) Treatment method of application of TENS for low back pain.
177) Ammeter.
178) Dangers and preventions of therapeutic currents.
179) Explain in detail on Pain gate theory.
180) Treatment method for radial nerve palsy.
181) Faradism under pressure.
182) Nerve conduction test.
183) Physiological effects of IFT.

184) Dangers of interferential therapy.
185) Action potential.
186) Neuro muscular junction.
187) Types of impulse.
188) Causes of shock.
189) Diadynamic current.
190) H Reflex.
191) Foot drop
192) Types of transcutaneous electrical nerve stimulation.
193) Neuropraxia.
194) Electrotherapy management of Bell's palsy.
195) Functional electrical stimulation.
196) Interrupted direct current.
197) Moving – coil milliampheremeter.
198) Types and production of faradic current.
199) Describe the electrotherapy modalities used to strengthen the muscle
200) Gate control theory of pain.
201) Methods of application of interferential therapy.
202) Uses of biofeedback.
203) Fuse.
204) Earth shock.
205) Effects of a direct current.
206) Semiconductors.
207) Indications and contra-indications of interferential therapy
208) Safety devices used in electrotherapy.
209) Wallerian degeneration.
210) Faradic footbath.
211) Electromyography.
212) Parameters of interferential therapy.
213) Indications of faradic current.
214) Transformer.
215) Strength duration curve.
216) Radial Nerve Palsy.
217) Thermionic Valves.

218) Potentiometer.
219) Transcutaneous Electrical Nerve Stimulation.
220) Faradic Galvanic Test.
221) Deltoid Inhibition.
222) Faradism Under Pressure.
223) Pain Pathway.
224) Volt meter.
225) Parameters of IFT.
226) Saturday night palsy.
227) Deltoid Inhibition.
228) Types of TENS.
229) Accommodation.
230) Iontophorosis.
231) Resistance in series and parallel.
232) Radial Nerve Palsy
233) Triode Valve
234) Rectifiers
235) Interferential Therapy
236) Pain Gate Theory
237) . Smart Bristow Faradic Coil
238) Electric Shock
239) Faradism Under Pressure
240) Propagation of Action potential.
241) Gate control theory.
242) Burst mode TENS.
243) Principles of Biofeedback.
244) Strength-Duration Curve in Peripheral Nerve Injury.
245) Motor Nerve Conduction test.
246) Testing the Electrical Stimulator apparatus.
247) Contraindications of Iontophoresis.
248) Biofeedback and its benefits.
249) Physiological effects of alternating current.
250) Faradic foot bath.
251) Quadriceps inhibition. How would you treat it?

252) Treatment for Bell's palsy left side.
253) Faradic Galvanic test.
254) Chronaxie and Rheobase.
255) Triode valve and its use.
256) Faradic – IDC test.
257) Glidemester effect.
258) Modulation and classification of TENS
259) Sterodynamic IFT
260) Treatment for neuroproxia of Radial nerve.
261) Functional electrical stimulation
262) Fuse
263) Production of Electromagnetic waves.
264) Pain modulation.
265) Galvanic tetanus ratio.
266) Methods of application of Ultrasound.
267) Moving coil Galvanometer.
268) Surgers.
269) Uses of Transformer.
270) Therapeutic effects of High Voltage Pulsed Galvanic Current
271) Physiological effects of Interferential Current.
272) Electromagnetic Induction.
273) Electric shock.
274) Diadynamic Current.
275) Describe the clinical implication of SD curve test.
276) Sinusoidal current.
277) Production of therapeutic Ultrasound.
278) Working of Smart Bristow Faradic Coil.
279) Recording electrodes for electromyography.
280) Neurophysiology of pain.
281) Parameters of Interferential therapy.
282) Propagation of action potential.
283) Diadynamic currents.
284) Physics of Iontophoresis.
285) H-reflex.

286) Therapeutic uses of electricity
287) Explain types of valves used in the electrotherapy units.
288) Describe the electromagnetic spectrum and indicate the unit in which it is utilized.
289) Give the types of modified A.C currents used in physiotherapy. Describe any one in detail.
290) Write in detail about anodal galvanism.
291) List the various tests used in electro diagnosis. Describe any one in detail.
292) What is Bio feedback? Give the importance of its use in physiotherapy.
293) Explain the method of application of phonophoresis and indicate its uses.
294) Give the physiological effects of IRR.
295) Explain the production of ultra sound and give a note on dosimetry in ultrasound.
296) Describe the indications and contra indications of contrast bath usage.
297) Give the principles of Wax bath therapy.
298) Explain the type of applicators used in a MWD unit and its uses.
299) Give the benefits of cold packs usage.
300) Explain the types of electrode placement in Interferential therapy.

SHORT ANSWERS

1) Use of a fuse in electrotherapy unit.
2) Define condenser.
3) Give 2 uses of interrupted galvanic current.
4) Give 2 features of a faradic current.
5) What is cathodal galvanism?
6) Give 2 uses of SD curve used in electrotherapy.
7) Define Pulsed electro magnetic energy.
8) Give 2 uses of a whirlpool bath.
9) Define Ohms law.
10) Define the term nerve conduction velocity.
11) Excitatory Cold.
12) Name the modalities used for Ligament Injuries.
13) Scalds.
14) Contraplanar technique for Osteoarthritis.
15) Ice burn.

16) Inductor.
17) Grid method.
18) Pressure Sores.
19) Piezo-electric effect.
20) Coupling Medium.
21) Magnetron.
22) Crystal laser.
23) Crepe bandage.
24) Capacitor.
25) Acne Vulgaris.
26) Quantum theory.
27) Pulsed Mark: Space ratio.
28) Modalities used for Tennis elbow.
29) Principle of phonophoresis.
30) Papules
31) Cryo stretch.
32) Hydro collator pack.
33) Collimation
34) Psoriasis.
35) Erythema.
36) Paraffin wax bath.
37) Dangers of laser.
38) Moist heat therapy.
39) Mono planar technique of short wave diathermy.
40) Cold laser.
41) Fuse.
42) Magnetron.
43) Test dose.
44) Pulse repetition rate.
45) Grid.
46) Methods of application of ultrasound.
47) Phonophoresis.
48) Laws governing radiation.
49) Ulcer.

50) Electrode spacing in condenser field methods
51) Coupling Media.
52) Thermostat.
53) Types of HF current.
54) Treatment duration of Tennis Elbow.
55) Pulsed diathermy.
56) Electromagnetic spectrum.
57) Gamma rays.
58) Tridmyite formation.
59) Therapeutic uses of IFT.
60) Magnetron.
61) PUVA regimen.
62) Minimal erythmal dose.
63) Inverse square law.
64) Indications for UVR.
65) Techniques of application of UST.
66) Indication and contraindications of moist heat packs.
67) Convection.
68) Cryokinetics.
69) Physical properties of paraffin wax.
70) Laws governing radiation.
71) Ultrasonic field.
72) Diode valve.
73) Indications of wax therapy.
74) Tuning in Short Wave Diathermy.
75) Indication for contrast bath.
76) Cryo cuff.
77) Pressure sore.
78) Alopecia areata.
79) Sensitizers.
80) PUVA regimen
81) Lewis hunting reaction.
82) Electrostatic field.
83) Reverse piezo electric effect.

84) Nodes and antinodes.
85) Cavitation.
86) Pigmentation.
87) Super luminous diode laser.
88) Quick ice.
89) Classification of LASERS.
90) Mark: Space Ratio.
91) Depth of penetration of Ultrasound Therapy.
92) Define frequency.
93) Dangers of Infrared radiation.
94) Physical properties of wax.
95) Wavelength of lasers.
96) Cryokinetics.
97) Conduction.
98) Puva apparatus.
99) Duty cycle.
100) Wavelength of Ultraviolet rays B (UVB).
101) Triode valve.
102) Phonophoresis.
103) Damping of oscillations.
104) Lasing medium.
105) Piezo-electric effect.
106) Desquamation.
107) Any four methods of application of paraffin wax.
108) Ice towel method.
109) Coupling medium.
110) Eddy currents.
111) Method of application of SWD
112) Magnetron
113) Oscillator circuit
114) Photo sensitization
115) Triode valve
116) Latent heat of fusion
117) Parameters of ultrasound

118) Eddy currents
119) Plantar warts
120) Thermostat
121) Vapocoolant spray.
122) Power density of laser.
123) Buoyancy.
124) Actinotherapy.
125) Inverse square law.
126) Transducer.
127) Ionization.
128) Ice burn.
129) UVR new dose calculation formula.
130) Variable condense
131) Conduction
132) List out the techniques of application of LASER
133) How do you prevent the damage to Magnetron
134) Which is converted into vitamin D in skin by Ultraviolet radiation
135) Cosine law
136) Depth of penetration of ultrasound therapy
137) Wavelength of Infrared radiation
138) Define frequency
139) Cryostretch
140) Hydrocollator pack
141) Cavitation
142) Convection and radiation
143) Electrostatic field
144) Desquamation
145) Piezo-electric effect
146) Cryokinetics
147) Electric shock
148) Coupling medium
149) Thermostat
150) RICE
151) Moist heat

152) Erythema
153) Cold laser
154) Cavitation
155) Near field/ Far field
156) Microwave diathermy
157) .Eddy currents
158) Refraction
159) Inverse square law
160) Mono polar technique of Short wave diathermy
161) How is the distance between the Ultra violet lamp and patient calculated?
162) Degrees of erythema.
163) X-rays and Gamma rays.
164) Radiant energy.
165) Convection.
166) Calories.
167) Coupling Media.
168) Cavitation and its types.
169) Properties of Laser.
170) Basic principle in treating sprains.
171) Eddy current
172) Magnetron
173) Drugs used in phonophorosis
174) Structure of skin
175) Theraktin tunnel
176) Erythema
177) Dangers of shortwave diathermy
178) Definition of LASER
179) Physical properties of wax
180) Contraindication of cryotherapy
181) Latency.
182) What is Electromyography?
183) Uses of biofeedback.
184) Sinusoidal current.
185) Resting membrane potential.

186) Factors affecting accuracy of strength duration curve.
187) Shape of interrupted galvanic current.
188) Dangers of Iontophoresis.
189) Motor point.
190) Ions used in Iontophoresis.
191) Capacitance.
192) Principles of Biofeedback.
193) Semiconductors.
194) Chronaxie.
195) Fuse.
196) Motor point and Motor unit.
197) Classification of Nerve Injury.
198) Stimulation of denervated muscle.
199) Ohm's law.
200) Checking of apparatus for Electrical muscle stimulation.
201) Diode valve.
202) H reflex.
203) Feedback Loop.
204) Mutual induction.
205) Ions used in Iontophoresis.
206) Resistance in series and parallel.
207) Nerve conduction test.
208) Describe the type of TENS used for acute pain.
209) Dangers of Iontophoresis.
210) Lenz's law.
211) Types of electric current.
212) Ions
213) Maximum voluntary isometric contraction
214) Orthodromic condution
215) Jouel's Law
216) Chronaxie
217) Compound motor unit action potential
218) Capacitance
219) F wave

220) Syncopated rhythm
221) Lasers
222) Preparation of a patient for E.S
223) What is erythema and how to prevent it?
224) Neuropraxia.
225) Skin resistance test.
226) Wrist drop early stage.
227) Placement and settings for IFT.
228) TENS.
229) Ion used in inotophoresis.
230) Difference between A.C and D.C
231) Waveforms used in Interrupted direct current.
232) Dangers of Interferential current.
233) Sinusoidal current.
234) Advantages of TENS.
235) Recording electrodes in Electromyography.
236) Difference between F-wave and H reflex.
237) Physics of Iontophoresis.
238) Earth shock.
239) Motor unit.
240) Effects of Interrupted direct current on innervated and denervated muscle.
241) Waveforms used in Interrupted direct current.
242) Dangers of Interferential current.
243) Sinusoidal current.
244) Advantages of TENS.
245) Recording electrodes in Electromyography.
246) Difference between F-wave and H reflex.
247) Physics of Iontophoresis.
248) Earth shock.
249) Motor unit.
250) Effects of Interrupted direct current on innervated and denervated muscle.
251) All or none law.
252) Ape thumb deformity.
253) Eddy current.

254) Fibrillation potential.
255) Functional electrical stimulator.
256) Tardy ulnar nerve palsy.
257) SD curve on partially denerveted muscle.
258) Rheobase.
259) Difference between facial palsy and bell's palsy.
260) Hyperemia.
261) Chronaxie.
262) Capacitance.
263) Ions and its uses.
264) Define Farad and Watt.
265) Variable Transformer.
266) Resistance and its types.
267) Kink in Strength Duration Curve.
268) Fatigue Test.
269) Characteristics of Denervated Muscle.
270) Waveforms of Faradic Type Current.
271) Sterodynamic interferential therapy.
272) Motor point.
273) Tinel's sign.
274) Russian current.
275) What is accommodation? How to prevent it?
276) Faradic galvanic test.
277) Ohm's law.
278) H reflex.
279) Dangers of direct current.
280) Neurotemesis
281) Rheostat.
282) Glidemeister effect.
283) H reflex.
284) Action potential.
285) Iontophoresis.
286) Acute pain.
287) Advantages of interferential therapy.

288) Impedance.
289) Types of electrodes.
290) Preparation of patient for electrical stimulation
291) Masking effect.
292) Motor unit.
293) Rheobase.
294) Erythema.
295) Latent period.
296) Triode valve.
297) Feedback loop.
298) Cathode.
299) Joule's law.
300) Advantages and disadvantages of strength duration curve.
301) Suction electrode.
302) Amplitude.
303) Switch.
304) Allodynia.
305) Edema.
306) Cathodal Galvanism.
307) Ohm's law.
308) Effects of chlorine ionisation.
309) Wheal.
310) Electrophoresis.
311) Rheobase.
312) Checking of apparatus for EMS.
313) S.D. curve.
314) Russian current.
315) Electro myography.
316) Ions used in inotophorosis.
317) Uses of transformer.
318) F wave.
319) Joule's law.
320) Hyper hydrosis.

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ELECTROTHERAPY - ANSWER KEYS

ESSAY

1. Biofeedback is a technique that involves using electronic devices to monitor and provide information about physiological processes in the body. This information is then used to help individuals learn how to control these processes voluntarily. The principles of biofeedback include:

   - Awareness:

   Feedback:

   - Learning:
   - Self-regulation

   Biofeedback has various uses in healthcare and wellness, including:

   - Stress management:
   - Pain management:
   - Rehabilitation:
   - Performance enhancement:

2. Surged faradism is a type of electrical stimulation therapy used in physical therapy. It involves the use of a faradic current, which is an alternating current with a high frequency and low intensity. The mechanism of production of faradic current involves:

   - Generator: A generator produces the alternating current, which is typically set at a frequency of 50 to 100 Hz.
   - Electrodes: Two electrodes, one positive and one negative, are placed on the skin near the area being treated. The positive electrode is usually placed over the motor point of the muscle.
   - Muscle contraction: When the current is applied, it stimulates the motor nerves, causing the muscles to contract.

- Intensity control: The intensity of the current can be adjusted to achieve the desired level of muscle contraction.

The physiological effects of faradic current include:

- Muscle contraction:
- Pain relief:
- Improved blood circulation:.

The therapeutic uses of faradic current include:

- Muscle rehabilitation:
- Edema reduction:

3. Iontophoresis is a therapeutic technique that involves the transdermal delivery of medication using a low-level direct current. It is commonly used to administer drugs or chemicals through the skin for localized treatment. The mechanism of iontophoresis involves:

- Electrodes: Two electrodes, one positive and one negative, are used. The electrode carrying the medication is placed over the treatment area, while the other electrode is placed elsewhere on the body.
- Polarity: The medication is either positively or negatively charged, depending on the desired effect. The electrode with the same charge as the medication is placed over the treatment area.
- Current application: A low-level direct current is applied, causing the charged medication ions to migrate through the skin towards the opposite electrode.
- Skin penetration: The medication ions penetrate the skin through the sweat glands, hair follicles, or directly through the skin barrier, depending on the properties of the medication.

The therapeutic uses of iontophoresis include:

- Localized pain management: Iontophoresis can be used to deliver analgesic medications, such as lidocaine, directly to the affected area for pain relief.
- Inflammation reduction: Medications with anti-inflammatory properties, such as corticosteroids, can be administered through iontophoresis to reduce inflammation in specific areas.
- Scar tissue management: Iontophoresis can help soften and break down scar tissue by delivering enzymes or other medications that promote tissue remodeling.

- Hyperhidrosis treatment: Iontophoresis can be used to treat excessive sweating by delivering medications that temporarily block sweat gland activity.

4. Transcutaneous definition ,

   - Conventional TENS: In conventional TENS, a low-frequency (2-4 Hz) and high-intensity current is used. The stimulation is typically delivered in short bursts or continuous mode.
   - Acupuncture-like TENS:
   - Burst TENS: -
   - Modulated TENS:

   Pain modulation occurs in each type of TENS through different mechanisms, including:

   - Gate control theory
   - Endorphin release:
   - Central modulation:

5. Pain can be defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage.

   There are two main types of pain:

   - Acute pain:
   - Chronic pain:

   The gate control theory of pain proposes that pain signals are regulated by a "gate" mechanism in the spinal cord. According to this theory:

   - Large-diameter sensory fibers, such as those activated by touch or pressure, can close the gate and inhibit the transmission of pain signals to the brain.
   - Small-diameter pain fibers, on the other hand, can open the gate and allow pain signals to be transmitted to the brain.

6. Interferential therapy definition

   - Frequency: Interferential therapy typically uses two frequencies, known as carrier frequency and beat frequency. The carrier frequency ranges from 2,500 to 4,000 Hz, while the beat frequency is usually between 1 and 150 Hz.
   - Amplitude: The amplitude of the current is adjusted based on the patient's comfort level and the desired therapeutic effect.

- Electrode placement: Electrodes are placed in a specific pattern to create the interference pattern within the body. The placement may vary depending on the area being treated and the desired outcome.
- Treatment duration

The therapeutic effects of interferential therapy include:

- Pain relief:
- Increased blood flow:
- Muscle relaxation:

7. The different types of electrical tests done in the electrotherapy department include:

- Nerve conduction studies (NCS
- Electromyography (EMG):
- Evoked potentials:

8. Faradic current is an alternating current with a high frequency (50-100 Hz) and low intensity.

- Surge faradism:
- Triangular faradic current:.
- Rectangular faradic current:

The physiological effects of faradic current include:

- Muscle contraction:
- Pain relief

9. A multivibrator circuit is an electronic circuit that generates a continuous output waveform with alternating high and low states. It consists of two amplifying devices, such as transistors or op-amps, connected in a feedback loop.

The working of a multivibrator circuit involves the following steps:

- Initial state: One amplifier device is in the on state while the other is in the off state. The on state amplifier drives the output to a high state.
- Change of state: A triggering signal or a change in the input voltage causes the on state amplifier to switch off and the off state amplifier to switch on. This changes the output to a low state.
- Feedback: The change in the output voltage is fed back to the amplifiers, causing the off state amplifier to switch off and the on state amplifier to switch on again.

This completes the cycle, and the output waveform alternates between high and low states.

10. The Strength Duration (S.D.) definition

- Diagnosis: The S.D. curve can help diagnose nerve injuries or neuropathies by identifying changes in the excitability threshold. Abnormalities in the curve shape or position can indicate nerve damage or dysfunction.
- Prognosis: By monitoring the changes in the S.D. curve over time, healthcare professionals can assess the progression of nerve regeneration and recovery following an injury or surgical intervention.
- Treatment planning: The S.D. curve can guide the selection of appropriate electrical stimulation parameters for nerve rehabilitation, such as determining the optimal intensity and duration of the stimulation.

11. Faradic current, as mentioned earlier, is an alternating current with a high frequency (50-100 Hz) and low intensity. The physiological effects of faradic current include:

- Muscle contraction:
- Pain relief:
- Improved blood circulation:

The therapeutic effects of faradic current include:

- Muscle rehabilitation
- Pain management:
- Edema reduction:

12. Interferential current definition

- Beat frequency: The beat frequency is the difference between the two carrier frequencies. It is usually set between 1 and 150 Hz and is used to modulate the interference pattern.
- Electrode placement: Electrodes are placed in a specific pattern to create the interference pattern within the body. The placement may vary depending on the area being treated and the desired outcome.
- Treatment duration:

The therapeutic effects of interferential current include:

- - Pain relief:
- - Increased blood flow:

- Muscle relaxation:

Strength Duration curve is a graphical representation of the relationship between the strength (intensity) and duration required to elicit a muscle contraction. In a case of a peripheral nerve injury that has started regenerating, the Strength Duration curve can help assess the recovery progress by comparing the excitability threshold and curve shape to the normal values. As the nerve regenerates, the excitability threshold may decrease, and the curve shape may approach normal, indicating functional recovery. The results and prognosis of the Strength Duration curve can guide the treatment planning and rehabilitation process for the patient

13. Types of Peripheral Nerve Injuries:

    1. Neuropraxia:
    2. Axonotmesis:
    3. Neurotmesis:

    Selection of Current for Neuropraxia and Neurotmesis:
    Neuropraxia: For neuropraxia, the selection of current for treatment depends on the stage of injury and individual patient factors. Initially, a low-intensity electrical stimulation may be applied to promote nerve healing and prevent muscle atrophy. As the nerve begins to recover, the intensity of the electrical stimulation may be gradually increased to facilitate nerve regeneration.

    Neurotmesis: In the case of neurotmesis, where there is complete disruption of the nerve, surgical intervention is usually required to repair the nerve. Electrical stimulation may be used post-surgery to aid in nerve regeneration. The selection of current in this case would depend on the surgeon's preference and the specific surgical technique used.

    Factors Affecting Regeneration of Axon:

    1) Age:
    2) Severity of Injury:
    3) Distance to Target:
    4) Timing of Intervention:
    5) Presence of Scar Tissue:.
    6) Inflammatory Response:

7) Rehabilitation and Physical Therapy:
8) Interferential Current (IFC) definition .

Types: IFC can be categorized into two types - pre-modulated and beat frequency.

Indications: IFC is commonly used for pain management, muscle relaxation, edema reduction, and improving blood circulation.

CONTRAINDICATIONS

Physiological Effects: IFC produces several physiological effects, including pain relief through the gate control theory, muscle relaxation through increased blood flow and oxygenation, and increased tissue healing through improved circulation and nutrient delivery.

Dangers: IFC is generally safe when used correctly, but there are some potential dangers. Improper electrode placement, excessive intensity, or prolonged treatment duration can cause skin irritation or burns.

Parameters: The parameters of IFC include frequency, intensity, duration, and electrode placement. Frequency typically ranges from 1-150 Hz, intensity is adjusted based on patient tolerance, and treatment duration can vary from 10-30 minutes.

14. Interrupted Direct Current (IDC) is a type of electrical stimulation therapy that uses direct current (DC) with intermittent interruptions to produce therapeutic and physiological effects.

Therapeutic Effects: IDC can be used for pain management, muscle re-education, muscle strengthening, and tissue healing. It helps to reduce pain through the gate control theory, improves muscle function through stimulation of motor nerves, and promotes tissue healing through increased circulation and nutrient delivery.

Physiological Effects: IDC produces several physiological effects, including pain relief, muscle contraction and relaxation, increased blood flow, improved tissue oxygenation, and enhanced tissue healing.

Uses and Techniques:

15. Transcutaneous Electrical Nerve Stimulation definition

Parameters: TENS parameters include frequency, intensity, pulse width, and electrode placement. TENS units can be set to deliver various frequencies ranging from low (2-4 Hz) to high (80-100 Hz). Intensity is adjusted based on patient tolerance, and pulse width typically ranges from 50-200 microseconds.

Types: TENS can be categorized into conventional TENS, burst TENS, and acupuncture-like TENS.

Physiological Effects: TENS produces several physiological effects, including pain relief through the gate control theory, increased endorphin release, improved blood circulation, and reduced muscle spasms.

16. Biofeedback is a technique that allows individuals to gain awareness and control over their physiological processes by providing real-time feedback about their bodily functions.

Parameters: Biofeedback parameters depend on the specific physiological process being monitored. Common biofeedback parameters include heart rate, blood pressure, muscle tension, skin temperature, and brainwave activity.

Uses: Biofeedback is used in various fields such as stress management, pain management, rehabilitation, and performance enhancement. It can help individuals learn to control their physiological processes, such as reducing muscle tension or regulating heart rate, to improve their overall well-being.

17. The Strength Duration (S.D.) definition

- Diagnosis: The S.D. curve can help diagnose nerve injuries or neuropathies by identifying changes in the excitability threshold. Abnormalities in the curve shape or position can indicate nerve damage or dysfunction.
- Prognosis: By monitoring the changes in the S.D. curve over time, healthcare professionals can assess the progression of nerve regeneration and recovery following an injury or surgical intervention.

Treatment planning: The S.D. curve can guide the selection of appropriate electrical stimulation parameters for nerve rehabilitation, such as determining the optimal intensity and duration of the stimulation.

18. Faradic current is a type of electrical current used in electrical stimulation therapy. It is an alternating current with a frequency of around 50-100 Hz. The surging of Faradic current refers to the rapid rise and fall of the current intensity, creating a pulsating effect.

Therapeutically, Faradic current is commonly used for muscle strengthening, pain relief, and muscle re-education

19. Iontophoresis definition

- Electrodes: Two electrodes, one positive and one negative, are used. The electrode carrying the medication is placed over the treatment area, while the other electrode is placed elsewhere on the body.
- Polarity:
- Current application:
- Skin penetration:

The therapeutic uses of iontophoresis include:

- Localized pain management: Iontophoresis can be used to deliver analgesic medications, such as lidocaine, directly to the affected area for pain relief
- Iontophoresis is a technique used to deliver medication through the skin using a low-level electrical current. The physical principle behind iontophoresis is the movement of ions in an electric field. The ion used in treating idiopathic hyperhidrosis (excessive sweating) is typically glycopyrrolate. In the treatment procedure, the medication is applied to the skin, and a small electrical current is passed through the skin to facilitate the penetration of the medication

20. nterferential therap definition

Frequency sweep in interferential therapy refers to the continuous variation of the frequency of the two currents used. This helps to prevent accommodation and increase the penetration depth. Interferential therapy can be applied using electrodes placed on the skin, and it is commonly used for pain relief, muscle stimulation, and edema reduction.

21. Transcutaneous Electrical Nerve Stimulation definition

There are different types of TENS, including conventional TENS, acupuncture-like TENS, and burst mode TENS.

Parameters for TENS include frequency, pulse duration, and intensity.

Therapeutic effects of TENS include pain relief, muscle relaxation, and improved circulation.

Advantages of TENS include its non-invasive nature and the ability to use it at home.

22. “Smart Bristo coil” or its connection to Faradic current. However, the physiological effects of Faradic current include muscle contraction, increased blood flow, and pain relief.

23. Faradic current is an alternating current commonly used in electrical stimulation therapy. Physiologically, it causes muscle contractions and increases blood flow to the area. Therapeutically, Faradic current is used for muscle strengthening, pain relief, and muscle re-education. Indications for Faradic current include muscle weakness, muscle atrophy, and pain management. Contraindications include pacemakers, metal implants, and pregnancy.

24. Low frequency currents:

    a) Faradic type current: Faradic current is an alternating current with a frequency of around 50 Hz. It is used in muscle stimulation and rehabilitation. It produces muscle contractions and is commonly used for muscle strengthening and pain relief.

    b) Interrupted Galvanic current: Interrupted Galvanic current is a direct current that is interrupted at regular intervals. It is used for various therapeutic purposes such as pain relief, muscle stimulation, and wound healing.

25. Interrupted direct current (IDC) is a form of electrical stimulation commonly used in physiotherapy. It involves the application of a direct current that is interrupted at regular intervals. Indications for IDC include muscle strengthening, pain relief, and muscle re-education. Contraindications may include pacemaker use, pregnancy, and areas of skin irritation or open wounds. The method of application involves placing electrodes on the skin over the targeted area and adjusting the settings to deliver the desired frequency and intensity of the interrupted current.

26. Low frequency currents are commonly used in physiotherapy for various therapeutic purposes. There are different types of low frequency currents, including:

    a) Faradic type current: Faradic current is an alternating current with a frequency of around 50-100 Hz. It is used for muscle stimulation and can help with muscle strengthening, pain relief, and muscle re-education. It is commonly applied using pads or electrodes placed on the skin over the targeted muscles.

    b) Interrupted Galvanic current: Interrupted Galvanic current is a direct current that is interrupted at regular intervals. It is used for pain relief and muscle stimulation. It can be applied using electrodes or pads placed on the skin over the targeted area, and the settings can be adjusted to deliver the desired frequency and intensity of the interrupted current.

27. Peripheral Nerve Injuries: Peripheral nerve injuries refer to damage or dysfunction of the nerves outside the brain and spinal cord. Common causes include trauma, compression, or disease. Physiotherapy management for radial nerve injury may include exercises to improve muscle strength and coordination, sensory re-education, and pain management techniques.

28. Ultra violet radiation: Ultraviolet (UV) radiation is a type of electromagnetic radiation with a wavelength shorter than visible light. It is commonly used for various therapeutic purposes, such as treating skin conditions and promoting vitamin D synthesis. UV radiation can be generated using different types of generators, including mercury vapor lamps and fluorescent tubes.

29. Ultrasound: Ultrasound refers to sound waves with frequencies higher than the upper audible limit of human hearing. ultrasound is used for therapeutic purposes such as tissue heating, promoting tissue healing, and reducing pain and inflammation. Treatment parameters for ultrasound include frequency, intensity, duration, and mode of application.

30. Non-luminous and luminous generators of IRR: IRR stands for Infrared Radiation. Non-luminous generators of IRR include sources like electrically heated metal filaments or ceramic elements. Luminous generators of IRR include sources like incandescent lamps or infrared emitting diodes (LEDs). Therapeutic effects of IRR include pain relief, muscle relaxation, and promoting tissue healing.

31. Cryotherapy: Cryotherapy refers to the therapeutic use of cold temperatures. It is commonly used for reducing pain, inflammation, and swelling. Methods of application include ice packs, cold compresses, and cold baths. Therapeutic effects of cryotherapy include vasoconstriction, reduced nerve conduction velocity, and decreased metabolic rate.

32. Short wave Diathermy: Short wave diathermy is a form of deep heating therapy that uses high-frequency electromagnetic waves. It is used for various conditions such as muscle relaxation, pain relief, and tissue healing. Construction of short wave diathermy machines involves a high-frequency generator and an applicator. Methods of application include capacitive and inductive methods. Physiological and therapeutic effects include increased blood flow, improved tissue extensibility, and pain relief.

33. Oscillation: Oscillation refers to the repetitive back-and-forth motion of a system. Capacitance and inductance are properties of electrical circuits. An example of an oscillating system is a pendulum swinging back and forth. Energy transfer between two circuits can take place through electromagnetic induction. Nodes are points in a standing wave where the amplitude is zero, while antinodes are points of maximum amplitude.

34. Mechanism of Ultrasound production: Ultrasound is produced through the piezoelectric effect, where an alternating current applied to a piezoelectric crystal generates sound waves. Ultrasound can be applied for different conditions using various techniques, such as continuous ultrasound or pulsed ultrasound. Therapeutic parameters include frequency, intensity, duration, and mode of application.

35. Production of Infrared radiation: Infrared radiation is produced by sources that emit heat, such as incandescent lamps or infrared emitting diodes (LEDs). Application methods for infrared radiation include infrared lamps, infrared saunas, or infrared wraps. Precautions during treatment include avoiding excessive heat exposure and protecting sensitive areas of the body.

36. Physical effects of heat and laws governing radiations: Heat can produce various physiological effects, including increased blood flow, increased metabolic rate, tissue relaxation, and pain relief. The laws governing radiations include the inverse square law, which states that the intensity of radiation decreases with the square of the distance from the source, and the Stefan-Boltzmann law, which relates the temperature of a radiating body to the amount of energy it emits.

37. Properties of laser: Laser stands for Light Amplification by Stimulated Emission of Radiation. Laser light is monochromatic (single wavelength), coherent (in phase), and highly directional. Low level laser therapy (LLLT) uses low power lasers for therapeutic purposes such as pain relief, tissue healing, and reducing inflammation. Physical and therapeutic effects of laser include increased cellular activity, improved tissue repair, and pain reduction.

38. Laser properties: A laser is a device that emits a coherent beam of light through the process of stimulated emission. It has several properties that make it unique:

    - Monochromatic: Laser light is of a single wavelength, which allows for precise targeting of specific tissues.

- Coherent: Laser light is in phase, meaning the waves are aligned, resulting in a concentrated beam that can be focused on a small area.
- Collimated: Laser light is highly directional and does not diverge significantly, allowing for accurate delivery to the target area.
- High intensity: Laser light is highly concentrated, providing a high energy output. Principles of application of low-level laser: Low-level laser therapy (LLLT) is the use of laser light at low power levels to stimulate biological processes. It works through photobiomodulation, where the light energy is absorbed by cells and triggers various cellular responses. LLLT can be applied using different techniques, such as direct contact or scanning, depending on the desired effect and target tissue. Physical and therapeutic effects of laser: Laser therapy has various physical and therapeutic effects, including:
- Pain relief: Laser light can stimulate the release of endorphins and reduce pain signals.
- Wound healing: Laser therapy can enhance cellular metabolism, promote tissue repair, and improve collagen synthesis.
- Musculoskeletal conditions: Laser therapy can reduce inflammation, increase blood flow, and promote tissue regeneration in musculoskeletal injuries.

39. Production of microwave diathermy: Microwave diathermy is produced using a magnetron, which generates microwaves through the interaction of electrons and a magnetic field. The microwaves are then directed towards the treatment area.

    Technique of application: Microwave diathermy is applied using a specialized applicator that emits the microwaves. The applicator is moved in a circular or sweeping motion over the target area, maintaining a safe distance from the patient's skin.

    Dangers: Microwave diathermy should be used with caution due to the potential risks of excessive heating and burns. Precautions should be taken to ensure proper patient positioning and monitoring of temperature.

40. Ultraviolet radiation (UVR) indications: Ultraviolet radiation is used in various therapeutic applications, such as:

    - Treatment of skin conditions like psoriasis, eczema, and vitiligo.
    - Phototherapy for jaundice in newborns.
    - Sterilization of air, water, and surfaces.

Contraindications: Ultraviolet radiation should be avoided or used with caution in certain cases, such as:

- Photosensitivity disorders.
- Active infections or open wounds.
- Pregnancy.
- History of skin cancer.
- Eye conditions or medications that increase sensitivity to light.

Dangers: Overexposure to ultraviolet radiation can cause sunburn, skin damage, and increase the risk of skin cancer. Protective measures, such as goggles and sunscreen, should be used during treatment.

41. Moist heat: Moist heat therapy involves the application of heat with the use of a moist medium, such as hydrocollator packs.

Apparatus: Hydrocollator packs are cloth bags filled with a gel-like substance that can retain heat. They are heated in a hydrocollator unit, which is a thermostatically controlled water bath.

Technique of application: The hydrocollator packs are heated in the hydrocollator unit and then applied to the target area, wrapped in towels or a cover. The packs should be checked for temperature and adjusted as needed to maintain a comfortable level of heat.

Indications: Moist heat therapy is commonly used for conditions like muscle strains, joint stiffness, and pain relief.

Contraindications: Moist heat therapy should be avoided or used with caution in cases of acute inflammation, open wounds, and certain skin conditions.

Advantages: Moist heat therapy can provide deeper penetration of heat, increased blood flow, muscle relaxation, and pain relief.

42. Technique of application of laser: Laser therapy is applied using a handheld device that emits the laser beam. The device is placed directly on the skin or held a short distance away, depending on the desired effect and target tissue. The laser is moved in a slow and controlled manner over the treatment area, ensuring proper coverage.

Effects in pain relief: Laser therapy can help reduce pain by stimulating the release of endorphins, reducing inflammation, and improving blood flow to the affected area.

Effects in wound healing: Laser therapy can accelerate wound healing by promoting cellular metabolism, increasing collagen synthesis, and enhancing tissue regeneration.

Effects in musculoskeletal conditions: Laser therapy can reduce inflammation, relieve muscle spasms, improve range of motion, and promote tissue repair in musculoskeletal injuries.

43. Heat definition: Heat is a form of energy that is transferred from one object to another due to a temperature difference. It can be transmitted through conduction, convection, or radiation.

    Physical effects: Heat can cause vasodilation, increased blood flow, increased cellular metabolism, muscle relaxation, and pain relief.

    Transmission of heat: Heat can be transmitted through direct contact (conduction), such as with hot packs or paraffin wax baths, or through the movement of heated air or water (convection).

    Liquid paraffin wax bath: A liquid paraffin wax bath is a type of heat therapy where the affected body part is immersed in a bath of liquid paraffin wax. The wax is heated to a specific temperature and the body part is submerged for a certain duration.

    Apparatus: A liquid paraffin wax bath consists of a container filled with liquid paraffin wax, which is heated by an electric heater or thermostatically controlled heating element.

    Indications: Liquid paraffin wax baths are commonly used for conditions like arthritis, joint stiffness, and chronic pain.

    Contraindications: Liquid paraffin wax baths should be avoided or used with caution in cases of open wounds, acute inflammation, and certain skin conditions.

44. Production of infrared radiation (IRR): Infrared radiation is produced using infrared generators, which can be non-luminous or luminous.

    Non-luminous generators: Non-luminous generators produce infrared radiation through the heating of a filament or element, such as in infrared lamps or ceramic heaters.

    Luminous generators: Luminous generators produce infrared radiation through the combustion or heating of a fuel source, such as in gas-fired infrared heaters.

Techniques of treatment: Infrared radiation can be applied using various techniques, such as direct contact with the skin, focused or scanned application, or through the use of infrared saunas or heat lamps.

45. Physiological effects of ultrasound therapy: Ultrasound therapy can produce various physiological effects, including:

- Increased tissue temperature: Ultrasound waves can generate heat in the tissues, leading to increased blood flow and metabolism.
- Increased cellular activity: Ultrasound can stimulate cellular activity and promote tissue repair.
- Increased collagen synthesis: Ultrasound can enhance the production of collagen, which is important for tissue healing and regeneration.

Techniques of application: Ultrasound therapy is applied using a handheld transducer that emits high-frequency sound waves. The transducer is moved in a slow and controlled manner over the treatment area, ensuring proper coverage.

Contraindications: Ultrasound therapy should be avoided or used with caution in cases of acute inflammation, open wounds, fractures, and certain medical conditions, such as cancer or pregnancy.

46. Oscillatory current definition: Oscillatory current is a type of electrical current that oscillates between positive and negative values, creating a continuous alternating current.

Production: Oscillatory current can be produced using specialized devices, such as shortwave diathermy machines, which generate high-frequency oscillations in the radiofrequency range.

Physiological effects: Oscillatory current can produce various physiological effects, including:

- Increased tissue temperature: Oscillatory current can generate heat in the tissues, leading to increased blood flow and metabolism.
- Increased cellular activity: Oscillatory current can stimulate cellular activity and promote tissue repair.
- Muscle relaxation: Oscillatory current can help relax muscles and relieve muscle spasms.

Therapeutic effects: Oscillatory current is commonly used for pain relief, muscle relaxation, tissue healing, and rehabilitation in various musculoskeletal conditions.

47. Microwave diathermy definition: Microwave diathermy is a type of deep heating modality that uses high-frequency electromagnetic waves to generate heat within the body tissues.

    Indication: Microwave diathermy is commonly used for conditions like muscle strains, joint stiffness, and pain relief.

    Contraindication: Microwave diathermy should be avoided or used with caution in cases of acute inflammation, open wounds, fractures, and certain medical conditions, such as cancer or pregnancy.

    Production: Microwave diathermy is produced using a magnetron, which generates microwaves through the interaction of electrons and a magnetic field. The microwaves are then directed towards the treatment area.

    Physiological effects: Microwave diathermy can produce various physiological effects, including increased tissue temperature, increased blood flow, increased cellular metabolism, and muscle relaxation.

    Therapeutic effects: Microwave diathermy is commonly used for pain relief, muscle relaxation, tissue healing, and rehabilitation in various musculoskeletal conditions.

    Danger: Microwave diathermy should be used with caution due to the potential risks of excessive heating and burns. Precautions should be taken to ensure proper patient positioning and monitoring of temperature.

48. Methods of shortwave diathermy (SWD) application: SWD can be applied using various methods, including:

    - Capacitive method: The patient is placed between two electrodes, one acting as an applicator and the other as a dispersing electrode. The SWD is applied through the applicator electrode, creating an electric field that penetrates the tissues.
    - Inductive method: The patient is placed near a coil or drum electrode that generates a magnetic field. The SWD is applied through the magnetic field, inducing electrical currents within the tissues.

The specific method of SWD application depends on the desired effect and target tissue. The treatment parameters, such as intensity, frequency, and duration, are adjusted based on the patient's condition and response.

49. Production of laser: Laser light is produced through a process called stimulated emission. It involves the excitation of atoms or molecules to a higher energy state, followed by the release of photons as the atoms or molecules return to their ground state. This process is amplified and focused within a laser cavity, resulting in a coherent and concentrated beam of light.

    Therapeutic effects of laser: Laser therapy can provide various therapeutic effects, including:

    - Pain relief: Laser light can stimulate the release of endorphins and reduce pain signals.
    - Wound healing: Laser therapy can enhance cellular metabolism, promote tissue repair, and improve collagen synthesis.
    - Musculoskeletal conditions: Laser therapy can reduce inflammation, increase blood flow, and promote tissue regeneration in musculoskeletal injuries.

50. Non-luminous and luminous generators of infrared radiation (IRR):

    - Non-luminous generators: Non-luminous generators produce infrared radiation through the heating of a filament or element, such as in infrared lamps or ceramic heaters.
    - Luminous generators: Luminous generators produce infrared radiation through the combustion or heating of a fuel source, such as in gas-fired infrared heaters.

    Therapeutic and physiological effects of IRR: Infrared radiation can produce various therapeutic and physiological effects, including:

    - Increased tissue temperature: IRR can generate heat in the tissues, leading to increased blood flow and metabolism.
    - Increased cellular activity: IRR can stimulate cellular activity and promote tissue repair.
    - Muscle relaxation: IRR can help relax muscles and relieve muscle spasms.

51. Production of ultrasound: Ultrasound is produced using a piezoelectric crystal or ceramic transducer. When an electrical current is applied to the transducer, it vibrates at

a high frequency, generating sound waves in the ultrasonic range. These sound waves can then be focused and directed towards the treatment area.

Parameters of ultrasound: The parameters of ultrasound therapy can be adjusted based on the desired effect and target tissue. These parameters include frequency (typically between 1 and 3 MHz), intensity (measured in watts per square centimeter), and treatment duration.

Different conditions may require specific parameter settings to achieve optimal therapeutic effects. For example, higher frequencies are often used for superficial tissues, while lower frequencies penetrate deeper into the tissues.

52. Production of ultraviolet rays: Ultraviolet rays are produced using specialized generators, such as fluorescent lamps or mercury vapor lamps, that emit light in the ultraviolet range.

    Principles of application of treatment: Ultraviolet radiation therapy involves the exposure of the skin or target area to controlled amounts of ultraviolet rays. The treatment can be administered using specific wavelengths (UVA, UVB, UVC) depending on the condition being treated.

    Therapeutic effects: Ultraviolet radiation therapy can provide various therapeutic effects, including:

    - Anti-inflammatory effects: UV radiation can help reduce inflammation in conditions like psoriasis and eczema.
    - Vitamin D synthesis: UV radiation can stimulate the production of vitamin D in the skin.
    - Phototherapy for jaundice: UV radiation can break down bilirubin in the blood, helping to treat jaundice in newborns.

53. Superficial heating modalities for patients with low backache: Superficial heating modalities, such as hot packs or paraffin wax baths, can be used for patients with low backache to provide pain relief, muscle relaxation, and increased blood flow to the affected area. These modalities should be applied with caution, considering the patient's comfort and any contraindications.

54. Production and construction of SWD: SWD is produced using a shortwave diathermy machine, which consists of a high-frequency oscillator, a power supply, and applicators

or electrodes for treatment. The machine generates high-frequency oscillations in the radiofrequency range, which are then applied to the patient's tissues through the electrodes.

Dangers: SWD should be used with caution due to the potential risks of excessive heating and burns. Precautions should be taken to ensure proper patient positioning and monitoring of temperature. The machine should be properly maintained and checked for safety.

55. Principles of application of wax bath for rheumatoid arthritis: Wax bath therapy involves immersing the affected body part in a bath of melted paraffin wax, which is heated to a specific temperature. The wax bath provides heat therapy, pain relief, and muscle relaxation for patients with rheumatoid arthritis.

    Home program: A home program for wax bath therapy may involve the use of a portable wax bath unit, which can be safely used at home under the guidance of a healthcare professional. The patient should follow specific instructions for temperature, duration, and precautions to ensure safe and effective treatment.

56. Ultraviolet radiation (UVR) definition: Ultraviolet radiation is a type of electromagnetic radiation with wavelengths shorter than visible light. It is classified into three types based on wavelength: UVA, UVB, and UVC.

    Types of generators: Ultraviolet radiation can be generated using various devices, such as fluorescent lamps, mercury vapor lamps, or specialized UV lamps. These generators emit specific wavelengths of UV radiation depending on the intended use.

    Production: Ultraviolet radiation is produced through the excitation of atoms or molecules in the generator, which results in the emission of photons in the UV range.

57. Production and construction of SWD: SWD is produced using a shortwave diathermy machine, which consists of a high-frequency oscillator, a power supply, and applicators or electrodes for treatment. The machine generates high-frequency oscillations in the radiofrequency range, which are then applied to the patient's tissues through the electrodes.

    Dangers: SWD should be used with caution due to the potential risks of excessive heating and burns. Precautions should be taken to ensure proper patient positioning and

monitoring of temperature. The machine should be properly maintained and checked for safety.

SHORT ESSAY

1. Laws of reflection and refraction: The laws of reflection state that the angle of incidence is equal to the angle of reflection, and the incident ray, reflected ray, and normal all lie in the same plane. The laws of refraction state that the incident ray, refracted ray, and normal all lie in the same plane, and the ratio of the sine of the angle of incidence to the sine of the angle of refraction is constant for a given pair of media.
2. PUVA therapy: PUVA therapy is a form of phototherapy used to treat various skin conditions, such as psoriasis, vitiligo, and eczema. It involves the administration of a drug called psoralen, followed by exposure to ultraviolet A (UVA) light. The combination of psoralen and UVA light helps to slow down the excessive growth of skin cells and reduce inflammation.
3. Reverse piezoelectric effect: The piezoelectric effect is the generation of an electric charge in certain materials when subjected to mechanical stress. The reverse piezoelectric effect is the generation of mechanical stress or strain in a material when subjected to an electric field. This effect is commonly used in devices like piezoelectric transducers and actuators.
4. Contrast bath: Contrast bath is a therapeutic technique used in physical therapy to promote circulation and reduce inflammation. It involves alternating immersion of a body part in warm water and cold water. The contrast between warm and cold temperatures causes blood vessels to dilate and constrict, which helps to improve blood flow and reduce swelling.
5. Kromayer lamp: A Kromayer lamp is a medical device used in dermatology for the treatment of skin conditions, such as acne and psoriasis. It emits a specific wavelength of ultraviolet light that is beneficial for the skin. The lamp is designed to deliver controlled doses of UV light to targeted areas of the skin.
6. Cable method of Short wave diathermy: The cable method of shortwave diathermy is a technique used to deliver high-frequency electromagnetic waves for therapeutic purposes. It involves the use of cables to transmit the electromagnetic energy to the

patient's body. Shortwave diathermy is commonly used in physical therapy to provide deep heating to tissues and promote healing.

7. Microwave Diathermy: Microwave diathermy is a therapeutic technique that uses microwave energy to generate heat deep within the body tissues. It is commonly used in physical therapy to treat conditions such as muscle spasms, joint stiffness, and pain. The microwave energy is delivered through a specialized applicator that is placed on the patient's skin.

8. Lewis hunting reaction: The Lewis hunting reaction is a phenomenon observed in the skin when exposed to ultraviolet radiation. It refers to the appearance of a dark pigment called melanin in response to UV exposure. This reaction is a protective mechanism of the skin against further UV damage and is responsible for the tanning effect.

9. Physiological effects of heat: Heat therapy has various physiological effects on the body. It increases blood flow to the treated area, which helps to deliver oxygen and nutrients to the tissues and remove waste products. Heat also promotes muscle relaxation, reduces pain and muscle spasms, and increases the flexibility of tissues. Additionally, heat therapy can help to stimulate the healing process and reduce inflammation.

10. Laser: A laser is a device that emits a focused beam of light with a specific wavelength and intensity. It has various applications in medicine, including surgical procedures, treatments for skin conditions, and pain management. Laser therapy works by delivering concentrated energy to targeted tissues, which can be used for cutting, cauterizing, or stimulating cellular processes.

11. Construction and principles of Ultrasound: Ultrasound is a medical imaging technique that uses high-frequency sound waves to create images of internal body structures. The ultrasound machine consists of a transducer, which emits and receives the sound waves, and a computer system that processes the signals and generates the images. The principles of ultrasound involve the reflection, absorption, and transmission of sound waves through different tissues, which allows for the visualization of organs, blood flow, and abnormalities.

12. Hydro collator packs: Hydro collator packs are moist heat packs used in physical therapy to provide localized heat therapy to specific areas of the body. They consist of fabric-covered packs filled with a gel-like substance that can be heated in a hydro

collator unit. When applied to the body, the packs transfer heat to the tissues, promoting relaxation, pain relief, and increased blood flow.

13. Dosage in ultraviolet rays: The dosage in ultraviolet rays refers to the amount of UV radiation received by the skin during a treatment session. It is measured in joules per square centimeter (J/cm^2) and is determined based on factors such as the patient's skin type, the condition being treated, and the desired therapeutic effect. The dosage must be carefully controlled to ensure the safety and effectiveness of UV therapy.

14. Techniques of cryotherapy: Cryotherapy refers to the therapeutic use of cold temperatures to treat various conditions. Techniques of cryotherapy include ice packs, ice massage, cold baths, and cryogenic sprays. These techniques help to reduce pain, inflammation, and swelling, and promote the healing process.

15. Microwave diathermy: Microwave diathermy is a therapeutic technique that uses microwave energy to generate heat deep within the body tissues. It is commonly used in physical therapy to treat conditions such as muscle spasms, joint stiffness, and pain. The microwave energy is delivered through a specialized applicator that is placed on the patient's skin.

16. Biological changes due to cryotherapy: Cryotherapy induces various biological changes in the body. The cold temperatures cause blood vessels to constrict, reducing blood flow to the treated area. This helps to reduce inflammation and swelling. Cryotherapy also slows down nerve conduction, numbing the area and reducing pain. Additionally, the cold temperatures can stimulate the release of endorphins, which are natural pain-relieving substances.

17. Indications and contraindications of Shortwave diathermy: Shortwave diathermy is indicated for conditions such as muscle strains, joint stiffness, arthritis, and chronic pain. It helps to promote tissue healing, reduce pain, and increase range of motion. However, there are certain contraindications to shortwave diathermy, such as pregnancy, metal implants, pacemakers, and active infections. It is important to assess the patient's medical history and condition before using this modality.

18. Transmission of Ultrasound by various coupling media: Ultrasound waves require a coupling medium to transmit from the transducer to the patient's skin. Common coupling media include gel, oil, water, and specialized ultrasound creams. The choice of coupling medium depends on factors such as the type of ultrasound examination, the

depth of the target structure, and the patient's skin condition. The coupling medium helps to eliminate air gaps between the transducer and the skin, ensuring efficient transmission of sound waves.

19. Mercury vapor lamp: A mercury vapor lamp is a type of gas discharge lamp that produces light by passing an electric current through mercury vapor. It emits ultraviolet (UV) light, which can be used for various applications, including UV therapy, sterilization, and industrial processes.

20. Photosensitization: Photosensitization refers to the increased sensitivity of the skin to sunlight or other sources of ultraviolet (UV) radiation. It can be caused by certain medications, chemicals, or medical conditions. Photosensitization can lead to skin reactions, such as rashes, redness, and blistering, when exposed to UV light.

21. Hubbard tank: A Hubbard tank is a specialized therapy pool used in physical therapy for the treatment of various musculoskeletal and neurological conditions. It is a large tank filled with warm water, and patients can be fully immersed in the water to perform exercises and receive hydrotherapy treatments. The buoyancy of the water helps to reduce weight-bearing on the joints, promote relaxation, and improve mobility.

22. Uses and contraindications of cryotherapy: Cryotherapy is used for various purposes, such as reducing pain and inflammation, promoting healing, and treating certain skin conditions. It is commonly used in physical therapy, sports medicine, and dermatology. However, there are contraindications to cryotherapy, such as cold intolerance, Raynaud's disease, and certain circulatory disorders. It is important to assess the patient's medical history and condition before using cryotherapy.

23. Electromagnetic induction: Electromagnetic induction is the process of generating an electric current in a conductor by varying the magnetic field around it. It is the underlying principle behind the functioning of devices such as transformers, generators, and induction heaters. Electromagnetic induction is based on Faraday's law, which states that a changing magnetic field induces an electromotive force (EMF) in a conductor.

24. Techniques of application in phonophoresis: Phonophoresis is a technique used to enhance the absorption of topical medications into the deeper layers of the skin using ultrasound waves. The medication is applied to the skin and then ultrasound waves are

applied to the area using a transducer. The ultrasound waves help to increase the permeability of the skin, allowing for better absorption of the medication.

25. Electrode placement in Condenser field method in shortwave diathermy: The condenser field method is a technique used in shortwave diathermy to provide deep heating to tissues. Electrodes are placed on the patient's body in a specific configuration to create a condenser field, which allows for the efficient transmission of electromagnetic waves. The electrode placement depends on the area being treated and the desired therapeutic effect. It is important to follow proper electrode placement guidelines to ensure effective and safe treatment.

26. Physiological effect and therapeutic effect of ultraviolet radiation:

    Physiological effects of ultraviolet radiation include erythema (redness of the skin), tanning, vitamin D synthesis, and immunosuppression. Therapeutic effects include treatment of skin conditions such as psoriasis, eczema, and vitiligo, as well as phototherapy for certain types of cancer.

27. Whirlpool bath:

    A whirlpool bath is a therapeutic modality that involves immersing a body part or the entire body in a tub of warm water that is agitated by jets or whirlpool action. It is commonly used for wound care, pain management, and muscle relaxation.

28. Dangers with infrared radiations:

    Infrared radiation can cause burns and tissue damage if not used properly. Prolonged exposure to high levels of infrared radiation can also lead to eye damage. It is important to follow safety guidelines and use appropriate protective measures when using infrared radiation.

29. Biological effects of pulsed shortwave diathermy:

    Pulsed shortwave diathermy is a modality that uses high-frequency electromagnetic waves to generate deep heat in tissues. Its biological effects include increased blood flow, relaxation of muscles, reduction of pain and inflammation, and promotion of tissue healing.

30. Dip method in paraffin wax application:

The dip method in paraffin wax application involves dipping a body part, such as a hand or foot, into a warm mixture of paraffin wax and mineral oil. This therapy is commonly used for pain relief, joint stiffness, and arthritis.

31. Cold spray:

    Cold spray, also known as cryotherapy spray, is a therapeutic modality that involves spraying a cold substance, typically a refrigerant, on a specific area of the body to reduce pain, inflammation, and swelling. It is commonly used in sports medicine and rehabilitation.

32. PUVA regimen:

    PUVA stands for Psoralen plus Ultraviolet A radiation. It is a treatment regimen used for certain skin conditions, such as psoriasis and vitiligo. The regimen involves the use of a photosensitizing medication (psoralen) followed by exposure to UVA radiation.

33. Contrast bath:

    A contrast bath is a therapeutic technique that involves alternating immersions of a body part in warm and cold water. It is commonly used for pain management, reduction of swelling, and promotion of circulation.

34. Phonophoresis:

    Phonophoresis is a therapeutic technique that involves the application of ultrasound waves to enhance the delivery of topical medications into the tissues. It is commonly used for pain relief and reduction of inflammation.

35. Physiological effects of cryotherapy:

    Cryotherapy, or cold therapy, has various physiological effects including vasoconstriction (narrowing of blood vessels), reduction of pain and inflammation, decreased metabolism, and numbing of nerves. It is commonly used for acute injuries, post-surgical recovery, and pain management.

36. Production of ultrasound:

    Ultrasound is produced by a transducer that converts electrical energy into mechanical vibrations. These vibrations are then transmitted into the body through a coupling medium, such as gel, and create sound waves that penetrate tissues and produce therapeutic effects.

37. Paraffin wax bath:

A paraffin wax bath is a therapeutic modality that involves immersing a body part, typically the hands or feet, into a warm mixture of paraffin wax and mineral oil. It is commonly used for pain relief, joint stiffness, and arthritis.

38. Therapeutic uses of infrared radiation:

Infrared radiation is used therapeutically for various purposes, including pain relief, muscle relaxation, promotion of blood flow, and wound healing. It is commonly used in physiotherapy and rehabilitation.

39. Electrode positioning in capacitor field method:

In the capacitor field method, electrodes are positioned on the patient's body to create an electric field that penetrates tissues. The specific positioning of the electrodes depends on the desired therapeutic effect and the area being treated.

40. Physical effects and transmission of heat:

Heat can be transmitted through conduction (direct contact), convection (movement of heated fluid), radiation (emission of electromagnetic waves), or conversion (energy conversion within the body). The physical effects of heat include increased blood flow, relaxation of muscles, pain relief, and promotion of tissue healing.

41. Contrast bath:

A contrast bath is a therapeutic technique that involves alternating immersions of a body part in warm and cold water. It is commonly used for pain management, reduction of swelling, and promotion of circulation.

42. Therapeutic Effects of ultrasound:

Ultrasound therapy has various therapeutic effects, including increased blood flow, relaxation of muscles, reduction of pain and inflammation, promotion of tissue healing, and facilitation of tissue repair. It is commonly used in physiotherapy and rehabilitation.

43. Properties and technique of LASER:

LASER stands for Light Amplification by Stimulated Emission of Radiation. It is a therapeutic modality that uses focused beams of light to generate specific wavelengths and energies. The properties of LASER include coherence, monochromaticity, and

collimation. The technique involves proper positioning of the LASER device and appropriate safety measures to ensure effective and safe treatment.

44. Pulsed shortwave diathermy:

    Pulsed shortwave diathermy is a modality that uses high-frequency electromagnetic waves to generate deep heat in tissues. It is commonly used for pain relief, reduction of inflammation, relaxation of muscles, and promotion of tissue healing.

45. Hubbard tank:

    A Hubbard tank is a large, therapeutic pool that is used for full-body immersion in water. It is commonly used in rehabilitation settings for patients with burns, wounds, or mobility impairments. The tank allows for buoyancy and easy movement in water, facilitating therapy and exercise.

46. Physiological effects of UVR:

    UVR, or ultraviolet radiation, has various physiological effects including erythema (redness of the skin), tanning, vitamin D synthesis, and immunosuppression. These effects can be both beneficial and harmful, depending on the dose and duration of exposure.

47. Generators of IRR:

    IRR, or infrared radiation, can be generated by various devices such as lamps, heaters, lasers, and specialized equipment designed for therapeutic use. These generators emit specific wavelengths and energies of infrared radiation for therapeutic purposes.

48. Electromagnetic spectrum:

    The electromagnetic spectrum is the range of all possible frequencies of electromagnetic radiation, which includes radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X-rays, and gamma rays. Each part of the spectrum has different properties and applications.

49. Modality of treatment and dosage for psoriasis:

    The modality of treatment and dosage for psoriasis depends on the severity and location of the condition. Common modalities include topical medications, phototherapy (such as PUVA or narrowband UVB), systemic medications, and biologic therapies. The

dosage and duration of treatment are determined by the healthcare provider based on individual needs.

50. Therapeutic effects of short wave diathermy:

    Short wave diathermy is a modality that uses high-frequency electromagnetic waves to generate deep heat in tissues. Its therapeutic effects include increased blood flow, relaxation of muscles, reduction of pain and inflammation, and promotion of tissue healing. It is commonly used in physiotherapy and rehabilitation.

51. Techniques of application of ultrasound:

    Ultrasound can be applied using various techniques, including direct contact with the skin (transcutaneous), immersion in water (underwater), or through a coupling medium such as gel. The specific technique depends on the area being treated and the desired therapeutic effect.

52. Physiological effects of ultraviolet radiation:

    Physiological effects of ultraviolet radiation include erythema (redness of the skin), tanning, vitamin D synthesis, and immunosuppression. These effects can be both beneficial and harmful, depending on the dose and duration of exposure.

53. Dangers and contraindications for cryotherapy:

    Cryotherapy, or cold therapy, can have potential dangers and contraindications. These include frostbite, nerve damage, decreased blood flow, cold intolerance, and hypersensitivity reactions. It is important to assess for any contraindications and use cryotherapy safely and appropriately.

54. Luminous generators:

    Luminous generators, also known as light therapy devices, are used to deliver specific wavelengths of light for therapeutic purposes. They can include devices such as LED light panels, laser devices, or specialized lamps. These generators emit light at specific wavelengths to target various conditions and promote healing.

55. Contrast bath: Contrast bath is a therapeutic technique that involves alternating hot and cold water immersions or compresses. It is used to promote circulation, reduce pain and inflammation, and facilitate healing in conditions such as sprains, strains, and joint stiffness.

56. Production of microwave diathermy: Microwave diathermy is produced by an electronic device called a microwave generator. This generator produces high-frequency electromagnetic waves that penetrate deep into the tissues. The waves are then absorbed by the tissues, causing them to heat up and increase blood flow, promoting healing and pain relief.

57. Excitatory cold: Excitatory cold refers to the application of cold therapy, such as ice packs or cold compresses, to stimulate nerve endings and increase sensory input. This can help reduce pain, inflammation, and muscle spasms.

58. Kromayer lamp: A Kromayer lamp is a type of light therapy device that emits a specific wavelength of light, usually ultraviolet (UV) light. It is used in the treatment of skin conditions like psoriasis and vitiligo.

59. Whirlpool bath: A whirlpool bath is a therapeutic technique that involves immersing the body in a tub of warm water with jets or currents. This technique promotes relaxation, improves circulation, and aids in the healing of soft tissue injuries.

60. Heat transmission: Heat transmission refers to the transfer of heat energy from one object or substance to another. It can occur through conduction, convection, or radiation.

61. Laser and its properties: Laser stands for Light Amplification by Stimulated Emission of Radiation. It is a device that emits a narrow, intense beam of light with specific properties such as coherence (all waves are in phase), monochromaticity (single wavelength), and directionality (beam travels in a straight line). Lasers are used in various medical and therapeutic applications, including wound healing, pain management, and tissue regeneration.

62. Indications and contraindications of ultraviolet radiations: Ultraviolet radiation (UVR) therapy is used to treat certain skin conditions like psoriasis, eczema, and vitiligo. Indications for UVR therapy include these skin conditions, while contraindications include pregnancy, certain medications, photosensitivity disorders, and skin cancer.

63. Ultrasound – thermal and non-thermal effects: Ultrasound therapy uses high-frequency sound waves to generate thermal and non-thermal effects in tissues. Thermal effects include increased blood flow, tissue heating, and increased tissue extensibility. Non-thermal effects include cavitation (formation of gas bubbles), microstreaming (fluid movement), and acoustic streaming (movement of particles).

64. Difference between nonluminous and luminous generators of infrared radiation (IRR): Nonluminous generators of IRR, such as infrared lamps, emit infrared radiation without producing visible light. Luminous generators, such as incandescent bulbs, emit both infrared radiation and visible light.

65. Hydrocollator pack: A hydrocollator pack is a therapeutic modality that involves heating cloth-covered gel packs in a hydrocollator unit. These packs are then applied to the body to provide moist heat therapy, promoting muscle relaxation and pain relief.

66. Transmission of heat: Heat can be transmitted through conduction (direct contact), convection (movement of heated particles in a fluid), and radiation (transfer through electromagnetic waves).

67. UVR for skin wounds: Ultraviolet radiation (UVR) can be used to treat certain types of skin wounds, such as chronic ulcers or non-healing wounds. UVR promotes wound healing by increasing blood flow, reducing inflammation, and stimulating tissue regeneration.

68. Contraindications of cryotherapy: Cryotherapy, which involves the application of cold therapy, has several contraindications. These include cold hypersensitivity, Raynaud's disease, cold urticaria, open wounds, and circulatory disorders.

69. Physical properties of LASER: LASER (Light Amplification by Stimulated Emission of Radiation) has specific physical properties, including coherence (waves are in phase), monochromaticity (single wavelength), and directionality (beam travels in a straight line). These properties allow lasers to deliver precise and targeted energy to tissues.

70. Dangers of microwave diathermy (MWD): Microwave diathermy can have potential dangers if used improperly. These include burns, tissue damage, interference with electronic devices, and adverse effects on certain medical conditions or implanted devices.

71. Therapeutic uses of short wave diathermy (SWD): Short wave diathermy is a therapeutic modality that uses high-frequency electromagnetic waves to generate heat in tissues. It is commonly used for pain relief, muscle relaxation, and promoting tissue healing in conditions such as arthritis, sprains, and strains.

72. Techniques of application of SWD: The techniques of applying short wave diathermy include direct application, where the treatment area is in direct contact with the applicator; capacitive method, where the patient holds an electrode while the applicator is placed nearby; and inductive method, where the patient is positioned between two electrodes.

73. Techniques of application of ultrasound therapy: Ultrasound therapy can be applied using different techniques, including continuous mode (continuous delivery of ultrasound waves) and pulsed mode (intermittent delivery of ultrasound waves). The therapist may also use different techniques of movement, such as circular or linear, depending on the treatment goals.

74. Couplants and their uses: Couplants are substances used to facilitate the transmission of ultrasound waves from the ultrasound machine to the patient's skin. Gel, oil, or water-based couplants are commonly used to reduce friction and enhance the effectiveness of ultrasound therapy.

75. Construction and working of MWD: Microwave diathermy (MWD) machines consist of a microwave generator, a waveguide, and an applicator. The microwave generator produces high-frequency electromagnetic waves, which are then guided through the waveguide and delivered to the patient's tissues via the applicator. The waves are absorbed by the tissues, generating heat and promoting therapeutic effects.

76. Luminous and non-luminous generator: A luminous generator, such as an incandescent bulb, produces both visible light and non-visible radiation (e.g., infrared). A non-luminous generator, such as an infrared lamp, emits only non-visible radiation.

77. Treatment and dosage for acne vulgaris: The treatment for acne vulgaris may include topical medications (e.g., benzoyl peroxide, retinoids), oral medications (e.g., antibiotics, isotretinoin), and various therapies. Dosage and treatment duration depend on the severity of the acne and individual patient factors, and should be determined by a healthcare professional.

78. Contrast bath: Contrast bath is a therapeutic technique that involves alternating hot and cold water immersions or compresses. It is used to promote circulation, reduce pain and inflammation, and facilitate healing in conditions such as sprains, strains, and joint stiffness.

79. Paraffin wax bath: Paraffin wax bath is a therapeutic technique that involves immersing body parts, typically hands or feet, in a warm mixture of paraffin wax and mineral oil. This technique helps to moisturize and soften the skin, reduce pain and stiffness, and improve blood flow.

80. Spacing in SWD: Spacing in short wave diathermy (SWD) refers to the distance between the patient's body and the SWD applicator. The spacing can affect the intensity and depth of heat delivered to the tissues. Proper spacing is important to ensure effective and safe treatment.

81. Laws governing radiation: The laws governing radiation include the inverse square law, which states that the intensity of radiation decreases with the square of the distance from the source; the law of conservation of energy, which states that energy cannot be created or destroyed, only transferred or transformed; and the law of photoelectric effect, which states that the energy of a photon is directly proportional to its frequency.

82. Magnetron: A magnetron is a device used in microwave ovens to generate microwave radiation. It consists of a vacuum tube with a cathode and an anode, as well as a magnetic field produced by permanent magnets or electromagnets. The interaction between the magnetic field and the electrons emitted by the cathode causes the electrons to move in a circular path, creating microwave radiation.

83. Treatment parameters of ultrasound: The treatment parameters of ultrasound include frequency, intensity, duty cycle, and treatment duration. Frequency refers to the number of sound waves per second and is typically measured in megahertz (MHz). Intensity refers to the power of the ultrasound waves and is typically measured in watts per square centimeter (W/cm^2). Duty cycle refers to the ratio of time the ultrasound is on to the total treatment time. Treatment duration refers to the length of time the ultrasound is applied to the body.

84. Alpine sun lamp: An alpine sun lamp is a type of light therapy device that mimics the natural light found at high altitudes. It is used to treat conditions such as seasonal affective disorder (SAD) and sleep disorders. The lamp emits bright light that simulates sunlight, which can help regulate circadian rhythms and improve mood.

85. Ruby laser: A ruby laser is a type of solid-state laser that uses a synthetic ruby crystal as the laser medium. When the ruby crystal is stimulated with a flash lamp or another light source, it emits a narrow beam of red light at a specific wavelength of 694.3

nanometers. Ruby lasers are used in various applications, including dermatology, ophthalmology, and scientific research.

86. Circuit diagram production of SWD and its label: The circuit diagram production of shortwave diathermy (SWD) involves illustrating the electrical components and connections within the SWD machine. The diagram typically includes labels for each component, such as the power source, transformer, vacuum tubes, capacitors, and switches. The labels help identify and understand the function of each component within the circuit.

87. Filters used in UVR: Filters used in ultraviolet radiation (UVR) are designed to selectively block or absorb specific wavelengths of UV light. Common filters used in UVR include glass filters, which absorb UVB and UVC radiation; plastic filters, which absorb UVA radiation; and metal oxide filters, which block both UVA and UVB radiation.

88. Contrast bath: Contrast bath is a therapeutic technique used in physical therapy and rehabilitation. It involves alternating immersion of a body part in warm water and cold water. The warm water dilates blood vessels and promotes blood flow, while the cold water constricts blood vessels and reduces inflammation. This alternating hot and cold treatment can help reduce pain, swelling, and promote healing.

89. Hydrocollator pack: A hydrocollator pack is a hot pack used in physical therapy and sports medicine. It consists of a fabric pouch filled with a gel-like substance that can be heated in a hydrocollator unit or hot water. The pack is then applied to the body to provide heat therapy, promote circulation, and relieve muscle pain or stiffness.

90. Hubbard tank: A Hubbard tank, also known as an underwater treadmill or hydrotherapy tank, is a device used in aquatic therapy. It consists of a water-filled tank with a treadmill or walking platform at the bottom. Patients can walk or exercise in the tank while the buoyancy of the water reduces the load on their joints, allowing for low-impact rehabilitation and conditioning.

91. Contraindications for ultraviolet rays: Contraindications for ultraviolet rays include certain skin conditions such as lupus, eczema, and psoriasis; photosensitivity disorders; active infections; certain medications that increase sensitivity to UV radiation; and a history of skin cancer. It is important to assess a patient's medical history and skin condition before exposing them to ultraviolet rays.

92. Calculation of dosage in ultraviolet treatment: The dosage in ultraviolet treatment is typically calculated based on the patient's skin type, the desired therapeutic effect, and the intensity of the UV radiation source. Dosage is measured in joules per square centimeter (J/cm^2) and can be calculated using the formula: Dosage (J/cm^2) = Exposure time (seconds) x Intensity (W/cm^2).

93. Theraktin tunnel: The Theraktin tunnel is a type of therapeutic device used in physical therapy and rehabilitation. It consists of a tunnel-like structure with strategically placed infrared lamps that emit heat. Patients can walk or exercise through the tunnel, allowing the infrared heat to penetrate their muscles and joints, promoting relaxation, pain relief, and improved circulation.

94. Drugs used in phonophoresis: Phonophoresis is a technique that combines ultrasound therapy with the topical application of medications. Common drugs used in phonophoresis include nonsteroidal anti-inflammatory drugs (NSAIDs) such as diclofenac and ibuprofen, as well as corticosteroids such as dexamethasone. The ultrasound waves help enhance the absorption of these medications through the skin and into the underlying tissues.

95. Pulsed mode of ultrasound: The pulsed mode of ultrasound therapy involves delivering ultrasound waves in intermittent bursts or pulses, rather than continuously. This allows for periodic rest periods between each pulse, reducing the overall heat generated by the ultrasound waves. Pulsed ultrasound is commonly used in acute or inflammatory conditions where heat may exacerbate symptoms or delay healing.

96. Management of low back pain: The management of low back pain typically involves a combination of conservative treatments such as physical therapy, exercise, pain medications, and lifestyle modifications. Physical therapy may include techniques such as heat or cold therapy, ultrasound, electrical stimulation, manual therapy, and therapeutic exercises to strengthen the core muscles and improve flexibility.

97. Pulsed shortwave diathermy (SWD) and its application: Pulsed SWD is a form of diathermy therapy that uses high-frequency electromagnetic waves to generate heat in the body tissues. Unlike continuous SWD, pulsed SWD delivers the electromagnetic waves in intermittent bursts or pulses, allowing for rest periods between each pulse. Pulsed SWD is commonly used to promote tissue healing, reduce pain and inflammation, and improve joint mobility.

98. Physiological effects of heat: Heat therapy, such as the application of warm packs or heating pads, can have several physiological effects on the body. These include increased blood flow to the area, vasodilation of blood vessels, increased metabolism and cellular activity, relaxation of muscles, decreased pain and muscle spasms, and improved tissue extensibility.

99. Therapeutic effects and uses of cryotherapy: Cryotherapy, or the application of cold therapy, can have several therapeutic effects on the body. These include vasoconstriction of blood vessels, decreased blood flow and inflammation, reduced pain and swelling, numbing or analgesic effect, and muscle relaxation. Cryotherapy is commonly used in the management of acute injuries, post-surgical recovery, and to alleviate pain and inflammation in chronic conditions.

100. Properties of HF current: High-frequency (HF) current is a type of electrical current used in electrotherapy. It has several properties, including high frequency (typically above 100,000 Hz), low voltage, low resistance, and high oscillation rate. HF current is commonly used in treatments such as diathermy, electrocoagulation, and electrosurgery.

101. Cross-fire method in SWD: The cross-fire method in shortwave diathermy (SWD) involves using two SWD electrodes placed at a right angle to each other, creating a cross pattern of electromagnetic waves. This method allows for a more uniform distribution of heat and deeper penetration of the electromagnetic waves into the tissues.

102. Vapocoolant spray: Vapocoolant spray is a topical analgesic that is sprayed onto the skin to provide temporary pain relief. It works by rapidly evaporating upon contact with the skin, creating a cooling effect that numbs the area and reduces pain. Vapocoolant spray is commonly used in the treatment of musculoskeletal injuries and during certain medical procedures.

103. Emitters and its types: Emitters are devices that emit or generate a specific type of energy or radiation. In physical therapy, emitters are commonly used in modalities such as ultrasound, diathermy, and laser therapy. Types of emitters used in these modalities include ultrasound transducers, electromagnetic coils, and laser diodes.

104. Contraindications of laser: Contraindications of laser therapy include pregnancy, certain skin conditions or disorders, active infections, photosensitivity, a history of skin

cancer, and the presence of metallic implants or devices in the treatment area. It is important to assess a patient's medical history and skin condition before administering laser therapy.

105. PUVA apparatus: PUVA stands for psoralen plus ultraviolet A therapy. It is a type of phototherapy used to treat various skin conditions, including psoriasis, vitiligo, and eczema. The PUVA apparatus consists of a UVA light source and a medication called psoralen, which is either applied topically or taken orally. The combination of psoralen and UVA light helps to reduce inflammation and promote skin repigmentation.

106. Sensitizers: Sensitizers are substances that enhance the skin's sensitivity to light or radiation. In phototherapy, sensitizers are often used in conjunction with a specific light source to treat certain skin conditions. For example, in photodynamic therapy for skin cancer, a photosensitizing agent is applied topically or injected into the body, which is then activated by a specific light source to destroy cancer cells.

107. Cable method for SWD: The cable method for shortwave diathermy (SWD) involves using a pair of cables with electrodes attached to deliver the electromagnetic waves to the treatment area. One cable is connected to the SWD machine, while the other cable is connected to the patient's body. This method allows for precise control and application of the electromagnetic waves.

108. Contrast bath: Contrast bath is a therapeutic technique used in physical therapy and rehabilitation. It involves alternating immersion of a body part in warm water and cold water. The warm water dilates blood vessels and promotes blood flow, while the cold water constricts blood vessels and reduces inflammation. This alternating hot and cold treatment can help reduce pain, swelling, and promote healing.

109. Physiological effects of heat: Heat therapy, such as the application of warm packs or heating pads, can have several physiological effects on the body. These include increased blood flow to the area, vasodilation of blood vessels, increased metabolism and cellular activity, relaxation of muscles, decreased pain and muscle spasms, and improved tissue extensibility.

110. Microwave diathermy: Microwave diathermy is a type of deep heating modality that uses high-frequency electromagnetic waves in the microwave range to generate heat in the body tissues. It is commonly used to treat deep musculoskeletal conditions, such as

joint pain, muscle spasms, and inflammation. Microwave diathermy can penetrate deeper into the tissues compared to other heating modalities.

111. Phonophoresis: Phonophoresis is a technique that combines ultrasound therapy with the topical application of medications. The ultrasound waves help enhance the absorption of these medications through the skin and into the underlying tissues. Phonophoresis is commonly used to deliver anti-inflammatory medications, such as NSAIDs or corticosteroids, to treat localized musculoskeletal conditions.

112. Piezoelectric effect: The piezoelectric effect is a phenomenon in which certain materials, such as certain crystals or ceramics, generate an electric charge when subjected to mechanical stress or pressure. In ultrasound therapy, piezoelectric crystals in the transducer convert electrical energy into mechanical vibrations, which then generate ultrasound waves. The reverse piezoelectric effect also occurs, where the crystals generate mechanical vibrations when subjected to an electric field.

113. Pain Gate Theory: The Pain Gate Theory, also known as the Gate Control Theory of Pain, suggests that the perception of pain is influenced by the balance of activity between small nerve fibers that transmit pain signals and larger nerve fibers that transmit non-painful touch signals. According to this theory, activating the larger nerve fibers through techniques such as massage, heat, or vibration can help close the "gate" and reduce the transmission of pain signals to the brain.

114. Pulsed shortwave: Pulsed shortwave diathermy (SWD) is a form of diathermy therapy that delivers high-frequency electromagnetic waves in intermittent bursts or pulses. The pulsed mode allows for rest periods between each pulse, reducing the overall heat generated by the electromagnetic waves. Pulsed SWD is commonly used to promote tissue healing, reduce pain and inflammation, and improve joint mobility.

115. Electromagnetic Spectrum: The electromagnetic spectrum is the range of all possible frequencies of electromagnetic radiation. It includes various types of radiation, such as radio waves, microwaves, infrared, visible light, ultraviolet, X-rays, and gamma rays. Each type of radiation has different properties and applications in various fields, including medicine, telecommunications, and astronomy.

116. Use of UVR in Alopecia: Ultraviolet radiation (UVR) can be used as a treatment for alopecia, a condition characterized by hair loss. UVR therapy stimulates hair growth by promoting blood circulation and increasing the production of melanin, the pigment

responsible for hair color. It can also help reduce inflammation and improve the overall health of the scalp. However, it is important to use UVR therapy under the guidance of a healthcare professional to ensure safety and effectiveness.

117. Microwave diathermy: Microwave diathermy is a therapeutic technique that uses electromagnetic waves in the microwave frequency range to generate heat deep within the body tissues. It is commonly used in physical therapy to provide pain relief, increase blood flow, and promote tissue healing. Microwave diathermy can be applied using either continuous or pulsed modes, depending on the specific treatment goals and patient needs.

118. Condenser field method: The condenser field method is a technique used in electrotherapy to deliver electrical stimulation to specific areas of the body. It involves using a condenser electrode, which consists of a metal plate or mesh, to create a concentrated electric field in the desired treatment area. This method allows for precise targeting of electrical stimulation and can be used to treat various conditions, such as pain, muscle weakness, and muscle spasms.

119. Lewis hunting reaction: The Lewis hunting reaction is a test used to assess the integrity of the peripheral nervous system. It involves applying a hot or cold stimulus to the skin and observing the resulting vasodilation or vasoconstriction response. This reaction helps to identify any abnormalities or disturbances in the nerves responsible for temperature regulation and blood flow. The Lewis hunting reaction is commonly used in the diagnosis and management of conditions such as neuropathy and Raynaud's disease.

120. Water bag method of ultrasound application: The water bag method is a technique used to apply ultrasound therapy to the body. It involves filling a plastic bag with water and placing it on the area to be treated. The water acts as a medium for the ultrasound waves, allowing them to penetrate the tissues and provide therapeutic effects. This method is commonly used in physical therapy to promote tissue healing, reduce pain and inflammation, and improve joint mobility.

121. Laws governing radiation: There are several laws and regulations that govern the use of radiation in various fields, including healthcare. These laws aim to ensure the safe and appropriate use of radiation, while minimizing the risks to both patients and healthcare professionals. Some of the key laws governing radiation include the ALARA (As Low

As Reasonably Achievable) principle, which emphasizes the importance of minimizing radiation exposure, and the use of personal protective equipment, such as lead aprons and thyroid shields, to reduce radiation exposure.

122. Magnetron: A magnetron is a device used to generate microwave radiation. It consists of a vacuum tube with a cathode and anode, surrounded by a magnetic field. When an electric current is applied, the interaction between the electrons and the magnetic field causes the generation of high-frequency electromagnetic waves, which are then emitted as microwaves. Magnetrons are commonly used in various applications, including microwave ovens, radar systems, and microwave diathermy devices.

123. Electromagnetic spectrum: The electromagnetic spectrum refers to the entire range of electromagnetic waves, which includes radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X-rays, and gamma rays. Each type of electromagnetic wave has a unique frequency and wavelength, and they differ in their interactions with matter. The electromagnetic spectrum is important in various fields, including physics, telecommunications, and healthcare, as it allows for the understanding and utilization of different types of radiation.

124. Therapeutic effects of ultrasound: Ultrasound therapy has several therapeutic effects on the body. It can promote tissue healing by increasing blood flow and oxygen delivery to the treated area. Ultrasound waves also have a mechanical effect, causing vibrations and micro-massage within the tissues, which can help reduce pain and inflammation. Additionally, ultrasound therapy can improve the extensibility of soft tissues, such as muscles and tendons, and enhance the effectiveness of other treatment modalities, such as stretching exercises.

125. Indications for infrared radiation: Infrared radiation is used in various therapeutic applications due to its ability to penetrate deep into the tissues and generate heat. It is commonly indicated for conditions such as muscle and joint pain, arthritis, and muscle spasms. Infrared radiation can help improve blood circulation, relax muscles, reduce pain and inflammation, and promote tissue healing. However, it is important to use infrared radiation under the guidance of a healthcare professional to ensure safety and effectiveness.

126. Test dose: A test dose is a small amount of a medication or treatment that is administered to assess the patient's response and tolerance. It is commonly used to

determine the appropriate dosage and to identify any potential adverse reactions or allergies. A test dose is usually given before starting a new medication or treatment, especially if the patient has a history of sensitivity or allergic reactions.

127. Properties of laser: Laser stands for Light Amplification by Stimulated Emission of Radiation. It is a device that emits a concentrated beam of coherent light. Some

128. Faradic coil: A Faradic coil is a type of electrode used in electrical stimulation therapy. It consists of a coil of wire that produces a pulsed electrical current when connected to a power source. This type of electrode is commonly used to stimulate muscles and nerves for therapeutic purposes.

129. Therapeutic uses of electricity: Electricity has various therapeutic uses in the field of physical therapy. Some of the therapeutic uses of electricity include pain management, muscle strengthening, nerve stimulation, tissue healing, and edema reduction. Electrical modalities such as TENS (Transcutaneous Electrical Nerve Stimulation), Iontophoresis, and Electrical Muscle Stimulation (EMS) are commonly used in physical therapy for these purposes.

130. Faradic Foot bath: Faradic foot bath is a therapeutic technique in which the feet are immersed in a bath of warm water while a low-frequency electrical current is applied. The electrical current is generated by a Faradic coil and is used to stimulate the muscles and nerves in the feet. This technique is often used for improving circulation, relieving pain, and promoting relaxation.

131. Sweep frequency: Sweep frequency is a feature of some electrical stimulation devices where the frequency of the electrical current is continuously varied within a specific range. This variation in frequency helps to prevent muscle accommodation and allows for a more effective stimulation of the muscles and nerves. Sweep frequency is commonly used in interferential therapy.

132. Ions used in Iontophoresis: Iontophoresis is a therapeutic technique in which ions are delivered into the body through the skin using a low-level electrical current. The ions commonly used in iontophoresis include medications such as corticosteroids, lidocaine, and acetic acid. These ions are delivered to the targeted area to provide localized pain relief, reduce inflammation, or promote tissue healing.

133. Biofeedback: Biofeedback is a therapeutic technique in which patients are provided with real-time information about their physiological processes, such as heart rate,

muscle activity, or skin temperature. This information is typically displayed on a monitor, allowing patients to learn how to control these processes and improve their health. Biofeedback is commonly used for stress management, pain management, and rehabilitation purposes.

134. Erb's palsy and its management: Erb's palsy is a condition that affects the movement and strength of the arm due to injury to the brachial plexus during childbirth. Management of Erb's palsy typically involves physical therapy techniques such as range of motion exercises, strengthening exercises, electrical stimulation, and functional training. The goal of management is to improve the function and mobility of the affected arm.

135. Types of nerve lesions: Nerve lesions refer to damage or injury to a nerve. There are different types of nerve lesions, including neurapraxia, axonotmesis, and neurotmesis. Neurapraxia is the mildest form of nerve injury, where the nerve is temporarily damaged but not severed. Axonotmesis involves damage to the nerve fibers, but the connective tissue covering remains intact. Neurotmesis is the most severe form, where the nerve is completely severed.

136. Voltmeter: A voltmeter is an electrical instrument used to measure the voltage or electrical potential difference between two points in an electrical circuit. It is typically connected in parallel to the circuit and provides a numerical reading of the voltage in volts.

137. Types of electrodes used in interferential therapy: Interferential therapy uses four electrodes placed on the skin to deliver electrical stimulation. The two types of electrodes commonly used in interferential therapy are surface electrodes and adhesive electrodes. Surface electrodes are typically made of metal and have a large surface area for better conductivity. Adhesive electrodes are made of a conductive gel or adhesive material and are easier to apply and remove.

138. Brief intense TENS: Brief intense TENS is a type of transcutaneous electrical nerve stimulation that involves the application of a high-frequency electrical current for a short duration. It is typically used for acute pain management and is believed to work by stimulating the release of endorphins, which are natural pain-relieving chemicals in the body.

139. Synapse: A synapse is a junction between two nerve cells, where electrical or chemical signals are transmitted from one cell to another. It is the site where nerve impulses are transferred from the axon of one neuron to the dendrites or cell body of another neuron.

140. Sinusoidal waveform: A sinusoidal waveform is a type of electrical waveform that resembles a sine wave. It is characterized by a smooth, continuous oscillation between positive and negative values. Sinusoidal waveforms are commonly used in electrical stimulation therapy due to their ability to produce a comfortable and tolerable sensation.

141. Prevention of shock: To prevent electrical shock during therapeutic electrical stimulation, it is important to ensure proper equipment setup and safety precautions. This includes inspecting the equipment for any damage or defects, ensuring proper grounding, using appropriate electrode placement and size, and following manufacturer guidelines for device operation. It is also important to educate patients on safety precautions and to monitor them closely during treatment.

142. Functional electrical stimulation: Functional electrical stimulation (FES) is a therapeutic technique that uses electrical currents to stimulate paralyzed or weakened muscles. It is commonly used in rehabilitation to improve muscle strength, coordination, and function in individuals with neurological conditions such as spinal cord injury or stroke.

143. 'F' wave: An 'F' wave is an electrical waveform that is recorded during nerve conduction studies. It represents the activation of motor neurons and reflects the conduction of an impulse along the motor nerve fibers. 'F' waves are typically elicited by stimulating a peripheral nerve and recording the response from a muscle.

144. Wrist drop: Wrist drop is a condition characterized by the inability to extend or lift the wrist due to weakness or paralysis of the muscles responsible for this movement. It is often caused by nerve damage, such as radial nerve injury or compression.

145. Bell's palsy: Bell's palsy is a condition that causes sudden weakness or paralysis of the muscles on one side of the face. It is believed to be caused by inflammation or viral infection of the facial nerve. Management of Bell's palsy may include physical therapy techniques such as electrical stimulation, massage, and facial exercises to improve muscle strength and function.

146. Different theories of pain: There are several theories of pain that attempt to explain how pain is perceived and processed by the body. Some of the commonly accepted theories include the Gate Control Theory, which suggests that pain signals can be modulated by other sensory inputs, and the Neuromatrix Theory, which proposes that pain is a complex output of the brain that is influenced by various factors such as emotions and past experiences.

147. Methods of application of iontophoresis: Iontophoresis can be applied using different methods, including direct application, bath technique, and pad technique. In the direct application method, the iontophoresis electrode is placed directly on the skin over the targeted area. In the bath technique, the area to be treated is immersed in a bath of ionized solution, and electrical current is applied through the water. In the pad technique, a pad soaked in the ionized solution is placed on the skin, and electrical current is applied through the pad.

148. Different types of waveforms: There are various types of waveforms used in electrical stimulation therapy, including square wave, triangular wave, rectangular wave, and sinusoidal wave. Each waveform has different characteristics and is used for specific therapeutic purposes.

149. Nerve conduction test: Nerve conduction test, also known as nerve conduction study, is a diagnostic test used to assess the function and integrity of nerves. It involves the application of electrical stimuli to a nerve and the measurement of the resulting electrical responses from the muscles or nerves. This test can help identify nerve damage, compression, or other abnormalities.

150. Physiological effects of IFT: Interferential therapy (IFT) has various physiological effects on the body. These effects include pain relief, increased blood flow, muscle relaxation, reduction of muscle spasms, and promotion of tissue healing. IFT works by stimulating sensory nerves, increasing endorphin release, improving circulation, and enhancing muscle function.

151. Dangers of interferential therapy: While interferential therapy is generally considered safe, there are some potential dangers associated with its use. These include skin irritation or burns due to improper electrode placement or excessive current intensity, interference with pacemakers or other implanted devices, and the risk of electric shock if safety precautions

152. Deltoid inhibition refers to a technique used in physical therapy to relax and reduce the activity of the deltoid muscle, typically to address shoulder pain or dysfunction.

153. TENS (Transcutaneous Electrical Nerve Stimulation) is a treatment method for low back pain that involves the application of electrical stimulation to the affected area via electrodes placed on the skin. It is believed to help alleviate pain by stimulating the nerves and promoting the release of endorphins.

154. An ammeter is a device used to measure electric current in a circuit. It is typically connected in series with the circuit and provides a reading of the current flow.

155. Therapeutic currents can pose certain dangers if not used properly. These include burns, skin irritation, muscle contractions, and electrical shock. To prevent these risks, it is important to follow safety guidelines, use appropriate settings, and ensure proper electrode placement.

156. The Pain Gate Theory suggests that pain signals can be modulated or blocked by non-painful sensory input. According to this theory, when non-painful stimuli are applied to the body, they can close or "gate" the neural pathways that transmit pain signals, reducing the perception of pain.

157. Treatment for radial nerve palsy may involve various approaches such as splinting, physical therapy exercises to strengthen muscles, nerve gliding exercises, and electrical stimulation techniques like TENS or NMES (Neuromuscular Electrical Stimulation) to promote muscle activation and recovery.

158. Faradism under pressure is a therapeutic technique that involves the use of electrical stimulation, specifically Faradic current, combined with mechanical pressure or massage. It is commonly used for muscle strengthening, pain relief, and improving circulation.

159. Nerve conduction tests are diagnostic procedures used to assess the function and integrity of peripheral nerves. It involves the application of electrical stimulation to specific nerves and recording the resulting electrical activity to evaluate nerve conduction velocity and detect abnormalities.

160. IFT (Interferential Therapy) is a form of electrical stimulation that uses two medium-frequency alternating currents to produce a low-frequency therapeutic waveform. Its

physiological effects include pain relief, muscle relaxation, increased blood flow, and promotion of tissue healing.

161. Dangers of interferential therapy can include burns, skin irritation, muscle contractions, and electrical shock. It is important to follow safety guidelines, use appropriate settings, and ensure proper electrode placement to minimize these risks.

162. Action potential refers to the brief change in electrical potential that occurs in a nerve or muscle cell when stimulated, resulting in the transmission of an electrical impulse along the cell membrane.

163. The neuromuscular junction is the point of communication between a nerve cell (motor neuron) and a muscle fiber. It is where the electrical signal from the nerve is converted to a chemical signal (neurotransmitters) that triggers muscle contraction.

164. Impulses can be classified into two types: sensory impulses and motor impulses. Sensory impulses are signals transmitted from sensory receptors to the brain, while motor impulses are signals transmitted from the brain to muscles or glands, resulting in movement or secretion.

165. Shock can have various causes, including electrical shock, hypovolemic shock (due to severe blood loss), cardiogenic shock (due to heart failure), anaphylactic shock (due to severe allergic reaction), and septic shock (due to severe infection).

166. Diadynamic current is a type of electrical stimulation used in physical therapy. It involves the application of a low-frequency, modulated current that can have analgesic, muscle-stimulating, and vasodilatory effects.

167. H Reflex is a neurophysiological test used to assess the integrity and function of the spinal cord and peripheral nerves. It involves stimulating a nerve and measuring the reflex response in a target muscle.

168. Foot drop is a condition characterized by difficulty or inability to lift the front part of the foot, resulting in dragging the foot while walking. It can be caused by various factors, including nerve damage, muscle weakness, or neurological disorders.

169. Transcutaneous Electrical Nerve Stimulation (TENS) can be classified into two types: conventional TENS and acupuncture-like TENS. Conventional TENS involves the use of high-frequency electrical stimulation to alleviate pain, while acupuncture-like TENS involves the use of low-frequency stimulation to activate specific acupuncture points.

170. Neuropraxia is a type of nerve injury characterized by temporary loss of nerve function without structural damage. It typically occurs due to compression, stretching, or mild trauma to a nerve, and the symptoms usually resolve within a few weeks or months.

171. The electrotherapy management of Bell's palsy may involve various modalities such as electrical stimulation (TENS, NMES), facial exercises, massage, heat therapy, and cold therapy. The aim is to promote muscle activation, improve blood flow, reduce pain, and enhance facial muscle function.

172. Functional Electrical Stimulation (FES) is a technique that involves the application of electrical stimulation to activate paralyzed or weak muscles. It is commonly used in rehabilitation settings to assist with muscle strengthening, restoring function, and improving mobility.

173. Interrupted direct current refers to a type of electrical current that is delivered in a discontinuous manner, with alternating periods of current flow and no current flow. It is commonly used in electrotherapy for various therapeutic purposes.

174. Moving-coil milliammeter is a type of ammeter used to measure small electrical currents. It consists of a coil suspended in a magnetic field, which deflects in response to the current flow, providing a reading of the current magnitude.

175. Faradic current can be produced by a Faradic generator or Faradic machine. These devices generate alternating current with specific frequency and waveform characteristics, which are used in various electrotherapy applications.

176. Electrotherapy modalities used to strengthen muscles include NMES (Neuromuscular Electrical Stimulation), FES (Functional Electrical Stimulation), and Russian stimulation. These modalities involve the application of electrical currents to stimulate muscle contractions and promote muscle strengthening and rehabilitation.

177. Gate control theory of pain is a theory that suggests that the perception of pain is influenced by the balance between the input of pain signals and the non-painful sensory signals that reach the brain. According to this theory, the "gate" in the spinal cord can either allow or block the transmission of pain signals to the brain, depending on the amount and type of sensory input.

178. Interferential therapy is a type of electrotherapy that involves the use of two or more electrical currents that are applied to the body at different frequencies. These currents

intersect and interfere with each other, producing a therapeutic effect. Interferential therapy is commonly used for pain relief, muscle stimulation, and edema reduction.

179. Biofeedback is a technique that involves the use of electronic devices to monitor and provide feedback on physiological processes in the body. It allows individuals to gain awareness and control over normally involuntary bodily functions, such as heart rate, blood pressure, muscle tension, and brainwave activity. Biofeedback is used in various fields, including rehabilitation, stress management, and performance enhancement.

180. A fuse is a safety device that is designed to protect an electrical circuit from excessive current. It consists of a metal wire or strip that melts when the current exceeds a certain level, thereby interrupting the flow of electricity and preventing damage to the circuit or electrical equipment.

181. Earth shock refers to an electric shock that occurs when a person comes into contact with an electrical conductor that is connected to the ground or earth. It can happen due to faulty wiring, damaged electrical equipment, or improper grounding. Earth shocks can be dangerous and may cause injury or even death.

182. The effects of direct current (DC) depend on various factors, such as the magnitude and duration of the current, the pathway it takes through the body, and the resistance of the tissues involved. DC can cause muscle contractions, electrolysis (chemical reactions), tissue damage, and nerve stimulation. It is commonly used in electrotherapy for muscle stimulation and wound healing.

183. Semiconductors are materials that have properties intermediate between conductors and insulators. They have the ability to conduct electricity under certain conditions, such as when exposed to light or heat. Semiconductors are widely used in electronic devices, such as transistors, diodes, and integrated circuits.

184. Indications of interferential therapy include pain relief, muscle stimulation, edema reduction, and improved blood circulation. Contraindications include pacemakers, pregnancy, epilepsy, malignancy, and open wounds.

185. Safety devices used in electrotherapy include circuit breakers, ground fault circuit interrupters (GFCIs), isolation transformers, and protective grounding.

186. Wallerian degeneration is a process that occurs after an injury to a nerve fiber. It involves the degeneration and disintegration of the distal part of the nerve fiber, which

is separated from the cell body. Wallerian degeneration is a necessary step for nerve regeneration to occur.

187. Faradic footbath is a therapeutic technique that involves immersing the feet in a bath of water and applying a low-frequency electrical current to stimulate the muscles and nerves. It is commonly used for foot and leg pain, muscle weakness, and circulatory disorders.

188. Electromyography (EMG) is a diagnostic technique that involves the recording and analysis of the electrical activity produced by skeletal muscles. It is used to assess muscle function, detect neuromuscular disorders, and aid in the diagnosis and treatment of various conditions.

189. Parameters of interferential therapy include frequency, intensity, duration, and electrode placement. These parameters can be adjusted to achieve the desired therapeutic effect and optimize patient comfort.

190. Indications of faradic current include muscle stimulation, pain relief, edema reduction, and improved blood circulation. Faradic current is commonly used in physical therapy and rehabilitation.

191. A transformer is an electrical device that is used to transfer electrical energy between two or more circuits through electromagnetic induction. It consists of two or more coils of wire (windings) that are wound around a common iron core. Transformers are used to step up or step down the voltage of alternating current (AC) and are commonly found in power distribution systems.

192. The strength-duration curve is a graph that illustrates the relationship between the strength (intensity) and duration of an electrical stimulus required to elicit a muscle or nerve response. It helps determine the optimal parameters for electrical stimulation therapy.

193. Radial nerve palsy refers to the dysfunction or paralysis of the radial nerve, which can result in weakness or loss of movement and sensation in the arm, wrist, and hand. It can be caused by trauma, compression, or nerve entrapment.

194. Thermionic valves, also known as vacuum tubes, are electronic devices that control the flow of electric current in a circuit through the emission and control of electrons. They

were widely used in early electronic equipment, such as radios and televisions, before the advent of solid-state devices.

195. A potentiometer is a variable resistor that is used to control the flow of electric current in a circuit. It consists of a resistive element and a movable contact (slider) that allows the resistance to be adjusted. Potentiometers are commonly used in volume controls, dimmer switches, and analog joysticks.

196. Transcutaneous Electrical Nerve Stimulation (TENS) is a therapy that involves the application of low-frequency electrical currents through electrodes placed on the skin. It is used for pain relief by stimulating the nerves and blocking the transmission of pain signals to the brain.

197. Faradic galvanic test is a diagnostic test that involves the application of a low-frequency electrical current to a muscle or nerve to assess its function and response. It is commonly used in neurophysiology and rehabilitation.

198. Deltoid inhibition refers to the temporary suppression or reduction of the activity of the deltoid muscle. It can be achieved through various techniques, such as manual pressure, electrical stimulation, or positional changes. Deltoid inhibition is commonly used in rehabilitation to facilitate the activation of other muscles or to reduce muscle spasm.

199. Faradism under pressure is a therapeutic technique that involves the application of a low-frequency electrical current to a muscle or joint while simultaneously applying pressure. It is commonly used for pain relief, muscle stimulation, and joint mobilization.

200. The pain pathway refers to the series of steps that occur when a painful stimulus is detected and transmitted from the site of injury or irritation to the brain. It involves the activation of sensory receptors, the transmission of nerve impulses along sensory pathways, and the processing of pain signals in the brain.

201. A voltmeter is an instrument used to measure the voltage or potential difference between two points in an electrical circuit. It is typically connected in parallel to the circuit and provides a numerical value or reading of the voltage.

202. Parameters of interferential therapy include frequency, intensity, duration, and electrode placement. These parameters can be adjusted to achieve the desired therapeutic effect and optimize patient comfort.

203. Saturday night palsy refers to a condition where compression or injury to the radial nerve in the arm leads to weakness or paralysis of the wrist and hand muscles.

204. Deltoid inhibition is a technique used in physical therapy to inhibit or decrease the activity of the deltoid muscle in order to facilitate or strengthen other muscles.

205. TENS stands for Transcutaneous Electrical Nerve Stimulation. There are different types of TENS units, such as conventional TENS, burst mode TENS, and modulated TENS, which are used to provide pain relief by delivering electrical stimulation to the nerves.

206. Accommodation refers to the process by which the body adjusts and adapts to a stimulus over time. In the context of sensory perception, accommodation allows us to maintain a clear and focused image on an object as it moves closer or farther away.

207. Iontophoresis is a therapeutic technique that uses a small electrical current to deliver medication or other substances through the skin and into the underlying tissues. It is commonly used in physical therapy for conditions such as inflammation, pain, and excessive sweating.

208. Resistance in series and parallel are concepts in electrical circuits. In series, the total resistance is the sum of individual resistances, while in parallel, the reciprocal of the total resistance is the sum of the reciprocals of individual resistances.

209. Radial nerve palsy occurs when there is damage or compression to the radial nerve, leading to weakness or paralysis of the muscles controlled by the nerve, mainly in the forearm and hand.

210. A triode valve, also known as a vacuum tube or thermionic valve, is an electronic component used to amplify or switch electronic signals. It consists of three main components: a cathode, an anode, and a control grid.

211. Rectifiers are electronic devices used to convert alternating current (AC) into direct current (DC). They are commonly used in power supplies and electronic circuits to ensure that the current flows in one direction.

212. Interferential therapy is a type of electrical stimulation used in physical therapy to relieve pain, promote tissue healing, and reduce muscle spasms. It involves the use of two or more electrical currents that intersect and interfere with each other to produce therapeutic effects.

213. The pain gate theory suggests that non-painful sensory input can inhibit or "close the gate" for painful stimuli, modulating the perception of pain. It explains how factors such as massage, heat, or electrical stimulation can help alleviate pain.

214. The Smart Bristow Faradic Coil is a specific type of electrical stimulation device used in physical therapy for muscle strengthening and rehabilitation. It utilizes a coil that generates electrical impulses to stimulate the muscles.

215. Electric shock refers to the physical sensation or injury caused by the passage of an electric current through the body. It can range from mild discomfort to severe burns or cardiac arrest, depending on the intensity and duration of the shock.

216. Faradism under pressure is a technique that involves the application of electrical stimulation, usually in the form of faradic current, to a body part that is submerged or enclosed in a pressurized container. It is used for various therapeutic purposes, such as reducing edema or promoting wound healing.

217. The propagation of action potential refers to the transmission of electrical impulses along the axon of a neuron. When an action potential is initiated, it travels down the axon, allowing for the communication between neurons and the transmission of signals throughout the nervous system.

218. The gate control theory of pain suggests that the perception of pain is regulated by a gate mechanism in the spinal cord. According to this theory, non-painful input can close the gate and inhibit the transmission of pain signals, while painful input can open the gate and enhance pain perception.

219. Burst mode TENS is a specific mode of transcutaneous electrical nerve stimulation where a series of high-frequency pulses are delivered in bursts with short breaks in between. It is commonly used for pain relief and muscle relaxation.

220. The principles of biofeedback involve using electronic devices to provide real-time information about physiological processes in order to train individuals to control or modify these processes. It can be used for various purposes, such as managing stress, improving muscle control, or treating certain medical conditions.

221. The strength-duration curve in peripheral nerve injury is a graph that illustrates the relationship between the strength and duration of an electrical stimulus required to elicit

a muscle contraction in the presence of nerve damage. It helps assess the extent and severity of nerve injury.

222. Motor nerve conduction test is a diagnostic procedure used to assess the function and integrity of motor nerves. It involves applying electrical stimulation to a nerve and measuring the speed and strength of the resulting muscle contraction.

223. Testing the electrical stimulator apparatus involves checking the functionality, safety, and performance of the electrical stimulation device. This may include verifying the output parameters, ensuring proper electrode placement, and assessing patient comfort during stimulation.

224. Contraindications of iontophoresis are conditions or situations in which the use of iontophoresis is not recommended or should be avoided. Some common contraindications include open wounds, skin infections, pacemakers, and known allergies to the medication or substance being delivered.

225. Biofeedback is a therapeutic technique that enables individuals to gain voluntary control over certain physiological processes by providing them with real-time feedback about those processes. It can have various benefits, such as reducing stress, improving relaxation, enhancing performance, and managing certain medical conditions.

226. The physiological effects of alternating current (AC) include muscle contraction and relaxation, nerve stimulation, tissue heating, and increased blood flow. AC is commonly used in electrical stimulation devices for therapeutic purposes.

227. Faradic foot bath is a therapeutic technique that involves immersing the feet in a bath of warm water while electrical stimulation is applied to the water. It is used to promote circulation, muscle relaxation, and pain relief in the feet and lower legs.

228. Quadriceps inhibition is a condition where the quadriceps muscles in the thigh are not functioning properly. The treatment for quadriceps inhibition typically involves a combination of physical therapy, exercises, and modalities. Physical therapy may include strengthening exercises for the quadriceps muscles, as well as stretching and range of motion exercises. Modalities such as electrical stimulation, ultrasound, or heat therapy may also be used to help improve muscle function and reduce pain. In some cases, bracing or taping techniques may be used to provide support to the knee joint and help improve quadriceps activation.

229. Bell's palsy is a condition that causes temporary weakness or paralysis of the muscles on one side of the face. Treatment for Bell's palsy on the left side typically involves a combination of medications and physical therapy. Medications such as corticosteroids may be prescribed to reduce inflammation and swelling in the facial nerve. Physical therapy may include exercises to improve facial muscle strength and coordination, as well as techniques to improve facial symmetry and control. In some cases, electrical stimulation may be used to help stimulate muscle activity and improve facial function.

230. The Faradic Galvanic test is a diagnostic test used to assess nerve and muscle function. It involves the application of electrical stimulation to a specific area of the body using a Faradic Galvanic device. The test measures the response of the nerves and muscles to the electrical stimulation. The results of the test can provide information about the integrity and function of the nerves and muscles, as well as help diagnose conditions such as nerve damage or muscle weakness.

231. Chronaxie and Rheobase are terms used to describe the properties of electrical stimulation. Chronaxie refers to the minimum duration of an electrical stimulus required to elicit a response from a nerve or muscle fiber, while Rheobase refers to the minimum intensity of an electrical stimulus required to elicit a response. These terms are commonly used in the field of electrotherapy to determine the appropriate parameters for electrical stimulation treatments.

232. A triode valve, also known as a vacuum tube or a thermionic valve, is an electronic device used to amplify or switch electrical signals. It consists of three main components: a cathode, a control grid, and an anode. The triode valve operates by controlling the flow of electrons between the cathode and the anode using the control grid. Triode valves were commonly used in early electronic devices such as radios and televisions.

233. The Faradic - IDC test is a diagnostic test used to assess nerve and muscle function. It involves the application of electrical stimulation to a specific area of the body using a Faradic Galvanic device, followed by the application of direct current (DC) stimulation. The test measures the response of the nerves and muscles to both types of stimulation. The results of the test can provide information about the integrity and function of the nerves and muscles, as well as help diagnose conditions such as nerve damage or muscle weakness.

234. The Glidemester effect is a phenomenon observed during electrical stimulation therapy. It refers to the increase in muscle strength and endurance that occurs after a period of electrical stimulation. The exact mechanism of the Glidemester effect is not fully understood, but it is believed to be related to changes in muscle fiber recruitment and adaptation to the electrical stimulation.

235. Modulation refers to the process of varying the characteristics of an electrical signal. In the context of transcutaneous electrical nerve stimulation (TENS), modulation is used to prevent adaptation and habituation to the electrical stimulation. TENS can be classified based on the type of modulation used, such as burst modulation, frequency modulation, or amplitude modulation. Different types of modulation can have different effects on pain perception and can be used to target specific types of pain.

236. Sterodynamic IFT, also known as interferential therapy, is a type of electrical stimulation therapy used for pain management and tissue healing. It involves the application of two medium-frequency electrical currents that intersect at the treatment area. The intersecting currents create a "beat" frequency that can penetrate deeper into the tissues and provide pain relief. Sterodynamic IFT is commonly used in physical therapy clinics to treat various musculoskeletal conditions.

237. Neuroproxia of the radial nerve refers to a condition where there is damage or compression of the radial nerve, leading to impaired nerve function. Treatment for neuroproxia of the radial nerve typically involves a combination of conservative measures and physical therapy. Conservative measures may include rest, immobilization, and the use of splints or braces to protect the affected area. Physical therapy may include exercises to improve muscle strength and coordination, as well as techniques to reduce pain and promote nerve healing.

238. Functional electrical stimulation (FES) is a technique that uses electrical stimulation to activate paralyzed or weak muscles. It involves the application of electrical currents to specific muscles or nerves to elicit muscle contractions and restore functional movement. FES is commonly used in rehabilitation settings to help individuals with neurological conditions regain motor control and improve their ability to perform daily activities.

239. A fuse is a safety device used to protect electrical circuits from overcurrents. It consists of a metal wire or strip that melts when the current exceeds a certain level, thereby

breaking the circuit and preventing damage to the electrical components. Fuses are commonly used in electrical systems to prevent electrical fires and equipment damage caused by electrical overloads.

240. The production of electromagnetic waves involves the generation of oscillating electric and magnetic fields. This can be achieved through various methods, such as the movement of charged particles, the interaction of electric and magnetic fields, or the acceleration of charged particles. Electromagnetic waves are used in various applications, including communication systems, medical imaging, and cooking.

241. Pain modulation refers to the process of altering the perception of pain. It can be achieved through various mechanisms, such as the activation of endogenous pain control systems, the use of medications, or the application of physical modalities. Pain modulation techniques aim to reduce pain intensity, improve pain tolerance, and enhance overall pain management.

242. Galvanic tetanus ratio is a measure used in electromyography to assess muscle fatigue. It refers to the ratio of the force generated by a muscle during a sustained contraction with direct current (galvanic stimulation) compared to the force generated during a sustained contraction with alternating current (tetanic stimulation). The galvanic tetanus ratio can provide information about muscle fatigue and neuromuscular function.

243. Ultrasound can be applied to the body using different methods, such as direct contact, immersion, or coupling agents like gel or water. The choice of method depends on the area being treated and the desired therapeutic effect. Direct contact involves placing the ultrasound probe directly on the skin, while immersion involves submerging the body part in water and applying the ultrasound through the water. Coupling agents such as gel or water are used to improve the transmission of ultrasound waves from the probe to the body.

244. A moving coil galvanometer is a device used to measure small electric currents. It consists of a coil of wire suspended between the poles of a permanent magnet. When an electric current passes through the coil, it creates a magnetic field that interacts with the magnetic field of the permanent magnet, causing the coil to rotate. The rotation of the coil is proportional to the magnitude of the current being measured.

245. Surgers, also known as surge protectors or surge suppressors, are devices used to protect electrical equipment from voltage spikes or surges. They are designed to divert

excess voltage away from sensitive electronic devices, preventing damage caused by power surges. Surgers typically include a metal oxide varistor (MOV) that absorbs the excess voltage and redirects it to a grounding wire.

246. Transformers are electrical devices used to transfer electrical energy between two or more circuits through electromagnetic induction. They consist of two or more coils of wire, known as windings, and a magnetic core. When an alternating current passes through one of the windings, it creates a changing magnetic field that induces a voltage in the other windings. Transformers are commonly used to step up or step down voltage levels in electrical power distribution systems.

247. High Voltage Pulsed Galvanic Current (HVPGC) is a type of electrical stimulation therapy used for pain management and tissue healing. It involves the application of pulsed direct current (DC) with high voltage to the treatment area. HVPGC can provide pain relief, promote tissue healing, and improve blood circulation. It is commonly used in physical therapy clinics for conditions such as chronic pain, wound healing, and muscle rehabilitation.

248. Interferential Current (IFC) is a type of electrical stimulation therapy used for pain management. It involves the application of two medium-frequency electrical currents that intersect at the treatment area. The intersecting currents create a "beat" frequency that can penetrate deeper into the tissues and provide pain relief. IFC is commonly used in physical therapy clinics to treat various musculoskeletal conditions.

249. Electromagnetic induction is the process of generating an electric current in a conductor by varying the magnetic field around it. It occurs when there is relative motion between a magnet and a conductor or when there is a change in the magnetic field strength. Electromagnetic induction is the fundamental principle behind the operation of electric generators, transformers, and many other electrical devices.

250. Electric shock refers to the physiological and psychological effects that occur when a person comes into contact with an electric current. The severity of an electric shock depends on factors such as the voltage, current, duration of exposure, and the path the current takes through the body. Electric shocks can cause a range of symptoms, from mild tingling sensations to severe burns, muscle contractions, and cardiac arrest. Immediate medical attention is required for severe electric shocks.

251. Diadynamic current is a type of electrical stimulation therapy used for pain management. It involves the application of low-frequency electrical currents with specific waveform characteristics. Diadynamic current can provide pain relief, reduce muscle spasms, and improve blood circulation. It is commonly used in physical therapy clinics for conditions such as musculoskeletal pain, joint stiffness, and edema.

252. The SD curve test, also known as the strength-duration curve test, is a diagnostic test used to assess nerve and muscle excitability. It involves applying electrical stimulation of different intensities and durations to a specific area of the body and measuring the response. The results of the test can provide information about the strength-duration relationship of the nerves and muscles, as well as help diagnose conditions such as nerve damage or hyperexcitability.

253. Sinusoidal current, also known as alternating current (AC), is a type of electrical current that periodically changes direction. It is characterized by a smooth waveform that resembles a sine wave. Sinusoidal current is commonly used in electrical stimulation therapy for pain management and muscle rehabilitation. It can provide pain relief, improve circulation, and promote muscle contraction and relaxation.

254. Therapeutic ultrasound is a modality used for pain management and tissue healing. It involves the application of high-frequency sound waves to the treatment area. The sound waves penetrate deep into the tissues, generating heat and promoting blood flow. Therapeutic ultrasound can provide pain relief, reduce inflammation, and improve tissue healing. It is commonly used in physical therapy clinics for conditions such as musculoskeletal pain, tendonitis, and soft tissue injuries.

255. The Smart Bristow Faradic Coil is a specialized type of electrical stimulation device used for muscle re-education and rehabilitation. It consists of a coil that produces electrical currents and a set of bristles or brushes that deliver the stimulation to the skin. The Smart Bristow Faradic Coil is designed to provide precise and targeted electrical stimulation to specific muscle groups, helping to improve muscle strength, coordination, and function.

256. Recording electrodes for electromyography (EMG) are devices used to detect and record the electrical activity of muscles. They are typically placed on the skin overlying the muscles of interest. Recording electrodes can be surface electrodes, which are placed directly on the skin, or needle electrodes, which are inserted into the muscle

tissue. The electrical signals detected by the electrodes are amplified and recorded, allowing for the evaluation of muscle function and the diagnosis of neuromuscular conditions.

257. The neurophysiology of pain involves the complex processes and pathways that transmit and modulate pain signals in the nervous system. It includes the activation of specialized receptors called nociceptors, the transmission of pain signals to the spinal cord and brain, and the modulation of pain perception by various factors, such as endogenous pain control systems and psychological factors. Understanding the neurophysiology of pain is important for developing effective pain management strategies and treatments.

258. Parameters of Interferential therapy: Interferential therapy involves the use of two medium-frequency currents that intersect and produce a therapeutic effect. The parameters of Interferential therapy include frequency, intensity, modulation, and duration. Frequency refers to the number of cycles per second and is typically set between 4,000 to 5,000 Hz. Intensity refers to the strength of the current and can be adjusted to the patient's tolerance. Modulation refers to the variation in frequency or intensity over time, which helps prevent adaptation and increases the effectiveness of the therapy. Duration refers to the length of time the therapy is applied and can vary depending on the patient's condition and response.

259. Propagation of action potential: Action potential is the electrical signal that travels along the nerve fibers and is responsible for transmitting information throughout the body. The propagation of action potential occurs through a process called depolarization and repolarization. When a stimulus is applied to a nerve cell, it causes a change in the electrical charge across the cell membrane. This change in charge triggers the opening of voltage-gated ion channels, allowing the influx of sodium ions into the cell, resulting in depolarization. The depolarization spreads along the nerve fiber, causing adjacent voltage-gated ion channels to open and propagate the action potential. Once the action potential reaches its destination, repolarization occurs, restoring the electrical charge across the cell membrane.

260. Diadynamic currents: Diadynamic currents are a type of electrical stimulation therapy used in physiotherapy. They are low-frequency, pulsed currents that can be used to relieve pain, reduce muscle spasm, and improve circulation. There are four types of

diadynamic currents: DF (direct frequency), CP (continuous pulsation), LP (long pulsation), and RS (rectangular sweep). Each type of diadynamic current has different physiological effects and can be applied using various electrode placements and treatment durations.

261. Physics of Iontophoresis: Iontophoresis is a therapeutic technique that involves the introduction of ions into the body through the use of a direct electric current. It utilizes the principles of electromigration and electroosmosis to transport ions across the skin. Electromigration is the movement of ions in an electric field, where positively charged ions (cations) are attracted to the negative electrode (cathode) and negatively charged ions (anions) are attracted to the positive electrode (anode). Electroosmosis, on the other hand, is the movement of fluid due to the electric field. By applying a direct current, ions with therapeutic properties can be delivered into the underlying tissues, providing localized treatment for various conditions.

262. H-reflex: The H-reflex is a neurophysiological test used to assess the integrity and excitability of the spinal cord and peripheral nerves. It is a monosynaptic reflex that measures the electrical response of the muscle following a sensory stimulus. The H-reflex is elicited by stimulating a peripheral nerve that innervates the muscle and recording the electrical activity of the muscle using surface electrodes. The response is characterized by a small latency period, which represents the time it takes for the stimulus to travel from the sensory nerve to the motor neuron and back to the muscle. The H-reflex can provide valuable information about the function of the nervous system and is often used in the diagnosis and treatment of various neurological conditions.

263. Therapeutic uses of electricity: Electricity has various therapeutic uses in physiotherapy. Some of the common therapeutic uses include:

    - Pain management: Electrical stimulation can be used to relieve pain by stimulating the release of endorphins, blocking pain signals, and reducing muscle spasm.
    - Muscle re-education: Electrical stimulation can be used to stimulate weak or paralyzed muscles, helping to improve muscle strength, coordination, and function.
    - Edema reduction: Electrical stimulation can help reduce edema by promoting fluid movement and reabsorption.

- Wound healing: Electrical stimulation can enhance wound healing by increasing blood flow, promoting tissue regeneration, and reducing inflammation.
- Nerve stimulation: Electrical stimulation can be used to stimulate nerves and improve nerve function in conditions such as peripheral neuropathy.
- Bone healing: Electrical stimulation can aid in the healing of fractures and promote bone growth.

264. The types of valves used in electrotherapy units include the gate valve, butterfly valve, ball valve, globe valve, and needle valve. These valves are used to control the flow of electrical current in the unit.

265. The electromagnetic spectrum is a range of electromagnetic waves that includes radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X-rays, and gamma rays. Each type of wave has a different wavelength and frequency. The unit used to measure the electromagnetic spectrum is the hertz (Hz).

266. Modified A.C currents used in physiotherapy include faradic current, sinusoidal current, and Russian current. Faradic current is a high-frequency alternating current used for muscle stimulation. Sinusoidal current is a low-frequency alternating current used for pain relief and muscle stimulation. Russian current is a medium-frequency alternating current used for muscle strengthening.

267. Anodal galvanism is a form of electrotherapy that uses direct current with the positive electrode (anode) placed on the body. It is used to stimulate nerve and muscle tissues, promote tissue healing, and reduce pain and inflammation.

268. Various tests used in electrodiagnosis include nerve conduction studies, electromyography (EMG), and evoked potentials. Nerve conduction studies measure the speed and strength of electrical signals along nerves. EMG measures the electrical activity of muscles. Evoked potentials measure the electrical responses of the brain and spinal cord to specific stimuli.

269. Biofeedback is a technique used in physiotherapy to help individuals gain control over their physiological processes, such as heart rate, blood pressure, and muscle tension. It involves using sensors to monitor these processes and providing real-time feedback to the individual, allowing them to learn how to control and regulate their body's responses. Biofeedback is important in physiotherapy as it can help in the treatment of

various conditions, such as chronic pain, stress-related disorders, and muscle dysfunction.

270. Phonophoresis is a technique in which ultrasound waves are used to enhance the absorption of topical medications into the body. The ultrasound waves create micro-vibrations in the skin, increasing the permeability of the skin and allowing the medication to penetrate deeper. Phonophoresis is commonly used in the treatment of musculoskeletal conditions, such as tendonitis and bursitis.

271. IRR stands for Infrared Radiation. Physiological effects of IRR include increased blood flow, increased metabolism, pain relief, and relaxation of muscles. It is often used in physiotherapy for the treatment of musculoskeletal conditions, such as arthritis and muscle strains.

272. Ultrasound is produced by a transducer that converts electrical energy into sound waves. The transducer emits high-frequency sound waves that penetrate the body and create vibrations in the tissues. The dosimetry in ultrasound refers to the measurement and control of the intensity and duration of the ultrasound treatment. It is important to ensure that the ultrasound dosage is appropriate for the specific condition being treated and to avoid any potential adverse effects.

273. Contrast bath therapy involves alternating between hot and cold water immersion. It is used for the treatment of musculoskeletal conditions, such as sprains and strains. The indications for contrast bath therapy include pain relief, reduction of swelling, and improvement of circulation. The contraindications include open wounds, infections, and circulatory disorders.

274. The principles of wax bath therapy include using melted wax as a heat source, immersing the affected body part in the wax, and allowing the heat to penetrate the tissues. The wax bath provides a controlled and uniform heat distribution, promoting relaxation, pain relief, and increased blood flow to the treated area.

275. Applicators used in a MWD (Microwave Diathermy) unit include drum electrodes, condenser electrodes, and contact electrodes. Drum electrodes are used for large areas, condenser electrodes for deep tissues, and contact electrodes for specific areas. The uses of these applicators include pain relief, muscle relaxation, and tissue healing.

276. The benefits of cold packs usage include pain relief, reduction of swelling and inflammation, and numbing of the affected area. Cold packs are commonly used in the

treatment of acute injuries, such as sprains and strains. They help to decrease blood flow to the injured area and reduce tissue damage.

Interferential therapy is a type of electrotherapy that uses low-frequency electrical currents to relieve pain and promote healing. There are various types of electrode placements in interferential therapy, each with its own benefits and applications.

1. Monopolar Placement: In this placement, one electrode is placed on the target area, while the other electrode is placed on a distant location, typically on a larger muscle group. This configuration allows for a deeper penetration of the electrical current, making it suitable for treating deep-seated pain and musculoskeletal conditions.

2. Bipolar Placement: Here, both electrodes are placed on the target area, creating a circuit within the treatment area. This placement is commonly used for localized pain relief, such as in joint or muscle injuries. It provides a more concentrated and focused stimulation to the affected area.

3. Quadripolar Placement: This placement involves the use of four electrodes, with two electrodes placed on the target area and the other two placed on surrounding areas. Quadripolar placement is effective in providing wider coverage and stimulating a larger treatment area. It is commonly used for conditions that require a broader distribution of electrical stimulation, such as chronic pain or edema.

4. Crossed Placement: In this configuration, one pair of electrodes is placed diagonally across the target area, while the other pair is placed diagonally on the opposite side. Crossed placement allows for a crisscrossing of the electrical currents, resulting in a more uniform distribution of stimulation. It is often used for treating larger areas, such as the back or abdomen.

The choice of electrode placement in interferential therapy depends on the specific condition being treated, the depth of the target area, and the desired outcome. A qualified healthcare professional should determine the most appropriate electrode placement based on individual needs and treatment goals.

SHORT ANSWERS

1. The fuse in an electrotherapy unit is used to protect the device from electrical overloads or short circuits. It acts as a safety mechanism by breaking the circuit if excessive current flows through it.

2. A condenser, also known as a capacitor, is a passive electronic component that stores and releases electrical energy. It consists of two conductive plates separated by an insulating material, which allows it to store electric charge.

3. Interrupted galvanic current is commonly used in electrotherapy for muscle stimulation and pain relief. It can be used for muscle re-education and strengthening, as well as for reducing pain and inflammation.

4. Faradic current, also known as functional electrical stimulation, has two main features. Firstly, it produces muscle contractions through the application of electrical pulses. Secondly, it can be used for muscle rehabilitation and toning.

5. Cathodal galvanism refers to the therapeutic use of a direct current with the negative electrode (cathode) placed on the body. It is used to achieve specific physiological effects, such as muscle relaxation or pain relief.

6. The SD curve, also known as strength-duration curve, is used in electrotherapy to determine the optimal combination of pulse duration and intensity for effective stimulation. It helps in selecting appropriate parameters for different treatment goals, such as pain management or muscle stimulation.

7. Pulsed electromagnetic energy (PEME) refers to the application of pulsed electromagnetic fields for therapeutic purposes. It is used in various medical treatments, such as pain management, tissue repair, and bone healing.

8. A whirlpool bath is commonly used for hydrotherapy. It has two main uses: relaxation and physical therapy. The swirling water massage can help relieve muscle tension and promote relaxation. Additionally, it can be used for physical therapy exercises and rehabilitation.

9. Ohm's law states that the current flowing through a conductor is directly proportional to the voltage applied across it, and inversely proportional to the resistance of the conductor. It can be mathematically expressed as $I = V/R$, where I is the current, V is the voltage, and R is the resistance.

10. Nerve conduction velocity refers to the speed at which an electrical impulse travels along a nerve fiber. It is an important measure in diagnosing and monitoring various neurological conditions, as it can provide information about the health and functionality of the nerves.
11. Excitatory Cold is a term used to describe the sensation of feeling cold and being stimulated or excited by it.
12. The modalities commonly used for Ligament Injuries include ice therapy, compression therapy, elevation, and physical therapy exercises.
13. Scalds are burns caused by hot liquids or steam.
14. Contraplanar technique is a treatment method used for Osteoarthritis, where forces are applied in opposite directions to the affected joint to reduce pain and improve function.
15. Ice burn refers to a burn injury caused by prolonged exposure to extreme cold temperatures or ice.
16. An inductor is a device used in electrical circuits to store energy in a magnetic field.
17. The grid method is a technique used in physical therapy or rehabilitation to assess and treat movement dysfunctions by breaking down complex movements into smaller components.
18. Pressure sores, also known as bedsores or pressure ulcers, are injuries to the skin and underlying tissues caused by prolonged pressure or friction.
19. The piezo-electric effect is the generation of an electric charge in certain materials when subjected to mechanical stress or pressure.
20. A coupling medium is a gel or lotion used in ultrasound therapy to improve the transmission of sound waves between the ultrasound probe and the skin.
21. Magnetron - A device that generates microwaves for use in microwave ovens.
22. Crystal laser - A laser that uses a crystal as the gain medium, producing a coherent beam of light.
23. Crepe bandage - A stretchy bandage made of crepe fabric, used for compression and support.
24. Capacitor - An electronic component that stores and releases electrical energy.

25. Acne Vulgaris - A common skin condition characterized by the formation of pimples and blemishes.
26. Quantum theory - A branch of physics that explains the behavior of particles at the atomic and subatomic level.
27. Pulsed Mark: Space ratio - The ratio of the duration of the pulse to the time between pulses in a pulsed signal.
28. Modalities used for Tennis elbow - Various treatment methods used for relieving pain and promoting healing in tennis elbow, such as physical therapy, bracing, and medication.
29. Principle of phonophoresis - The use of ultrasound waves to enhance the absorption of topical medications into the skin.
30. Papules - Small, raised bumps on the skin, often caused by inflammation or infection.
31. Cryo stretch - A stretching technique that involves applying cold therapy to a muscle or joint before stretching.
32. Hydro collator pack - A pack filled with a gel-like substance that can be heated and applied to the body for therapeutic purposes.
33. Collimation - The process of aligning light rays or other forms of radiation into a parallel beam.
34. Psoriasis - A chronic skin condition characterized by red, scaly patches on the skin.
35. Erythema - Redness of the skin, often caused by inflammation or irritation.
36. Erythema: Redness of the skin caused by increased blood flow to the area.
37. Paraffin wax bath: A therapeutic treatment where the affected area is immersed in melted paraffin wax to provide heat and promote healing.
38. Dangers of laser: Potential risks associated with laser therapy, including eye damage, burns, and skin changes.
39. Moist heat therapy: Application of moist heat to the body to relieve pain, relax muscles, and promote healing.
40. Mono planar technique of short wave diathermy: A method of applying short wave diathermy where the electrodes are placed in a single plane.

41. Cold laser: Low-level laser therapy that uses low-intensity light to stimulate healing and reduce pain.
42. Fuse: A safety device that protects electrical circuits from overloading and overheating by breaking the circuit.
43. Magnetron: A device used in microwave diathermy machines to generate electromagnetic waves.
44. Test dose: A small amount of medication or treatment given to assess the patient's response or tolerance before administering a full dose.
45. Pulse repetition rate: The number of pulses of energy delivered per second in a pulsed treatment modality.
46. Grid: A device used to collimate or focus radiation in a specific area, reducing scatter and improving treatment accuracy.
47. Methods of application of ultrasound: Various techniques used to apply ultrasound therapy, including direct contact, underwater, and phonophoresis.
48. Phonophoresis: The use of ultrasound to enhance the absorption of topical medications through the skin.
49. Laws governing radiation: Regulations and guidelines that govern the safe use of radiation in therapeutic treatments.
50. Ulcer: A sore or wound that forms on the skin or mucous membranes, often due to poor circulation or pressure.
51. Electrode spacing in condenser field methods: The distance between electrodes used in condenser field therapy, which affects the depth and intensity of the treatment.
52. Coupling Media: A gel or lotion used to improve the transmission of ultrasound waves between the transducer and the patient's skin.
53. Thermostat: A device used to regulate and maintain a desired temperature in therapeutic modalities.
54. Types of HF current: High-frequency currents used in electrotherapy, including interferential current, Russian current, and diadynamic current.

55. Treatment duration of Tennis Elbow: The recommended length of time for treating tennis elbow with therapeutic modalities, typically ranging from a few weeks to several months.
56. Pulsed diathermy: A form of diathermy that delivers short bursts of high-frequency electromagnetic energy to heat deep tissues and promote healing.
57. Electromagnetic spectrum: The range of all possible frequencies of electromagnetic radiation, including radio waves, microwaves, infrared, visible light, ultraviolet, X-rays, and gamma rays.
58. Gamma rays: High-energy electromagnetic radiation that is often used in radiation therapy for cancer treatment.
59. Tridmyite formation: The formation of a type of crystalline silica mineral called tridymite, often associated with certain occupational lung diseases.
60. Therapeutic uses of IFT: Interferential therapy is used for pain relief, muscle stimulation, edema reduction, and promoting tissue healing.
61. Magnetron: A device used in microwave diathermy machines to generate electromagnetic waves.
62. PUVA regimen: A treatment regimen that combines psoralen (a medication that makes the skin more sensitive to light) with ultraviolet A (UVA) light therapy for various skin conditions.
63. Minimal erythmal dose: The lowest dose of ultraviolet radiation required to produce a noticeable redness or erythema on the skin.
64. Inverse square law: A principle stating that the intensity of radiation decreases with the square of the distance from the source.
65. Indications for UVR: Ultraviolet radiation therapy is used for various skin conditions, such as psoriasis, eczema, and vitiligo.
66. Techniques of application of UST: Various methods of applying ultrasound therapy, including continuous, pulsed, and combination techniques.
67. Indications and contraindications of moist heat packs: Moist heat packs are indicated for muscle pain, arthritis, and relaxation, but contraindicated for acute injuries, open wounds, and certain medical conditions.

68. Convection: The transfer of heat through the movement of fluids or gases, such as air or water.

69. Cryokinetics: A therapeutic technique that combines cold therapy with active movement and exercise to promote healing and reduce pain.

70. Physical properties of paraffin wax: Paraffin wax is a colorless, odorless solid that is derived from petroleum. It has a low melting point, typically between 46-68°C (115-154°F), which makes it easy to melt and use in various applications. Paraffin wax is known for its ability to retain heat for long periods of time, making it ideal for use in therapies such as paraffin wax baths. It is also insoluble in water and has a relatively low thermal conductivity.

71. Laws governing radiation: There are several laws that govern radiation, including:

    - Stefan-Boltzmann law, which states that the total energy radiated by a perfect black body is proportional to the fourth power of its absolute temperature.
    - Planck's law, which describes the spectral distribution of radiation emitted by a black body at a given temperature.
    - Wien's displacement law, which states that the wavelength at which the intensity of radiation emitted by a black body is maximum is inversely proportional to its absolute temperature.
    - Lambert's law, which relates the intensity of radiation to the thickness and absorption coefficient of a material.

72. Ultrasonic field: An ultrasonic field refers to a region where sound waves with frequencies higher than the upper limit of human hearing (typically above 20 kHz) are present. Ultrasonic waves are generated by ultrasonic transducers and can be used in various applications such as cleaning, medical imaging, and non-destructive testing. The ultrasonic field is characterized by high-frequency vibrations and can be focused or dispersed depending on the design of the transducers.

73. Diode valve: A diode valve, also known as a diode vacuum tube or simply a diode, is an electronic component that allows current to flow in only one direction. It consists of a cathode, an anode, and a vacuum-sealed enclosure. When a positive voltage is applied to the anode with respect to the cathode, current can flow through the diode. However, if a negative voltage is applied, the diode blocks the flow of current. Diode valves are commonly used in rectifier circuits and signal demodulation.

74. Indications of wax therapy: Wax therapy, also known as paraffin wax therapy, is a therapeutic technique that involves applying melted paraffin wax to the skin. It has various indications, including:

- Pain relief: Wax therapy can help alleviate pain associated with arthritis, joint stiffness, muscle tension, and certain injuries.
- Increased blood flow: The warmth from the wax can improve circulation and promote healing.
- Moisturization: Wax therapy can help moisturize and soften dry or rough skin.
- Relaxation: The heat and gentle pressure from the wax can induce relaxation and reduce stress.

75. Tuning in Short Wave Diathermy: Short wave diathermy is a therapeutic technique that uses high-frequency electromagnetic waves to generate heat deep within tissues. Tuning in short wave diathermy refers to adjusting the frequency of the electromagnetic waves to match the resonant frequency of the target tissue. This allows for maximum energy absorption and heating of the tissue. The tuning process typically involves adjusting the capacitors or inductors in the diathermy machine to achieve the desired frequency.

76. Indication for contrast bath: Contrast bath therapy is a technique that involves alternating immersion of a body part in warm and cold water. It is commonly used in the treatment of certain musculoskeletal conditions and injuries. The indications for contrast bath therapy include:

- Pain relief: The alternating warm and cold temperatures can help reduce pain and inflammation.
- Increased circulation: The contrast between warm and cold water promotes vasodilation and vasoconstriction, which can improve blood flow and aid in healing.
- Joint mobility: Contrast bath therapy can help improve joint mobility and flexibility.
- Edema reduction: The temperature changes can assist in reducing swelling and edema.

77. Cryo cuff: A cryo cuff is a type of cold therapy device that is commonly used in the treatment of acute injuries and post-surgical recovery. It consists of a cuff or wrap that

is filled with cold water or ice, along with a pump system that circulates the cold fluid. The cryo cuff provides controlled and consistent cold therapy to the affected area, helping to reduce pain, inflammation, and swelling. It is often used in sports medicine, orthopedics, and physical therapy.

78. Pressure sore: A pressure sore, also known as a pressure ulcer or bed sore, is a localized injury to the skin and underlying tissues that occurs due to prolonged pressure or friction. Pressure sores typically develop in areas where the skin is in contact with a bony prominence, such as the buttocks, heels, hips, or back. They can range in severity from mild redness to deep wounds that extend into the muscle or bone. Pressure sores are common in individuals who are bedridden, wheelchair-bound, or have limited mobility.

79. Alopecia areata: Alopecia areata is an autoimmune condition that causes hair loss in patches on the scalp, face, or body. It occurs when the immune system mistakenly attacks the hair follicles, leading to hair loss. The exact cause of alopecia areata is unknown, but it is believed to involve a combination of genetic, environmental, and immune factors. The condition can be unpredictable, with periods of hair loss followed by periods of regrowth. Treatment options for alopecia areata include topical medications, injections, and systemic therapies.

80. Sensitizers: Sensitizers, in the context of dermatology, refer to substances that can cause an allergic or hypersensitivity reaction in the skin. These substances are known as allergens and can include various chemicals, metals, fragrances, and plant extracts. When a sensitized individual comes into contact with a specific allergen, their immune system reacts, leading to symptoms such as itching, redness, swelling, and rash. Sensitizers are commonly identified through patch testing, which involves applying small amounts of potential allergens to the skin and monitoring for reactions.

81. PUVA regimen: PUVA (psoralen plus ultraviolet A) is a phototherapy treatment used for certain skin conditions, such as psoriasis, eczema, and vitiligo. The PUVA regimen involves a combination of a photosensitizing medication called psoralen and exposure to UVA radiation. Psoralen is either applied topically or taken orally, and it makes the skin more sensitive to UVA light. After psoralen administration, the patient is exposed to UVA radiation in a specialized phototherapy booth. PUVA therapy helps to reduce

inflammation, suppress the immune system, and promote repigmentation in conditions like vitiligo.

82. Lewis hunting reaction: The Lewis hunting reaction, also known as the Lewis response, is a physiological response that occurs in the blood vessels when they are subjected to a sudden increase or decrease in pressure. It is named after the British physiologist Thomas Lewis, who first described the phenomenon. The Lewis hunting reaction involves the rhythmic oscillation of blood vessel diameter in response to changes in pressure, resulting in variations in blood flow. This response is thought to play a role in regulating blood flow and maintaining vascular homeostasis.

83. Electrostatic field: An electrostatic field, also known as an electric field, is a region in space where electrically charged particles experience a force. It is created by electric charges, either positive or negative, and is characterized by the strength and direction of the force exerted on other charged particles. The strength of the electrostatic field is determined by the magnitude of the charges and their separation distance. Electrostatic fields are fundamental to the study of electromagnetism and have various applications in technology, such as in capacitors, electric motors, and particle accelerators.

84. Reverse piezoelectric effect: The piezoelectric effect refers to the ability of certain materials to generate an electric charge in response to applied mechanical stress or pressure. The reverse piezoelectric effect, also known as the inverse piezoelectric effect, is the opposite phenomenon, where an electric field applied to a piezoelectric material causes it to deform or change shape. This effect is utilized in various devices, such as piezoelectric actuators, sensors, and ultrasound transducers.

85. Nodes and antinodes: In the context of wave motion, nodes and antinodes refer to specific points along a wave where the amplitude or displacement is either zero or maximum, respectively. Nodes are the points where the wave undergoes destructive interference, resulting in zero displacement. Antinodes, on the other hand, occur where the wave undergoes constructive interference, leading to maximum displacement. The distribution of nodes and antinodes depends on the frequency, wavelength, and boundary conditions of the wave.

86. Cavitation: Cavitation refers to the formation and collapse of small vapor-filled cavities or bubbles in a liquid due to rapid changes in pressure. It occurs when the pressure in a liquid drops below its vapor pressure, causing the liquid to boil and form bubbles.

These bubbles then collapse, creating shock waves and high-energy events that can cause damage to nearby surfaces. Cavitation is a common phenomenon in various applications, such as ultrasonic cleaning, hydraulic systems, and propeller design.

87. Pigmentation: Pigmentation refers to the coloration of the skin, hair, or other tissues due to the presence of pigments. Pigments are natural substances that absorb or reflect certain wavelengths of light, giving tissues their characteristic color. The most common pigment in humans is melanin, which is responsible for the range of skin, hair, and eye colors. Changes in pigmentation can occur due to various factors, such as genetics, sun exposure, hormonal changes, and certain medical conditions.

88. Super luminous diode laser: A super luminous diode (SLD) laser is a type of laser diode that emits coherent light with a broad spectrum of wavelengths. Unlike traditional laser diodes, which emit light at a single wavelength, SLD lasers produce a range of wavelengths simultaneously. This makes them useful for applications such as medical imaging, optical coherence tomography (OCT), and fiber optic communications. SLD lasers are known for their high brightness, efficiency, and reliability.

89. Quick ice: Quick ice, also known as cryotherapy or ice therapy, is a therapeutic technique that involves applying ice or a cold pack to a specific area of the body. It is commonly used to reduce pain, inflammation, and swelling associated with acute injuries, such as sprains, strains, and bruises. Quick ice works by constricting blood vessels, numbing the area, and reducing metabolic activity, which can help alleviate pain and promote healing. It is often used in conjunction with rest, elevation, and compression (RICE) for optimal recovery.

90. Classification of LASERS: LASER stands for Light Amplification by Stimulated Emission of Radiation. Lasers can be classified based on various criteria, including the medium used to generate the laser beam, the type of pumping mechanism, and the output characteristics. Some common classifications include:

    - Solid-state lasers: These lasers use a solid material, such as a crystal or glass, as the laser medium.
    - Gas lasers: These lasers use a gaseous medium, such as carbon dioxide or helium-neon, to generate the laser beam.
    - Semiconductor lasers: Also known as diode

91. Mark: Space Ratio refers to the ratio of the time that an ultrasound wave is on (active) to the time it is off (inactive) during a treatment session.

92. Depth of penetration of Ultrasound Therapy is the distance that ultrasound waves can travel into the body tissues. It depends on factors such as frequency and intensity of the ultrasound waves.

93. Frequency refers to the number of cycles or vibrations of a wave that occur in one second. In the context of ultrasound therapy, it refers to the number of ultrasound waves produced per second.

94. Dangers of Infrared radiation include the potential for burns if the radiation is too intense or if the exposure is prolonged. It can also cause damage to the eyes if proper eye protection is not used.

95. Physical properties of wax include its melting point, viscosity, and thermal conductivity. These properties determine how the wax behaves and how it can be used in various applications.

96. The wavelength of lasers refers to the distance between two consecutive peaks or troughs of the laser light wave. It is typically measured in nanometers (nm).

97. Cryokinetics is a therapeutic technique that combines cold therapy (cryotherapy) and active exercise. It is commonly used in the rehabilitation of sports injuries.

98. Conduction is the transfer of heat or electricity through a material or between objects that are in direct contact with each other.

99. Puva apparatus is a medical device used in the treatment of certain skin conditions, such as psoriasis. It combines the use of psoralen, a photosensitizing medication, with ultraviolet A (UVA) light therapy.

100. Duty cycle refers to the ratio of the time that a device or system is active (on) to the total time of a complete cycle. In the context of ultrasound therapy, it refers to the amount of time that ultrasound waves are on during a treatment session.

101. The wavelength of Ultraviolet rays B (UVB) ranges from 280 to 320 nanometers (nm). UVB rays are responsible for causing sunburn and can contribute to the development of skin cancer.

102. Triode valve, also known as a vacuum tube or electron tube, is an electronic device that consists of three electrodes: a cathode, an anode, and a control grid. It is used to amplify or switch electronic signals.

103. Phonophoresis is a therapeutic technique that combines ultrasound therapy with the topical application of medication. The ultrasound waves enhance the absorption of the medication into the underlying tissues.

104. Damping of oscillations refers to the gradual decrease in the amplitude or intensity of oscillations over time. It is often desirable to dampen oscillations to reduce unwanted vibrations or noise.

105. Lasing medium is the material or substance used in a laser system that amplifies and emits coherent light. It can be a solid, liquid, or gas, depending on the type of laser.

106. Piezo-electric effect is the generation of an electric charge or voltage in certain materials when subjected to mechanical stress or pressure. It is commonly used in ultrasound transducers to convert electrical energy into ultrasound waves.

107. Desquamation refers to the shedding or peeling of the outermost layer of the skin. It can occur naturally as part of the skin renewal process or as a result of certain skin conditions or treatments.

108. Four methods of application of paraffin wax include dipping, brushing, wrapping, and spraying. These methods are used to apply a thin layer of melted paraffin wax onto the skin for therapeutic purposes.

109. Ice towel method is a technique used to provide cold therapy by applying a towel soaked in ice water to the affected area. It helps reduce pain, swelling, and inflammation.

110. Coupling medium is a substance or gel used to improve the transmission of ultrasound waves between the ultrasound transducer and the skin. It helps reduce air gaps and improve the efficiency of ultrasound therapy.

111. Eddy currents are circulating currents that are induced in a conductor when it is exposed to a changing magnetic field. They can cause energy loss and heating in electrical devices.

112. The method of application of SWD (Shortwave Diathermy) involves using electromagnetic waves to generate heat deep within the body tissues for therapeutic purposes.
113. Magnetron is a device used to generate microwave radiation in microwave ovens and other applications.
114. An oscillator circuit is an electronic circuit that generates a continuous periodic waveform, such as a sine wave or a square wave.
115. Photo sensitization refers to the process of sensitizing a material or substance to react to light or other forms of electromagnetic radiation.
116. A triode valve, also known as a vacuum tube or a thermionic valve, is an electronic device used to amplify or switch electronic signals.
117. Latent heat of fusion is the amount of heat energy required to change a substance from a solid to a liquid state without changing its temperature.
118. Parameters of ultrasound refer to the various characteristics or properties of ultrasound waves, such as frequency, intensity, wavelength, and speed.
119. Eddy currents are circulating currents induced in conductive materials when exposed to a changing magnetic field.
120. Plantar warts are warts that develop on the soles of the feet, caused by the human papillomavirus (HPV).
121. A thermostat is a device that controls the temperature of a system or environment by sensing and regulating the heat or cooling source.
122. Vapocoolant spray is a type of topical spray used for pain relief or numbing by rapidly cooling the skin upon application.
123. Power density of laser refers to the amount of power per unit area of laser beam, typically measured in watts per square meter.
124. Buoyancy is the upward force exerted by a fluid (such as water) on an object immersed or floating in it, counteracting the force of gravity.
125. Actinotherapy refers to the therapeutic use of ultraviolet radiation or other forms of radiant energy for medical purposes.

126. The inverse square law states that the intensity of a physical quantity decreases with the square of the distance from the source.
127. A transducer is a device that converts one form of energy into another, such as converting electrical energy into sound waves in ultrasound imaging.
128. Ionization refers to the process of removing or adding electrons to an atom or molecule, resulting in the formation of ions.
129. An ice burn is a type of injury caused by prolonged exposure to extreme cold temperatures, which can damage the skin and underlying tissues.
130. UVR new dose calculation formula refers to a formula used to calculate the appropriate dosage of ultraviolet radiation for therapeutic purposes.
131. Variable condense may refer to a term used in physics or chemistry that describes the ability of a substance to change from a gas to a liquid state under varying conditions.
132. Conduction is the transfer of heat or electricity through a medium or material, typically through direct contact or collisions between particles.
133. Some techniques of application of LASER include laser surgery, laser therapy for pain management, laser hair removal, and laser eye surgery.
134. To prevent damage to a magnetron, it is important to avoid operating the device without a load, avoid arcing or sparking, and ensure proper ventilation and cooling.
135. Ultraviolet radiation is converted into vitamin D in the skin through a process called photolysis, where a precursor molecule is broken down by UV light.
136. The cosine law, also known as the law of cosines, is a mathematical formula used to calculate the length of a side or the measure of an angle in a triangle.
137. The depth of penetration of ultrasound therapy refers to how far the ultrasound waves can travel into the body tissues, which can vary depending on the frequency and intensity of the ultrasound.
138. The wavelength of infrared radiation falls within the range of electromagnetic waves longer than visible light, typically between 700 nanometers and 1 millimeter.
139. Frequency is a measure of how often a particular event or phenomenon occurs per unit of time, often measured in hertz (Hz).

140. Cryostretch refers to a therapeutic technique that combines cryotherapy (cold therapy) with stretching exercises to promote healing and flexibility in injured tissues.
141. A hydrocollator pack is a moist heat pack used in physical therapy to apply heat to specific areas of the body for pain relief and relaxation of muscles.
142. Cavitation refers to the formation and subsequent collapse of tiny bubbles in a liquid, often caused by high intensity ultrasound waves, which can have therapeutic applications.
143. Convection and radiation are two methods of heat transfer. Convection involves the movement of heat through a fluid, such as air or water, while radiation involves the emission and absorption of electromagnetic waves.
144. An electrostatic field refers to the distribution of electric charges in a given space, which creates an electric field that can exert forces on other charged objects.
145. Desquamation is the natural process of shedding or sloughing off dead skin cells from the outermost layer of the skin.
146. The piezo-electric effect refers to the phenomenon where certain materials, such as quartz or certain ceramics, generate an electric charge when subjected to mechanical stress or pressure.
147. Cryokinetics is a therapeutic technique that combines cryotherapy (cold therapy) with active exercise to promote healing, reduce pain, and improve range of motion.
148. Electric shock refers to the physiological reaction or injury caused by the passage of an electric current through the body, which can range from mild discomfort to severe burns or cardiac arrest.
149. A coupling medium is a substance or gel used to improve the transmission of energy between a transducer and the skin during ultrasound imaging or therapy.
150. A thermostat is a device that automatically regulates temperature by sensing changes and activating heating or cooling systems to maintain a desired temperature.
151. RICE is an acronym that stands for Rest, Ice, Compression, and Elevation, which are commonly recommended treatments for acute injuries to reduce pain and swelling.
152. Moist heat is a therapeutic modality that involves the use of moist heat packs or hot water to provide heat therapy to a specific area of the body.

153. Erythema refers to the redness of the skin that occurs as a result of increased blood flow to the area. It is a common response to heat, inflammation, or injury.

154. Cold laser therapy, also known as low-level laser therapy, is a non-invasive treatment that uses low-intensity lasers to stimulate healing and reduce pain and inflammation.

155. Cavitation is a phenomenon that occurs when low-frequency ultrasound waves create tiny bubbles in a liquid, which then collapse and produce localized heat and pressure. It is commonly used in physical therapy for deep tissue massage.

156. Near field and far field refer to the regions around an electromagnetic radiation source. Near field is the region close to the source, while far field is the region further away. These terms are often used in the context of electromagnetic therapy.

157. Microwave diathermy is a form of electromagnetic therapy that uses microwaves to generate heat deep within the body tissues. It is commonly used to treat musculoskeletal conditions.

158. Eddy currents are circulating currents that are induced in a conductor when it is exposed to a changing magnetic field. They can generate heat and are used in some forms of electromagnetic therapy.

159. Refraction is the bending of light or other electromagnetic waves as they pass from one medium to another with different optical properties. It is a phenomenon that occurs in various therapeutic modalities, such as ultrasound and laser therapy.

160. The inverse square law states that the intensity of radiation decreases in proportion to the square of the distance from the source. It is a fundamental principle in radiation therapy and other applications of electromagnetic radiation.

161. The monopolar technique of shortwave diathermy involves the use of one electrode as the active electrode and the other electrode as the dispersive electrode. It is a method commonly used in the application of shortwave diathermy.

162. The distance between an ultraviolet lamp and a patient is typically calculated based on the manufacturer's guidelines and the specific treatment being performed. It may take into account factors such as the desired intensity of the ultraviolet radiation and the recommended exposure time.

163. Degrees of erythema refer to the severity or intensity of the redness of the skin. It is often used to classify the response of the skin to certain stimuli, such as heat or radiation.

164. X-rays and gamma rays are forms of ionizing radiation that can penetrate through the body tissues. They are commonly used in medical imaging and radiation therapy.

165. Radiant energy refers to energy that is transmitted in the form of electromagnetic waves or particles. It includes various forms of energy, such as heat, light, and radiation.

166. Convection is the transfer of heat through the movement of a fluid, such as air or water. It plays a role in various therapeutic modalities, such as hydrotherapy and thermotherapy.

167. Calories are a unit of energy commonly used to measure the energy content of food. In the context of physical therapy, calories may refer to the energy expenditure or energy requirements of the body during various activities.

168. Coupling media are substances or gels used to improve the transmission of ultrasound waves between the ultrasound transducer and the patient's skin. They help to reduce air gaps and improve the efficiency of the ultrasound therapy.

169. Cavitation can be of two types: stable and transient. Stable cavitation occurs when small gas bubbles oscillate in size but do not collapse. Transient cavitation occurs when gas bubbles rapidly expand and then collapse, generating shockwaves and localized heat.

170. Laser therapy is a form of electromagnetic therapy that uses focused light of a specific wavelength to stimulate healing and reduce pain and inflammation. Laser beams have specific properties, such as coherence and monochromaticity, that make them suitable for therapeutic applications.

171. The basic principle in treating sprains is the RICE method, which stands for Rest, Ice, Compression, and Elevation. This approach helps to reduce inflammation, control pain, and promote healing in sprained joints or ligaments.

172. Eddy currents are circulating currents that are induced in a conductor when it is exposed to a changing magnetic field. They can generate heat and are used in some forms of electromagnetic therapy.

173. A magnetron is a device that generates microwave radiation. It is commonly used in microwave diathermy machines to produce the microwaves used for therapeutic purposes.

174. Phonophoresis is a technique that involves the application of ultrasound waves to enhance the absorption of topical medications into the body tissues. Common drugs used in phonophoresis include corticosteroids and nonsteroidal anti-inflammatory drugs (NSAIDs).

175. The skin is the largest organ of the body and consists of three main layers: the epidermis, dermis, and hypodermis. It serves as a protective barrier and plays a role in sensory perception, temperature regulation, and fluid balance.

176. The carpal tunnel is a narrow passageway in the wrist that houses the median nerve and several tendons. Compression or inflammation of the median nerve in the carpal tunnel can cause symptoms such as pain, numbness, and tingling in the hand and fingers.

177. Erythema refers to the redness of the skin that occurs as a result of increased blood flow to the area. It is a common response to heat, inflammation, or injury.

178. Shortwave diathermy can have potential dangers, including burns, electrical shock, and interference with electronic devices. It should be used with caution and under the guidance of a trained healthcare professional.

179. LASER stands for Light Amplification by Stimulated Emission of Radiation. It is a device that emits focused and coherent light of a specific wavelength, which can be used for various therapeutic and medical applications.

180. Physical properties of wax can include its melting point, viscosity, thermal conductivity, and ability to retain heat. These properties make wax suitable for use in various therapeutic modalities, such as hot wax therapy.

181. Cryotherapy, or the use of cold therapy, may have certain contraindications, such as cold intolerance, Raynaud's disease, and certain circulatory disorders. It is important to consider these contraindications before applying cryotherapy to a patient.

182. Latency refers to the delay or time lag between the initiation of a stimulus and the response or reaction to that stimulus.

183. Electromyography (EMG) is a diagnostic technique that involves the recording and evaluation of the electrical activity produced by skeletal muscles. It is commonly used to assess muscle function and diagnose neuromuscular disorders.

184. Biofeedback is a technique that involves measuring and providing feedback on physiological processes, such as heart rate or muscle tension, with the goal of helping individuals gain control over these processes. It is used in various fields, including healthcare, sports training, and stress management.

185. Sinusoidal current refers to an alternating current (AC) waveform that resembles a sine wave. It is commonly used in electrical stimulation therapies and has a smooth, continuous flow of current.

186. Resting membrane potential is the electrical potential difference across the cell membrane of a resting or non-excited cell. It is typically negative, with the inside of the cell being more negative compared to the outside.

187. Factors affecting accuracy of strength-duration curve include electrode placement, skin resistance, muscle fiber characteristics, and individual variations in nerve excitability.

188. The shape of interrupted galvanic current can vary depending on the specific parameters set, such as pulse duration, frequency, and duty cycle. It can be rectangular, triangular, or trapezoidal in shape.

189. Dangers of Iontophoresis include skin irritation or burns if the current intensity or duration is too high, allergic reactions to the medication being delivered, and potential interactions with other medications or medical conditions.

190. Motor point refers to the specific location on the surface of a muscle where the electrical stimulation can produce the most effective contraction of that muscle.

191. The ions commonly used in Iontophoresis include positively charged ions (e.g., calcium, magnesium) and negatively charged ions (e.g., chloride, iodine). The specific ion used depends on the desired therapeutic effect.

192. Capacitance refers to the ability of a device or material to store an electrical charge. It is measured in farads (F) and is often used in electronic circuits and systems.

193. The principles of biofeedback include the concepts of self-regulation, awareness, and feedback. It involves teaching individuals to become aware of and control their physiological processes through the use of feedback signals.

194. Semiconductors are materials that have electrical conductivity between that of a conductor and an insulator. They are commonly used in electronic devices, such as transistors and diodes.

195. Chronaxie is the minimum duration of an electrical stimulus required to produce a response from a tissue or cell at twice the rheobase intensity. It is used to evaluate the excitability of nerves and muscles.

196. A fuse is a device used to protect electrical circuits from excessive current. It contains a metal wire that melts and breaks the circuit when the current exceeds a certain level, thereby preventing damage to the circuit or equipment.

197. Motor point refers to the specific location on a muscle where the motor nerve supplying that muscle is most easily stimulated. Motor unit refers to a motor neuron and the muscle fibers it innervates.

198. Classification of Nerve Injury includes different types, such as neurapraxia (temporary loss of nerve function), axonotmesis (nerve damage with intact connective tissue), and neurotmesis (complete nerve transection).

199. Stimulation of denervated muscle refers to the use of electrical stimulation to activate muscles that have lost their nerve supply. It can help maintain muscle mass and prevent muscle atrophy.

200. Ohm's law states that the current flowing through a conductor is directly proportional to the voltage applied across it and inversely proportional to the resistance of the conductor. It is expressed by the equation $I = V/R$.

201. Checking of apparatus for Electrical muscle stimulation involves ensuring that all connections are secure, electrodes are properly placed, appropriate settings are selected (e.g., intensity, frequency), and the device is functioning correctly.

202. A diode valve, also known as a diode, is an electronic component that allows current to flow in only one direction. It is commonly used in rectifier circuits and signal processing.

203. H reflex is an electrical phenomenon observed in electromyography (EMG) that represents the electrical response of a muscle to a sensory stimulus. It is used to assess the integrity of the sensory and motor pathways.

204. A feedback loop refers to a system in which the output or result of a process is used to modify or regulate the input or initial condition of the process. It is commonly used in control systems to maintain stability and achieve desired outcomes.

205. Mutual induction refers to the process by which a changing magnetic field in one coil induces a voltage or current in a nearby coil. It is the basis for the operation of transformers and inductive coupling.

206. The ions commonly used in Iontophoresis include positively charged ions (e.g., calcium, magnesium) and negatively charged ions (e.g., chloride, iodine). The specific ion used depends on the desired therapeutic effect.

207. Resistance in series and parallel refers to how resistors are connected in an electrical circuit. In series, resistors are connected end-to-end, and the total resistance is the sum of individual resistances. In parallel, resistors are connected side-by-side, and the total resistance is less than the smallest individual resistance.

208. Nerve conduction tests are diagnostic tests that measure the speed and strength of electrical signals as they travel along nerves. They are used to assess nerve function and diagnose conditions such as peripheral neuropathy or carpal tunnel syndrome.

209. The type of TENS (Transcutaneous Electrical Nerve Stimulation) used for acute pain is typically high-frequency or conventional TENS. It involves the use of low-intensity electrical impulses to stimulate the nerves and help alleviate pain.

210. Dangers of Iontophoresis include skin irritation or burns if the current intensity or duration is too high, allergic reactions to the medication being delivered, and potential interactions with other medications or medical conditions.

211. Lenz's law states that the direction of an induced current in a conductor will be such that it opposes the change that produced it. It is based on the principle of conservation of energy and is used to explain the behavior of electromagnetic induction.

212. Types of electric current include direct current (DC), which flows in one direction, and alternating current (AC), which periodically reverses direction. Other types include pulsating current, interrupted current, and surge current.

213. Ions are electrically charged particles that are formed when atoms gain or lose electrons. They can be positively charged (cations) or negatively charged (anions) and play important roles in various biological and chemical processes.

214. Maximum voluntary isometric contraction (MVIC) refers to the maximum force that a muscle can generate during a voluntary, static contraction while maintaining a fixed joint position. It is often used as a reference point for evaluating muscle strength.

215. Orthodromic conduction refers to the normal conduction of an electrical impulse along a nerve fiber in the direction of its natural flow, from the cell body to the axon terminals. It is the usual mode of conduction in healthy nerves.