



HBB-9007

Seat No. _____

Second Year B. Physiotherapy Examination

August - 2017

Electrotherapy - I

Time : 3 Hours]

[Total Marks : 100

SECTION - I

- 1** Write in detail : (any **two**) **10×2=20**
- (a) Discuss in detail about the production of UVR.
 - (b) Discuss the various therapeutic effects of LASER in detail.
 - (c) Discuss the various physiological effects of therapeutic ultrasound.
- 2** Write in brief : (any **two**) **5×2=10**
- (a) What are the effects of superficial heat on tissues ?
 - (b) Contraindications to cryotherapy.
 - (c) Write a brief note on phonophoresis.
- 3** Answer in brief : (any **five**) **2×5=10**
- (a) Define the Beam Nonuniformity Ratio for ultrasound.
 - (b) Composition of paraffin wax.
 - (c) What is contrast bath method ?
 - (d) How to calculate energy density for LASER application ?
 - (e) Name 3 chemicals that acts as a sensitizer to UVR.
 - (f) Name two indications for UVR.
- 4** Multiple choice question : **1×10=10**
- (a) The law that tells about the direct relationship of the metabolic rate to increase in tissue temperature is :
 - (i) Joule's law
 - (ii) Vant Hoff's law
 - (iii) Grotthus law
 - (iv) Eddy's law
 - (b) The term diathermy means -
 - (i) Superficial heating
 - (ii) Deep heating
 - (iii) Through and through heating
 - (iv) None of the above

- (c) While applying SWD by inductive method to treat structures of high impedance, the part of cable used is :
- (i) Middle of the cable
 - (ii) The spiral coil
 - (iii) Both ends and middle of the cable
 - (iv) Ends of the cable
- (d) Choose the correct statement.
- (i) Dry heat causes strong superficial heating while moist heat causes deep heating
 - (ii) Moist heat causes strong superficial heating while dry heat causes deep heating
 - (iii) Both causes strong deep heating
 - (iv) None of the above is true
- (e) Heliotherapy is treatment by -
- (i) Natural sunlight
 - (ii) Russian current
 - (iii) Diadynamic current
 - (iv) Mud packs
- (f) The following statements regarding coupling medium used with ultrasound are true except -
- (i) transmission of US by aquasonic gel is 40%
 - (ii) a gel is ideal coupling medium
 - (iii) it helps in transmission of ultrasound
 - (iv) to eliminate air between transducer head and the patient
- (g) LASER promotes wound healing by -
- (i) Cell proliferation
 - (ii) Increase in RNA production
 - (iii) Increase in collagen formation
 - (iv) All of the above
- (h) Optimal temperature of cold pack is between -
- (i) 10 to 15 degree Celsius
 - (ii) -10 to 15 degree Celsius
 - (iii) 5 to 10 degree Celsius
 - (iv) -5 to 0 degree Celsius
- (i) The wavelength of UVA is -
- (i) 280nm - 315nm
 - (ii) 260nm - 280nm
 - (iii) 315nm - 400nm
 - (iv) 220nm - 260nm
- (j) The lives of fluorescent tubes are limited to -
- (i) 1000 hours
 - (ii) 500 hours
 - (iii) < 500 hours
 - (iv) None of the above

SECTION - II

- 5 Write in detail : (any **two**) **10×2=20**
- (a) How does the position, size and spacing of electrodes affect the heating pattern when using capacitor field method of SWD ?
 - (b) Discuss the effect of high frequency currents on tissues.
 - (c) Discuss the indications and contraindications of microwave diathermy.
- 6 Write in brief : (any **two**) **5×2=10**
- (a) Note on different types of electrodes used for application of SWD
 - (b) Therapeutic effects of pulsed SWD
 - (c) Difference between luminous and non luminous IR generators.
- 7 Answer in brief : (any **five**) **2×5=10**
- (a) Classification of IR radiation.
 - (b) Inductothermy.
 - (c) Types of Emitters of microwave.
 - (d) Cosine law.
 - (e) Cross fire method in SWD.
 - (f) Enumerate causes of electric shock.
- 8 Multiple choice questions : **1×10=10**
- (a) Tissues of high collagen content are affected to a greater extent by ultrasound energy. Which tissue would you expect to absorb the most ultrasound energy ?
 - (i) Bone
 - (ii) Muscle
 - (iii) Tendon
 - (iv) Skin
 - (b) Which of the statement for luminous IR is false ?
 - (i) Luminous IR is considered for acute conditions
 - (ii) Luminous IR penetrated deeper than non luminous
 - (iii) Luminous IR is produced with visible radiation
 - (iv) None of the above
 - (c) Which of the following modality has the maximum frequency ?
 - (i) Ultrasound waves
 - (ii) MWD waves
 - (iii) SWD waves
 - (iv) Infrared waves

- (d) In a condenser the spacing material should have -
- (i) High dielectric constant
 - (ii) Low dielectric constant
 - (iii) Both (i) and (ii)
 - (iv) None of the above
- (e) A 55 year old female diagnosed with a right hip intertrochanteric fracture is eight weeks status post open reduction and internal fixation with a plate and pinning. The patient has pain with active knee flexion and abduction. Acceptable modalities for this patient would include all of the following except -
- (i) Hot packs
 - (ii) Whirlpool
 - (iii) Pulsed ultrasound
 - (iv) Shortwave diathermy
- (f) In contrast bath the period of immersion in hot and cold bath is as -
- (i) 30 secs hot water, 10 secs cold water
 - (ii) 10 secs hot water, 30 secs cold water
 - (iii) 3-4 mins hot water, 1 min cold water
 - (iv) 1 min hot water, 3-4 mins cold water
- (g) A patient rehabilitating from a lower extremity injury is referred to physical therapy for hydrotherapy treatment. The therapist would like to fully extend the involved lower extremity while in hydrotherapy tank. Which type of whirlpool will not allow the patient to extend the lower extremity ?
- (i) Hubbard tank
 - (ii) Highboy tank
 - (iii) Lowboy tank
 - (iv) Walk tank
- (h) The unidirectional flow of the tissue component as a result of ultrasonic beam is called -
- (i) Cavitation
 - (ii) Attenuation
 - (iii) Absorption
 - (iv) Acoustic streaming
- (i) Strong superficial heating relieves pain by -
- (i) Counter irritation
 - (ii) Increased blood supply
 - (iii) Muscle relaxation
 - (iv) Increased metabolic rate
- (j) Therapeutically eddy current is used to -
- (i) Produce heat
 - (ii) Produce nerve stimulation
 - (iii) Apply drugs in iontophoresis
 - (iv) None of the above