



UNIVERSITI KUALA LUMPUR
ROYAL COLLEGE OF MEDICINE PERAK

FINAL EXAMINATION
MARCH 2026 SEMESTER

COURSE CODE : RFB10403
COURSE NAME : ELECTROTHERAPEUTIC MODALITIES 1
PROGRAMME NAME : BACHELOR OF PHYSIOTHERAPY (HONOURS)
DATE : 2 JULY 2026
TIME : 9.00 AM – 11.00 AM
DURATION : 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read CAREFULLY the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of TWO (2) sections; Section A and Section B.
4. Answer ALL questions in Section A and THREE (3) questions in Section B; Question 1 and Question 2 are COMPULSORY.
5. Please mark/write your answers on the OMR answer script and answer booklet provided.
6. Answer all questions in English language ONLY.

THERE ARE 8 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 20 marks)

I) MULTIPLE CHOICE QUESTIONS (20 marks)

INSTRUCTION: Answer ALL questions.

Please use the OMR sheet provided.

1. How is electrotherapy defined in a medical context?
 - A. The use of mechanical traction for joint health.
 - B. The use of exercise to improve muscle strength.
 - C. The application of manual massage to soft tissues.
 - D. The use of electrical energy as a medical treatment.
 - E. The use of sound waves to visualize internal organs.
2. Identify the category of modality for traction.
 - A. Sound.
 - B. Thermal.
 - C. Mechanical.
 - D. Electromagnetic.
 - E. Electrical current.
3. Identify the stage of pain perception where harmful stimuli are converted into electrical signals.
 - A. Perception.
 - B. Modulation.
 - C. Transduction.
 - D. Transmission.
 - E. Interpretation.
4. Find the brain structure responsible for emotional response to pain.
 - A. Thalamus.
 - B. Brainstem.
 - C. Cerebellum.
 - D. Limbic system.
 - E. Somatosensory cortex.

5. Select the situation that demonstrates peripheral sensitization.
- A. Pain decreases after rest.
 - B. Deep pressure blocks pain transmission.
 - C. Muscle contraction increases joint stability.
 - D. Light touch over injured tissue produces pain.
 - E. Sharp pain disappears immediately after injury.
6. Identify the mechanism that closes the pain gate in the spinal cord.
- A. Activation of C fibers.
 - B. Activation of nociceptors.
 - C. Stimulation of A-beta fibers.
 - D. Increased release of Substance P.
 - E. Increased transmission of pain signals.
7. Select the statement that explains the central biasing theory of pain.
- A. Pain depends only on tissue injury severity.
 - B. Pain is determined mainly by muscle tension.
 - C. Pain occurs only after activation of nociceptors.
 - D. Pain transmission occurs only at the spinal cord level.
 - E. Pain perception is influenced by emotional and cognitive factors.
8. Find the myotome that is innervated by S2 nerve root.
- A. Soleus.
 - B. Hamstring.
 - C. Quadriceps.
 - D. Gastrocnemius.
 - E. Pectoralis major.
9. Identify the nerve root responsible for wrist flexion.
- A. C6.
 - B. C7.
 - C. T2.
 - D. T3.
 - E. T4.

10. Find the type of heat transfer used in hydrocollator pack therapy.
 - A. Radiation.
 - B. Reflection.
 - C. Conduction.
 - D. Convection.
 - E. Evaporation.

11. Select the recommended treatment duration for hydrocollator pack application.
 - A. 3 – 5 minutes.
 - B. 5 – 10 minutes.
 - C. 10 – 12 minutes.
 - D. 15 – 20 minutes.
 - E. 30 – 40 minutes.

12. Select a suitable condition for treating using infra-red ray therapy.
 - A. Acute ankle inflammation.
 - B. Sensory loss at lower limb.
 - C. Peripheral vascular disease.
 - D. Open wound and skin infection.
 - E. Chronic muscle spasm at shoulder.

13. Select the reason for adding mineral oil into paraffin wax therapy.
 - A. To reduce blood circulation.
 - B. To improve electrical conductivity.
 - C. To increase paraffin melting point.
 - D. To increase tissue penetration depth.
 - E. To lower the melting point for patient comfort.

14. Identify the superficial heat modality commonly used for fingers and hands.
 - A. Cryotherapy.
 - B. Ultrasound therapy.
 - C. Paraffin wax therapy.
 - D. Interferential therapy.
 - E. Shortwave diathermy.

15. Find the primary purpose of cryotherapy.
 - A. Improve digestion.
 - B. Treat acute injuries.
 - C. Promote tissue heating.
 - D. Increase muscle strength.
 - E. Enhance cardiovascular endurance.

16. Which physiological effect occurs first during cold application?
 - A. Vasodilation.
 - B. Vasoconstriction.
 - C. Increased metabolism.
 - D. Increased inflammation.
 - E. Increased nerve conduction.

17. Select information that define Lewis Hunting Reaction.
 - A. Continuous vasoconstriction.
 - B. Muscle contraction due to cold.
 - C. Tissue heating after cryotherapy.
 - D. Increased heart rate during cold exposure.
 - E. Alternating vasoconstriction and vasodilation.

18. How cold therapy decreases pain?
 - A. Increasing circulation.
 - B. Stimulating metabolism.
 - C. Increasing oxygen demand.
 - D. Producing local anaesthesia.
 - E. Enhancing muscle contraction.

19. Which of the following is a neuromuscular effect of cold therapy?
 - A. Increased metabolic rate.
 - B. Decreased pain threshold.
 - C. Increased edema formation.
 - D. Increased nerve conduction velocity.
 - E. Decreased nerve conduction velocity.

20. Identify undesirable effect that may occur after prolonged cold therapy.
- A. Bradycardia.
 - B. Hypertension.
 - C. Hyperthermia.
 - D. Increased flexibility.
 - E. Increased joint range.

II) SHORT ANSWER QUESTIONS (20 marks)

INSTRUCTION: Answer ALL questions in the answer booklet provided.

Each question carries FOUR (4) marks.

1. List **FOUR (4)** chemical mediators involved in peripheral sensitization.
2. State the primary sources of pain that may influence pain perception.
3. List **FOUR (4)** electrotherapeutic modalities.
4. State **FOUR (4)** physiological effects of cold therapy.
5. Explain **FOUR (4)** advantages of cold therapy.

SECTION B: MODIFIED ESSAY QUESTIONS (Total: 60 marks)

INSTRUCTION: This section consists of FOUR (4) questions.

Answer THREE (3) questions in the answer booklet provided.

Question 1 and Question 2 are COMPULSORY.

Question 1

- (a) Describe the procedure of sensation test for patient with right shoulder pain.
(6 marks)
- (b) Explain the appropriate modality for reducing pain and stiffness at the fingers.
(14 marks)

Question 2

- (a) Describe the mechanism of pain amplification based on the Central Biasing Theory.
(9 marks)
- (b) Explain the proper maintenance procedures for a paraffin wax bath unit.
(11 marks)

Question 3

- (a) Discuss the proper safety and maintenance procedures for an infra-red ray therapy unit. (8 marks)
- (b) Explain the procedure for applying cryocuff therapy on ankle. (12 marks)

Question 4

- (a) Discuss the mechanism of pain signal transmission from nociceptors to the brain for pain perception. (10 marks)
- (b) Explain the Lewis Hunting Reaction. (10 marks)

END OF EXAMINATION PAPER