

**BOWEN UNIVERSITY, IWO**  
**COLLEGE OF HEALTH SCIENCES**  
**BACHELOR OF PHYSIOTHERAPY PROGRAMME**  
**FIRST SEMESTER EXAMINATION – 2022/2023 SESSION**  
**COURSE CODE/TITLE: PST 415– Hydrotherapy**

**DATE: Thursday- 11<sup>th</sup> May, 2023**

**TOTAL TIME: 2 HOURS**

**GENERAL INSTRUCTION – Attempt all Questions in both Parts- I and II. Answer Section A in the Question Paper, and Section B in the answer booklet provided for both parts.**

**PART I**

**Instruction:** Answer all questions in all sections of this part.

**SECTION A**

**Instruction:** From the list of options lettered *a to d*, choose the option that best answers each question, for Questions 1 to 19. For Question 20, fill in the gap appropriately.

1. When an individual has a muscle spasm, the best hydrotherapy treatment would be (a) hot bath (b) ice cold bath (c) lukewarm whirlpool (d) room temperature
2. Which of the following foot baths will have an aromatic and stimulating effect? (a) oatmeal oink (b) peppermint oil (c) paraffin wax (d) warm soda
3. Hot hydrotherapy treatments may have which of the following effects? (a) decreases blood flow (b) decreases oedema (c) decreases muscle contraction (d) decreases heart rate
4. A bath in which the pelvis and hips are immersed with the knees higher than the pelvis is called (a) Turkish Jacuzzi (b) Crook sauna (c) Sitz bath (d) Russian whirlpool
5. Most hydrotherapy treatments transfer heat to and from the human body via (a) convection (b) conduction (c) vasoconstriction (d) vasodilatation
6. A newly licensed Bowen University graduate physiotherapist won a grant of \$100,000 from Obama foundation to set up a hydrotherapy pool. If the physiotherapist's desire is to maximise the effect of buoyancy and has to make a decision between using fresh water or sea water. Which of the following is applicable? (a) sea water is the better choice because it prevents Ebola disease (b) fresh water is the better choice because it has more buoyancy (c) sea water is preferable because it is heavier due to its salt content and has more buoyancy (d) both fresh water and sea water have the same advantages as they have equal weight and buoyancy effects
7. All the following are applicable principles of hydrotherapy except (a) water above shoulder level gives relief above 80% (b) joint pain is relieved by progressively working against turbulence using broad bats (c) strengthening of target muscles is achieved by wadding against more resistance (d) increased turbulence by fast walking creates resistance pressure for muscle strengthening
8. Which of the following is untrue regarding the physiological effect and clinical implication of hydrotherapy? (a) improves circulation by centralizing peripheral blood flow (b) facilitates

stronger contraction of the heart (c) immersion in water up to the waist can give weight relief of 50% of body weight (d) has negligible effect on the kidney

9. Which of the following produces the least change in body temperature? (a) cold bath (b) neutral bath (c) contrast bath (d) hot bath
10. Maximal oxygen uptake is higher during most forms of water exercise than during land exercise (a) true (b) false (c) depending on body mass (d) depending on anthropometric features
11. The effect of surface tension includes the following except (a) an extremity moving through the surface performs more work than when kept under water (b) an extremity moving through the surface performs less work than if kept under water (c) using equipment at the surface of water increases the resistance (d) it has therapeutic applications
12. Buoyancy typically assists in (a) treatment of oedema (b) muscle strengthening (c) improving proprioception (d) increasing water density
13. Hydrotherapy cannot manage (a) weight gain (b) stress (c) hydrophobia (d) insomnia
14. Increasing the surface area moving through water (a) creates surface tension (b) increases resistance (c) decreases resistance (d) creates viscosity
15. Fear of water cannot limit the effectiveness of any immersed activity (a) true (b) false
16. Which of the following is incorrect regarding showers? (a) all forms of showers have thermal effects (b) how hard a shower spray hits the body is a determinant of the effect (c) the effect of a shower is a function of how long the shower lasts (d) showers are streams of water directed from overhead upon one or more parts of the body
17. The following are incorrect about showers except (a) if water is at the required temperature for treatment and patient says it is abnormally cold, therapist should make it hotter than the proper temperature for the treatment (b) if a patient has diminished sensation, do not expose them to water that they need to perceive as quite cold or hot (c) hot showers cannot be given to patients whose bodies are hot (d) graduated showers use water that gradually runs from cold to hot
18. An Oxford University undergraduate reached out to you for advice on what shower would be appropriate for her. She desires to stay awake for long hours after a long day, due to her upcoming final exams. What would be the best advice? (a) cold shower, because it would cool her body and stimulate the muscles as required (b) neutral shower because it would regulate her blood pressure and calm the muscles, reduce anxiety and enhance focus as required (c) contrast shower, to improve invigoration and alertness as required (d) warm shower, for relaxation and gentle stimulation of the muscles as required
19. The effects and timing of a neutral bath are akin to those of a neutral shower (a) sometimes true (b) always true (c) never true (d) it depends on the body part targeted
20. The shower type that notably has a long pipe arm is .....

## SECTION B- MATCHING

**Instruction:** Using straight lines, match the following baths to the appropriate indications or desired effects.

- |                    |                       |
|--------------------|-----------------------|
| 1. Hot bath        | Sleep problems        |
| 2. Neutral bath    | Muscle relaxation     |
| 3. Short cold bath | Dysmenorrhoea         |
| 4. Long cold bath  | Invigoration          |
| 5. Contrast bath   | Fever                 |
| 6. Sitz bath       | Increased temperature |
| 7. Whirlpool       | Acute muscle spasm    |

## SECTION C- ESSAY

**Instruction: Attempt all questions. Write answers in the booklet provided**

1. After a stressful engagement at Bowen University Sports Festival celebration, the Executive Chairman of the occasion experienced generalized muscular pain and fatigue. You are invited to manage the client. Describe your management of the client under the following headings.
  - i. Choice of hydrotherapy treatment with a good reason
  - ii. Preparation of apparatus
  - iii. Positioning of the patient
  - iv. Preparation of the patient
  - v. Procedure of application
  - vi. Schematic diagram of the procedure
  - vii. Two home programmes within hydrotherapy for future similar cases that can be self-administered by the client with good reasons. (15 marks)
2. A runner presents to your clinic with complaint of right heel pain following intense training. Your assessment showed that client had plantar fasciitis with pain on palpation and inflammation of right heel arch, up to the tendo-Achilles. Discuss your management of the client under the following headings.
  - i. Choice of hydrotherapy treatment with a good reason
  - ii. Preparation of apparatus
  - iii. Preparation of the patient
  - iv. Procedure of application
  - v. Schematic diagram of the procedure
  - vi. One home programme (15 marks)

## PART II

**SECTION A:** Answer TRUE or FALSE for all the questions in this section.

1. Water temperature in vichy massage is around 39°C with pressure of  $8-14 \times 10^{-4} \text{ kgm}^{-2}$
2. Whirlpool therapy has been found useful in treating post-traumatic effects and improving mechanical effects for hypotonic muscles seen in polio paralysis
3. At the end of the flexible hose, there is a bar of about 1cm in diameter
4. Spa therapy is effective in the treatment of diabetic lower extremity arterial disease
5. Spa therapy is effective in the treatment of low back pain in a pregnant woman
6. Spa therapy is effective in the treatment of stress conditions in a patient with background syncope
7. After the Third World War, spa treatment became popular in the US and Europe
8. Balneotherapy is the use of thermal water for medical purposes
9. In Rome, spas were used for healing and sporting activities while in Greek, it was used for medical and recreational purposes.
10. International Spa Association defines spa as places devoted to overall well-being through a variety of professional services that encourage the renewal of mind, body and spirit
11. Types of spa includes rural and urban spa, medical spa, destination spa among others
12. One of the draw backs of hydrotherapy includes non-accessibility to water.
13. Resistance reduces the effects of gravity and decreases the amount of weight bearing on joints and muscles
14. Ai Chi uses active progressive resistance training in water to strengthen the body
15. Burdenko method challenges the centre of buoyancy in vertical positions
16. Halliwick focuses on biophysical principles of motor control in water
17. Flotation counteracts the effects of gravitational force on joints
18. Bad Ragaz ring is based on element of qigong and Tai chi chuan
19. Buoyancy is the force experienced as an upthrust which acts in the same direction to the force of gravity
20. Buoyancy creates resistance with all active movement
21. Hydrotherapy pool is a purpose built warm water pool, ideally kept at thermoneutral temperature 32.5-37.5°C designed for therapeutic use
22. Access ramp provides quick and easy access for handicapped and ambulatory swimmers
23. Ventilation means air exchange and flow
24. Hydrotherapy Pool Air handling system maintains a healthy level of humidity
25. Larger rooms air handling system are used for rooms up to 260m<sup>3</sup>
26. In smaller Rooms, air handling system unit is mounted on the wall and blows out hot air to maintain the room temperature
27. A hygrometer is an instrument that measures the specific gravity of liquids
28. A hydrometer measures specific gravity by measuring the amount of water it displaces
29. A hygrometer usually consists of a sealed hollow glass tube with a wider bottom portion a ballast and a narrow stem with graduations
30. Under water douche uses 5-6 hose spray outlet
31. Pressure in contrast douche is between  $29-58 \times 10^{-4} \text{ kgm}^{-2}$

32. The temperature for hot jet is 38-45°C and cold jet is 13-22°C
33. The hot and cold jet would be operated by the client at about 3m away from the patient
34. Contrast douche consist of applying hot and cold jets simultaneously over the body in a prescribed manner
35. Hydro-massage bath and body jet showers are examples of facilities in a modern spa
36. A good spa should have clean and aesthetic environment with a good spa team
37. Cardiac dysfunction and closed wounds are contraindications for hydrotherapy
38. Muscle stiffness and weight bearing exercises are indications for hydrotherapy
39. Viscosity provides resistance to movement when an extremity is moved
40. Hydrostatic pressure reduces effusion and assist venous return
41. The greater the depth of a patient in water, the lesser the hydrostatic pressure on the patient
42. The pool water should be monitored using a good quality pool kit twice daily
43. Water sample must be tested professionally once per month.
44. Various methods of disinfection includes chlorine, fluorine and Bromine
45. The aims in treating aquatic physiotherapy pool water are to provide safe, sparkling, disinfected and clean water
46. Bather Load indicates number of bathers
47. Emergency evacuation equipment includes telephone, rescue board, towels and scissors, rescue face mask, foil blankets
48. Aquatic therapy is carried out by an aquatic therapist
49. Immersion time for clients depends on water temperature, water and air chemistry
50. Thermo-neutral is usually window of temperature from 31.5-36.5°C.
51. Clients with acute pain, arthritic or some neurological conditions will benefit from a pool at 38°C
52. Body waxing, hydrotherapy, sauna, massage therapy are types of spa treatment
53. Destination spa is found in resorts and hotels with different facilities for relaxation and recreational purposes
54. Medical Spa focuses on medical conditions and usually provided by trained medical professional
55. Eco spa includes yoga
56. Ayurveda spa uses warm sea water for treatment
57. Vichy spray massage causes erythema and helps in breaking down of adhesions
58. Vichy spray consist of a flexible hose connected to a hot and cold pipe having a thermostatic mixing valve.
59. Cryptosporidiosis is a type of pneumonia spread through inhalation of contaminated water droplets
60. Legionnaires' disease is a type of pneumonia caused by the bacterium Legionella
61. Pseudomonas aeruginosa is a bacteria that can cause skin and ear infections and pneumonia in people with weakened immune systems
62. Cryptosporidiosis can be prevented by encouraging people to shower before entering the pool
63. Legionnaires' disease can be prevented maintaining proper water temperature and pH levels

64. Pseudomonas aeruginosa can be prevented by encouraging people to avoid swallowing the water
65. Water provides resistance that can help build strength and muscle mass
66. Water's buoyancy increases the amount of stress on your joints
67. Clients involved in work-hardening and aerobic programs will benefit from a pool at 32°C
68. A maximum relative humidity of 55% should be maintained in the pool
69. The duration of treatment should be a maximum limit of 60minutes
70. Screening should be done for presence of infectious conditions and related risk for infection such as closed wound area

**SECTION B- ESSAY: Answer all Questions in this section**

1. What is Hydrotherapy induced Skin Maceration?

Identify practical ways of eliminating it for all bathers (Therapist and Patients)

2. What is thermoneutral pool temperature?