

UNIVERSITY OF BOLTON

FACULTY OF HEALTH AND WELLBEING

FdSc DENTAL TECHNOLOGY

SEMESTER TWO EXAMINATION 2018/2019

INTRODUCTORY DENTAL BIOMATERIALS SCIENCE

MODULE NO: DNT4005

Date: Thursday 16 May 2019

Time: 2.00 pm – 3.30 pm

INSTRUCTIONS TO CANDIDATES:

There are 50 questions on this paper.

Answer ALL questions.

Each question is worth 1 mark.

Please use the answer booklet provided. Do not write your answers on the examination paper.

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

1. Which of the following is not an 'ideal' requirement of a dental biomaterial?
 - a. Dimensionally stable.
 - b. Aesthetic
 - c. Ductile
 - d. Low temperature range

2. Which metal is considered to have the highest hardness from the list below?
 - a. Pt
 - b. Cu
 - c. Au
 - d. Co

3. Which of the following alloys is most suited to the oral environment?
 - a. Stainless Steel
 - b. Cobalt Chromium
 - c. Titanium
 - d. Silver palladium

4. Which of the following would have the least impact on a dental material used in the oral cavity?
 - a. Acid
 - b. Expansion
 - c. Temperature changes
 - d. Oral fluids

5. Which of the following has the highest strength value as a biomaterial?
 - a. Lithium Disilicate
 - b. Composite
 - c. Gypsum
 - d. Zirconia Oxide

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

6. Which of the following statements relates to the term glass transition?
- A material with high translucency
 - Colour stable
 - A temperature at which a material can be moulded
 - Grain structure
7. Which of the following materials is least biocompatible?
- Lithium Disilicate
 - Poly Ethyl Ethyl Ketone
 - Nickel Chromium
 - Zirconia Oxide
8. Which statement does not relate to an acrylic denture being selected in preference to a chrome denture?
- Lower cost
 - Easier to construct
 - Quicker to make
 - Thinner in cross section
9. Which of the following is a main benefit of using CAD/CAM techniques?
- Manufacturing consistency.
 - Cheaper materials.
 - Inaccuracy in comparison to traditional techniques.
10. Which material would be chemically least affected by the oral environment?
- Poly methyl methacrylate
 - Zirconium Dioxide
 - Cobalt Chrome
 - Precious gold

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

11. When selecting a denture base alloy what in your opinion would be the most important property?
- a. Corrosion resistance
 - b. Colour
 - c. Glass transition point
 - d. Strength
12. When soldering orthodontic stainless-steel wire what should you avoid?
- a. Over heating the metal.
 - b. Close metal profiles.
 - c. Using a compatible solder.
 - d. Using flux
13. Why is molybdenum used in non-precious alloys?
- a. Bonding mechanism
 - b. Biocompatibility
 - c. Grain refiner
 - d. Corrosion resistance
14. Kaolin is used in ceramics for?
- a. Strength
 - b. The formation of a glass matrix
 - c. Its opaque properties
 - d. Elongation
15. Which of the following metal alloys does not chemically bond with ceramics?
- a. 51% Gold Alloys
 - b. Nickel chrome
 - c. Stainless steel
 - d. Cobalt chromium

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

16. Base metal alloys may contain elements that are toxic or known to cause allergic reactions in some patients, which of the following is known to cause irritation?
- Gold
 - Chromium.
 - Cobalt
 - Nickel
17. For an implant alloy what would be the least important consideration?
- Ductility
 - Strength
 - Biocompatibility
 - Cost
18. Benzoyl Peroxide is present in heat cure denture base resin as a:
- Pigment
 - Activator
 - Inhibitor
 - Initiator
19. Which type of porosity could be caused by inaccurate mixing ratios of acrylic resins during initial stages of polymerisation?
- Gaseous porosity
 - Contraction porosity
 - Granular porosity
 - Expansion porosity
20. Cobalt is used in alloys to produce high levels of strength:
- True
 - False

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

21. Stainless steel wires used in orthodontics are made from:
- 21/11 austenitic stainless steel
 - 18/8 austenitic stainless steel
 - 18/16 austenitic stainless steel
 - 19/8 austenitic stainless steel
22. Which of the following materials are least likely to be milled by CAD CAM technology?
- Composite
 - Acetal
 - Zirconium
 - Gold Alloys
23. A metallic clasp that is incorrectly placed in an undercut will eventually permanently deform because:
- The elastic limit has been exceeded
 - There is insufficient elasticity in the alloy
 - There is excessive flexibility in the alloy
 - The elastic limit has been unattained
24. Implant surfaces are designed to encourage osseointegration by:
- Encouraging bacterial colonies
 - Smooth surface topography
 - Surface treatments including acid etching, abrading and plasma
 - Cement bonding

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

25. The materials used to fabricate a milled CAD CAM implant substructure are advantageous over those materials used in the lost wax process because:
- Proper manipulation of the milling material can produce a passive fit
 - Problems of distortion encountered when using dental waxes are removed
 - Potential casting problems inherent when casting dental alloys are removed
 - All of the above
26. The following custom made device should be acid etched before leaving the dental laboratory:
- Porcelain veneers
 - Gold shell crowns
 - Full Dentures
 - Polyether Ether Ketone
27. What is the ideal surface finish for metal based restorations?
- Rubber matt finish
 - Full metal restorations cannot be highly polished
 - Highly polished
 - Air abraded.
28. The surface of an alloy used to fuse with porcelain is prepared to increase:
- Micro mechanical retention
 - Non chemical attraction between materials.
 - Sharp, angled surfaces
 - Translucency.

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

29. The two main types of soft lining material are?
- Silicone based.
 - Aluminium based.
 - Poly methyl methacrylate based.
 - Composite based.
30. Stainless steel wires when bent a number of times, break through the grain boundaries within the metal:
- True
 - False
31. As a metal cools it changes state from a liquid to a solid this is initiated by:
- Formation of stable nucleus.
 - Grains.
 - Inhibitor.
 - Metallic grains forming until the metal is at room temperature.
32. Which of the following types of gold alloy is the least brittle?
- 1
 - 2
 - 3
 - 4
33. Composite materials are most commonly cured under:
- Blue light
 - White light
 - Ultraviolet light
 - All of the above.

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

34. Why is cobalt chromium used for partial denture fabrication?
- a. Softer and more malleable than acrylic
 - b. Insulates the soft tissue
 - c. Can be cast in thin cross sections
 - d. Easily formed around teeth
35. Ductile materials are classified from an elongation percentage of more than:
- a. 2%
 - b. 3%
 - c. 5%
 - d. 7%
36. Ceramic materials have high compressive strength:
- a. True
 - b. False
37. Cold cure resins are weaker than heat cure resins by approximately:
- a. 10%
 - b. 20%
 - c. 30%
 - d. 40%
38. Platinum is used in an alloy to reduce the melting range?
- a. True
 - b. False

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

39. Galvanism occurs in the mouth when:
- Similar metals are in contact with each other
 - Patient has a dry mouth
 - Dissimilar metals are in contact in the presence of an electrolyte
 - Dissimilar metals are in contact
40. Dental alloys have melting ranges?
- True
 - False
41. Aesthetic layering ceramic materials are made up of?
- Gypsum, Kaolin and Zirconia
 - Feldspar, Quartz, Kaolin
 - Ceramic and Acrylic Resins
 - Metal Alloy, Kaolin, and Amalgam
42. Glaze is used on porcelain surfaces of crowns to:
- Close the porosity associated with dental ceramics
 - To reduce attrition of opposing dentition.
 - Reduce uptake of oral fluids.
 - All of the above
43. Surfaces of materials appear dull because:
- reflected light is directed directly back to the source
 - reflected light is directed away from the source

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

44. When the patient presents deep undercuts, clasps used for retention should ideally be constructed using:
- a. cast gold alloy
 - b. wrought wire
 - c. cobalt chromium
 - d. ceramics
45. High performance polymers PEEK and PEKK possess flexural strength properties that match natural bone properties:
- a. True
 - b. False
46. Which of the following alloys has the potential to release the most ions into the oral environment when in contact with a different metal?
- a. Cobalt Chromium
 - b. Low gold content alloys
 - c. Silver palladium alloys
 - d. High gold metal alloys
47. Which of the following materials has the least compressive strength?
- a. Acrylic Resin
 - b. Lithium Disilicate
 - c. Composite
 - d. Feldspathic Porcelain
48. Heat cure acrylics retain more residual monomer than cold cure resins?
- a. True
 - b. False

Please turn the page

Faculty of Health and Wellbeing
FdSc Dental Technology
Semester Two Examination 2018/2019
Introductory Dental Biomaterials Science
Module No. DNT4005

49. Density is an important property when centrifugal casting metals because?
- a. It makes the cast cleaner.
 - b. The investment is easier to deinvest.
 - c. Grain structure of the alloy is organised.
 - d. It makes the metal easier to cast.
50. What is the average temperature rise caused by an exothermic reaction in acrylic during the initial stages of polymerisation?
- a. 10°C
 - b. 20°C
 - c. 30°C
 - d. 40°C

END OF QUESTIONS

PAST EXAMINATION PAPER