CORRECTED

Dental Materials II; Mid-Term Examination; February 21, 2011: Version 2.2

1. Which element is added to a flux when used with chromium-containing alloys to dissolve chromium oxides?

A a. potassium fluoride b. chlorine c. potassium borate d. sodium chloride e.calcium tetraborate

2. Based on its melting temperature, a 75% gold, Type III gold alloy can be melted adequately with a:

B a. air-acetylene torch; b. air-gas torch; c. oxygen-acetylene torch; d. oxygen-gas torch; e. none of these answers

3. The fusion temperature of the solder should be at least _____ °C. below that of the parts being joined.

E a. 5-10 b. 15-25 c. 26-36 d. 37-48 e. 56-100

4. Which quality refers to the property of a solder to spread and flow well over the surfaces of the parts being joined?

D a. easy flowing b. broadly flowing c. rapid flowing d. free flowing e. easy spreading

5. The _____ temperature of an alloy determines the burnout temperature, type of investment, and type of heat source to be used during the casting process.

B a. solidus b. liquidus c. 40% of liquidus d. 80 % of solidus e. none of the above

6. Rapid removal of an elastomeric impression results in larger distortion of the impression on removal.

B a. True b. False

7. In comparison to a gold-based alloy, palladium-based alloys:

B a. have an increased tendency to tarnish; b. have increased solidus and liquidus temperature; c. can be used easily with gypsum-based investments; d. have reduced hardness; e. none of the above

8. By definition, high-noble alloys:

B a. contain a minimum of 50 wt% tin; b. must have a noble metal content of at least 60 wt%, of which at least 40 wt% is gold; c. must have a noble metal content of at least 60 wt%, of which at least 35 wt% is platinum; d. consist of 10 wt% gold, 10 wt% silver, and 80 wt% copper; e. none of the above

9. By definition, base-metal alloys contain less than ____ wt% noble metals.

C a. 10 b. 15 c. 25 d. 30 e. none of the above

10. Which of the following element(s) is/are classified as noble? Au, Pt, Pd, Iridium, Ruthenium, Rhodium, Osmium

E a. Gold, palladium, and platinum; b. Silver c. Iridium d. (a), (b), & (c) e. (a) and (c)

11. Which element(s) generally serves/serve as hardening element(s) in alloys with high gold content?

E a. Copper; b. Silver; c. Palladium; d. Platinum; e. (a), (b), (c), & (d)

12. The function of a flux is:

A a. to eliminate oxides and prevent their formation in the molten metal; b. to polish the metal surface; c. to significantly reduce the melting temperature; d. to induce the formation of an ordered solution within the metal; e. none of the above.

13. True or false: Chromium improves the melting characteristics of base-metal alloys; but does very little to improve their corrosion or resistance to tarnish.

B a. True b. false

14. True or false: Metal alloys display an exact melting point.

B a. True b. false

15. In a phase diagram of two metals in an alloy, the zone between the solidus and liquidus lines always contains:

C a. only solid metal; b. only liquid metal; c. a mixture of solid and liquid metal; d. an intermetallic compound; e. an ordered solution of the metals

16. An IDENTALLOY certificate lists the following composition for Argistar 43+, an alloy from The Argen Corporation:

A 2.0% -Gold (AU); 42.9 % Palladium (PD); 46.0% Silver (Ag); 8.0% Indium (In); 1.0% Zinc (Zn); Trace Amounts of Iridium (Ir)

This metal would be classified as: a. noble; b. high-noble; c. base; d. precious; e. none of these.

17. With respect to question 16 above; True or false: The role of zinc would be to act as an oxygen scavenger.

A a. true b. false

18. With respect to question 16 above; Trace amounts of Iridium (Ir) are added to this casting alloy for the following reason:

C a. to promote the formation of surface oxides for porcelain bonding; b. to produce a gold color to the alloy; c. to act as a grain refiner; d. to reduce the melting temperature e. none of these answers.

19. The function of borax in agar hydrocolloid is:

A a. improves the strength of the gel; b.accelerates the setting reaction; c. imparts color to the gel; d. acts as a preservative; e.improves the surface on models & dies.

20. The difference in the liquefication and gelation temperatures of agar hydrocolloid is termed:

D a. syneresis b.expansion c, imbibitions d.hysteresis e.none of the above

21. Liquefication of agar hydrocolloid is accomplished at what temperature;

B a. 45 degrees C b. 100 degrees C c. 37 degrees C d. 60 degrees C e. -10 degrees C

22. Which impression material sets by condensation of terminal mercaptan groups catalyzed by lead peroxide or a non-lead catalyst?

E a. Condensation silicone b. Addition silicone c. Polyether d. Agar hydrocolloid e. Polysulfide (Rubber base)

23. Which impression material polymerizes via a cationic, ring-opening reaction of an ethylene-imine group?

C a. Condensation silicone b. Addition silicone c.Polyether d. Agar hydrocolloid e.Polysulfide (Rubber base)

24. A platinium-containing compound serves as the catalyst for which catagory of impression materials?

B a. Condensation silicone; b. Addition silicone c. Polyether d. Agar hydrocolloid e. Polysulfide (Rubber base)

25. According to Powers, and as mentioned in the lecture material; which component contributes to the pseudoplastic rheology of polyether impression materials?

D a. silicone beads b. sodium chloride c. agar d. triglyceride network e. platinium chloride

26. The impression material which cures by condensation of terminal mercaptan groups is:

D a. Polyvinyl siloxane b. Polyether c. Agar hydrocolloid d. Polysulfide e. Condensation silicone

27. Agar hydrocolloid sets at a temperature of: 130C?

D a. 90 - 100 degrees C; b. 50 - 60 degrees C; c. 212-234 degrees C; d. 37 – 46 degrees C; e. none of these
37-45 degrees

28. A large elastic recovery value indicates:

A a. smaller distortion of the impression on removal; b. larger distortion of the impression on removal; c. greater stiffness of the impression material; d. greater flexibility of the impression material; e. faster setting of the impression material

29. Generally speaking, a low viscosity, "light-body" syringe impression material would have a higher strain-in-compression than a high-viscosity, tray impression material: True or False.

A flexibility a. true b. false low vis high strain comp hi vis low strain comp

30. Based on our discussion in class and the review session, the two most hydrophilic, highly accurate impression materials currently available are:

D a. polysulfide and condensation silicone; b. alginate and condensation silicone; c. polyvinyl silioxane (original formula) and condensation silicone; d. agar hydrocolloid and polyether ; e. hydrophilic addition silicone and polysulfide

31. True or false: In static automixing devices, the "stator" or mixing element rotates while the impression material passes through this mixing element. a. True b. false
dynamic

B

32. According to our textbook (Powers & Sakaguchi); the features which differentiate agar hydrocolloid from irreversible hydrocolloid (alginate) are:

E a. single component material; b. thermoreversible; c. improved tear strength; d. improved elastic recovery e. all of the above

33. Which category or class of chemical compounds are added to addition silicones to make them more hydrophilic?

D a. palladium salts; b. vinylpolysiloxane; c. polymethylhydrosiloxane; d. surfactants; e. polysulfide rubber

34. As we go from plaster (type II stone) to cast stone (type III stone) to die stone (type IV stone), the water to powder ratio does what?

B a. increases b. decreases c. stays the same

35. True or false: The compressive strength of a Type IV die stone is significantly higher than a type III cast stone?

A a. true b. false I, II, III, IV

36. Which of the following statements concerning gypsum-bonded investments is true?

A a. Should not be used where a constant mold temperature is > 700 °C.; b. Contains silica as a binder c. Contains only cristobalite as refractory components; d. Can be used only for a thermal expansion technique; e. Is a suitable investment for a high Palladium noble alloy.

37. Phosphate-bonded investments have high "green" strength, which means:

C a. The investment changes color to a green tint at a critical strength; b. The investment has a high strength at the precise end of working time; c. The pre-fired strength of the investment acquired by chemical reaction at room temperature; d. The strength of the investment after the wax burn-out process; e. None of the these.

38. Thermal expansion of investment materials, involving the silica polymorph refractory component, is due to the mechanism of:

B a. Displacive changes in crystal structure with bond breakage; b. Displacive changes in the crystal structure without bond breakage; c. Expansion of the calcium sulfate component; d. none of the these answers; e. a & c

39. Investments used in the thermal (thermal expansion technique) usually contain the silica refractory material _____, which has a high thermal expansion.

C a. quartz b. tridymite c. crystobalite d. calcium sulfate e. borax

40. In phosphate-bonded investments, which material reacts with phosphate ions at room temperature to cause the setting of the investment?

D a. potassium oxide b. aluminium chloride c. sodium fluoride d. magnesium oxide e. potassium citrate

41. Special liquid, which is used with Phosphate-Bonded invetments, consists of:

E a. methyl chloride b. lead acetate c.sodium fluoride d.borax e.silica sol in water

42. Special liquid, when mixed with a phosphate bonded investment (PBI) instead of just water, alters which of the following properties:

D a. increases strength; b. permits the PBI to expand hygroscopically; c. increases the setting expansion of the PBI; d. all of the above; e. none of the above.