	40					-4
De	ental Materials II	Mid-Term	Examination	Vers	ion 1.1	February 15, 2010
1.	The catalyst used in	n polyvinyl silo»	ane impression	materials is a		metal derivative.
	a) Platinum	b) Palladium	c) Zinc	d) Copper	e) Lead	
2.	The three crystalline	e silica polymo	rphs which cons	titute the refracto	ry materials i	n dental investment materials.
	a) quartz, cristoball d) lithium	ite, tridymite ; , ammonium p	b) quartz, magn hosphate, borax	esia, cristoballite	; ç⁄) calcium s	ulfate, barium glass, Bis-GMA
3.	According to the cu	rrent ADA clas	sification system	i, which criteria a	re used to cla	ssify dental casting alloys?
1	a) composition & ph	ysical propertie	es b) color c) col	or & composition	d) color & ph	ysical properties e) melting po
4.	The Au-Cu-Ag-Pd-I current ADA compo	gold alloys (co sitional classifi	ontaining approxi cation.	imately 75% gold) are classifie	d as alloys under th
1	a)high-noble	b) noble	c) type II d)	base e) typ	be l	
5.	Name the non-noble alloy. (Hint: It forms	e metal which i a solid solution	s commonly add n with palladium	led to palladium t).	o produce a	very high strength, stiff dental
	a)silver b) copper	c) platinum	d) zinc e) se	lenium		
6:	White color in a gold	d-palladium alle	oy occurs when	the concentration	of palladium	is:
	a) 1-2% b) 10% or	more c) 3% (d) 4% e) gold-p	alladium alloys a	re always yel	low.
7.	Which metallic eler structure.	nent, which wh	en present in a o	cast gold metal a	lloy, facilitate	s the refinement of the grain
•	a) indium b) stron	tium (c)) iridiur	n d) copper e)	silver		
8.	The ingredient	stre	engthens the aga	ar gel structure of	reversible hy	drocolloid impression material
1	(a) borax b) potass	um sulfate c)	potassium chlor	ride d) water	e) alkyl benz	oate
			med to into a wr		a mechanica	work the microstructure of the
9.	As a cast gold struc wrought alloy is	ture is transfor in a	ppearance.	ought structure vi		I WORK, the microstructure of tr
9.	As a cast gold struc wrought alloy is a) granular b) cell	ture is transfor in a ular (c) fibrou	ppearance.	ought structure vi random e) hoi	neycomb	i work, the microstructure of th
9. 10.	As a cast gold struc wrought alloy is a) granular b) cell The polymerization	ture is transfor in a ular () fibrou mechanism for	ppearance. Is d) highly r	ought structure vi andom e) hoi	neycomb	terized as a
9. 10.	As a cast gold struc wrought alloy is a) granular b) cell The polymerization reaction.	ture is transfor in a ular () fibrou mechanism for	ppearance. Is d) highly r polyether impre	ought structure vi andom e) hoi ession materials is	neycomb s best charac	terized as a
9.	As a cast gold struc wrought alloy is a) granular b) cell The polymerization reaction. a) condensation b)	ture is transfor in a ular () fibrou mechanism for cationic, ring-c	ppearance. Is d) highly r polyether impre	ought structure vi andom e) hoi ession materials is	neycomb s best charac n d) aldol cor	terized as a
9.	As a cast gold struc wrought alloy is a) granular b) cell The polymerization reaction. a) condensation b) The use of a silica-s	ture is transfor in a ular (c) fibrou mechanism for cationic, ring-c	ppearance. s d) highly r polyether impre ppening c) additi	ought structure vi andom e) hoi ession materials is ion polymerization osphate bonded i	neycomb s best charac n d) aldol con	terized as a
9. 10.	As a cast gold struc wrought alloy is a) granular b) cell The polymerization reaction. a) condensation b) The use of a silica-s (increases/decrease	ture is transfor in a ular c) fibrou mechanism for cationic, ring-c ol, special liqui es) expansion a	ppearance. s d) highly r polyether impre- ppening c) additi id in mixing a phrand	ought structure vi andom e) hoi ession materials is ion polymerization osphate bonded i (increase	neycomb s best charac n d) aldol con nvestment es/decreases	terized as a ndensation e) sol-gel
9. 10.	As a cast gold struc wrought alloy is a) granular b) cell The polymerization reaction. a) condensation b) The use of a silica-s (increases/decrease a) increases expansi c) increases expansi	ture is transfor in a ular c) fibrou mechanism for cationic, ring-c ol, special liqui es) expansion a on/decreases ion/increases	ppearance. s d) highly r polyether impre- pening c) additi id in mixing a ph and strength b) decreases	ought structure vi andom e) hor ession materials is ion polymerization osphate bonded i (increase reases expansion eases expansion	neycomb s best charac n d) aldol con investment es/decreases si /decreases si	terized as a ndensation e) sol-gel) strength. trength
9. 10.	As a cast gold struc wrought alloy is a) granular b) cell The polymerization reaction. a) condensation b) The use of a silica-s (increases/decrease a) increases expansi c) increases expansi c) increases expansi c) increases expansi c) increases expansi	ture is transfor in a ular c) fibrou mechanism for cationic, ring-co ol, special liqui es) expansion a on/decreases ion/increases s emoval, rapid r iate distortion)	ppearance. polyether impre- polyether impre- pening c) additi d in mixing a phand strength b) dec strength d) decre emoval of an ela of that impression	ought structure vi andom e) hoi ession materials is ion polymerization osphate bonded i (increase reases expansion eases expansion astomeric impress on?	neycomb s best charac n d) aldol cor investment es/decreases si /decreases si /decreases si	terized as a ndensation e) sol-gel) strength. trength rength nas what effect on the permar
9. 10.	As a cast gold struct wrought alloy is a) granular b) cell The polymerization reaction. a) condensation b) The use of a silica-s (increases/decrease a) increases expansi c) increases expansi c) increases expansi deformation (immed a) increases	ture is transfor in a ular c) fibrou mechanism for cationic, ring-c ol, special liqui es) expansion a on/decreases ion/increases s emoval, rapid r iate distortion)	ppearance. s d) highly r polyether impre- pening c) additi id in mixing a phand strength b) dec strength d) decre emoval of an ela of that impressiones ses c)	ought structure vi andom e) hor ession materials is ion polymerization osphate bonded i (increase reases expansion eases expansion astomeric impress on? no effect	neycomb s best charac n d) aldol cor investment es/decreases si /decreases si /decreases si	terized as a ndensation e) sol-gel) strength trength rength nas what effect on the perman
9. 10. 11. (12. 13.	As a cast gold struc wrought alloy is a) granular b) cell The polymerization reaction. a) condensation b) The use of a silica-s (increases/decrease a) increases expansi c) increases expansi c) increases expansi deformation (immed a) increases An alloy containing 7	ture is transfor in a ular c) fibrou mechanism for cationic, ring-co ol, special liqui es) expansion a on/decreases ion/increases emoval, rapid r iate distortion) b) decrea	ppearance. s d) highly r polyether impre- pening c) additi id in mixing a ph- and strength d) decreand emoval of an elar of that impression uses c) would be classif	ought structure vi random e) hor ession materials is ion polymerization osphate bonded i (increase reases expansion astomeric impress on? no effect fied (i.e., which ca	neycomb s best charac n d) aldol cor nvestment es/decreases st /decreases st sion material l	terized as a ndensation e) sol-gel) strength trength nas what effect on the perman
9. 10. 11. 12.	As a cast gold struc wrought alloy is a) granular b) cell The polymerization reaction. a) condensation b) The use of a silica-s (increases/decrease a) increases expansi c) increases expansi c) increases expansi c) increases expansi a) increases An alloy containing 7 a) base b) high not	ture is transfor in a ular c) fibrou mechanism for cationic, ring-co ol, special liqui es) expansion a on/decreases ion/increases emoval, rapid r iate distortion) b) decrea 78% palladium ole c) type III	ppearance. s d) highly r polyether impre- pening c) additi id in mixing a ph- and strength d) decre emoval of an ela of that impressiones ases c) would be classif	ought structure vi random e) hor ession materials is ion polymerization osphate bonded i (increase reases expansion astomeric impress on? no effect fied (i.e., which ca none of the answ	neycomb s best charac n d) aldol cor nvestment es/decreases st /decreases st ion material l ategory) unde	terized as a ndensation e) sol-gel) strength trength nas what effect on the perman
9. 10. 11. 12. 13.	As a cast gold struct wrought alloy is a) granular b) cell The polymerization reaction. a) condensation b) The use of a silica-s (increases/decrease a) increases expansi c) increases expansi c) increases expansi c) increases expansi c) increases expansi a) increases An alloy containing T a) base b) high noi A collection of random	ture is transfor in a ular c) fibrou mechanism for cationic, ring-co ol, special liqui es) expansion a on/decreases ion/increases emoval, rapid r iate distortion) b) decrea 78% palladium ole c) type III mly oriented cr	ppearance. s d) highly r polyether impre- pening c) additi d in mixing a ph- and strength d) decre emoval of an ela of that impressiones ses c) would be classif d) noble e) ystals in a metal	ought structure vi random e) hor ession materials is ion polymerization osphate bonded i (increase reases expansion, astomeric impress on? no effect fied (i.e., which ca none of the answ is called the met	neycomb s best charac n d) aldol con nvestment es/decreases n/increases st /decreases st ion material l ategory) unde vers listed al's _	terized as a ndensation e) sol-gel) strength. trength nas what effect on the perman

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7	Dental Materials II: Mid-Term Examination Version 1.1 February 15, 2010
	15. The metallic crystal lattice structure of gold is a structure.
	a) Face Centered Cubic (FCC) b) Body Centered Cubic (BCC) c) Hexagonal d) Rhomboid e) Cubic Zirconia
	16-If two metals react to form a new compound with a specific composition, that compound is named (most precisely) alan compound.
2	a) intermetallic b) thermoset c) ceramic polymeric e) thermoplastic
	17. The inclusion of small quantities of this element in a gold dental casting alloy or solder act as a deoxidizing agent, i.e., a scavenger of oxygen to prevent inclusion of metals oxides within the cast metal.
	a) silver b) copper c) nickel d) zinc e) platinum
	18. If solidification of metal in an investment pattern does not occur in a systematic manner, and a portion of the alloy freezes before the alloy in the casting itself, porosity can occur.
	a) suckback b) gas induced c) oxide induced d) polar flow e) none of these answers
	19. A by-product of addition silicone (polyvinylsiloxane) chemistry results in the formation of gas, which can lead to porosity in an immediately poured die stone model.
	a) helium b) carbon dioxide mydrogen d) nitrogen e) oxygen
	20. A compound based on this metallic element is added to addition silicone impression material to prevent the phenomenon described in question 19 above.
	a) indium b) copper c) zinc d) nickel e) palladium
	21. Excessive heating of solder can result, most commonly, in what artifact in the structure of the solder joint?
	(a) pitting b) narrow solder joint c) broad or large solder joint d) no effect on solder joint
×	22. The formation of a fine, more uniform grain structure in a dental alloy results in a/an in the yield and tensile strength of the alloy.
	a) decrease b) absence of change (i.e. no change) (c) increase
	23. Which impression material technique, using elastic impression materials, involves making the equivalent of a custom tray in the mouth (an intra-oral custom tray)?
	a) two step, putty-wash b) one step putty-wash b) heavy tray viscosity/lightbody syringe material d) monophase technique e) medium viscosity tray material/lightbody syringe material
	24. Which polymeric elastic impression material is inherently hydrophilic by it chemical structure, and does not require an added plasticizer?
	(a) polyether b) poly-vinyl-siloxane c) poly-sulfide d) condensation silicone e) latex-based
	25. When rapid pressure is placed on an impression syringe containing polyether, the viscosity of the material exiting the syringe tip is reduced. This rheologic phenomenon or behavior is called:
	a) pseudo-plastic b) Newtonian c) dilatent d) empirical e) neo-thermodynamic
	26. Of all the highly accurate impression materials we discussed, the only one that could be termed a truly "one- component", no mixing required material would be
	a) reversible hydrocolloid or agar b) irreversible hydrocolloid (a) polyether d) polyvinyl siloxane e) rubberbase
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Dental Materials II: Mid-Term Examination

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(27. Thermal expansion of investment materials, involving the silica polymorph refractory component, is due to the mechanism of:				
-	a) Displacive changes in crystal structure with bond breakage; b) Expansion of the calcium sulfate component; (c) Displacive changes in the crystal structure without bond breakage; d) none of the above				
	28. Which of the following choices listed below is/are classified (without exception) as noble metals?				
	a. Silver (b) Gold, palladium, iridium and platinum c. Indium d. titanium e. (a) and (d)				
	29. Which quality refers to the property of a solder to spread and flow well over the surfaces of the parts being joined?				
	a. easy-flowing b. broadly-flowing c. rapid-flowing d free-flowing e. easy-spreading				
	30. The temperature of an alloy determines the burnout temperature, type of investment, and type of heat source to be used during the casting process.				
	a. solidus (b) liquidus c. 40% of liquidus d. 80 % of solidus e. none of the above				
	31. Sulfur and sulfur-containing compounds inhibit the polymerization of which impression material?				
	a. polysulfide b. compound caddition silicone d. polyether e. agar				
1	32. Chromium predominantly contributes what property to base metal alloys?				
	a))corrosion & tarnish resistance b) increased flexibility c) reduced surface hardness d) resistance to corrosion by chlorine compounds e) lowers the alloy's melting temperature				
6	33. In addition to phosphate bonded investments, name another type (chemistry-composition) of investment material may be used routinely for higher temperature casting alloys, such as base-metal removable partial denture alloys, as well as casting of nickel-based alloys.				
	a. conventional gypsum investments b. calcium carbonate c. calcium phosphate d. clay (e) silica- or ethyl silicate-bonded investments				
	34. Which element is added to a flux when used with chromium-containing alloys to dissolve chromium oxides?				
	a.potassium fluoride b. chlorine c. potassium borate d. sodium chloride e.calcium tetraborate				
	35. The pre-fired strength of the investment acquired by chemical reaction at room temperature is called:				
	a. pickled strength b. sintered strength c. wet strength (a.) green strength e. purple strength				
36. After casting and divesting of a 4/4, full coverage gold crown, a black coating is noted on the surface of the casti which can not be removed by pickling. The most likely cause of this issue is:					
	a. suckback porosity b. surface porosity in the investment c. inadequate casting pressure				
37. Graphite from a lead pencil may be used in the soldering procedure as a:					
	a. flux b anti-flux c. solder d. wetting agent e. sprue material				
(Questions 38 through 41 continue on the next two pages (pages 4 & 5).				

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Page 4, DM II Mid-Term

Questions 38 through 41 refer to the gold-copper phase diagram below:

TEMPERATURE (°C) (Y-Axis)





38- The upper line **A** in the above binary phase diagram represents

(a.) the liquidus line

b. the solidus line

c. the intermetallic phase line

d. the micrograin alloy line

e. none of the above

39- The lower line **B** in the above binary phase diagram represents

a. the liquidus line

(b.) the solidus line

c. the intermetallic phase line

d. the micrograin alloy line

e. none of the above

40- The domain or area designated **C** represents

a. an ordered solid solution of gold and copper

(b) a random solid solution of gold and copper

c. an oriented solution of gold and copper

d. a tertiary phase distribution domain

e. an amorphous glassy phase

41- The domain or area designated **D** represents

(a.) an ordered solid solution of gold and copper b. a random solid solution of gold and copper c. an oriented solution of gold and copper

d. a tertiary phase distribution domain

e. an amorphous glassy phase

ANSWER SHEET; DENTAL MATERIALS II; MID-TERM; VERSION 1.1; FEBRUARY 15, 2010

1.	а	21.	а	41.	а
2.	а	22.	C		
3.	а	23.	а		
4.	а	24.	а		
5.	а	25.	а		
6.	b	26.	а		
7.	C	27.	C		
8.	а	28.	b		
9.	C	29.	d		
10.	b	30.	b		
11.	C	31.	С		
12.	b	32.	а		
13.	d	33.	e		
14.	а	34.	а		
15.	а	35.	d		
16.	а	36.	d		
17.	d	37.	b		
18.	а	38.	а		
19.	c	39.	b		
20.	е	40.	b		