

FD SC 4300 Prelim 3

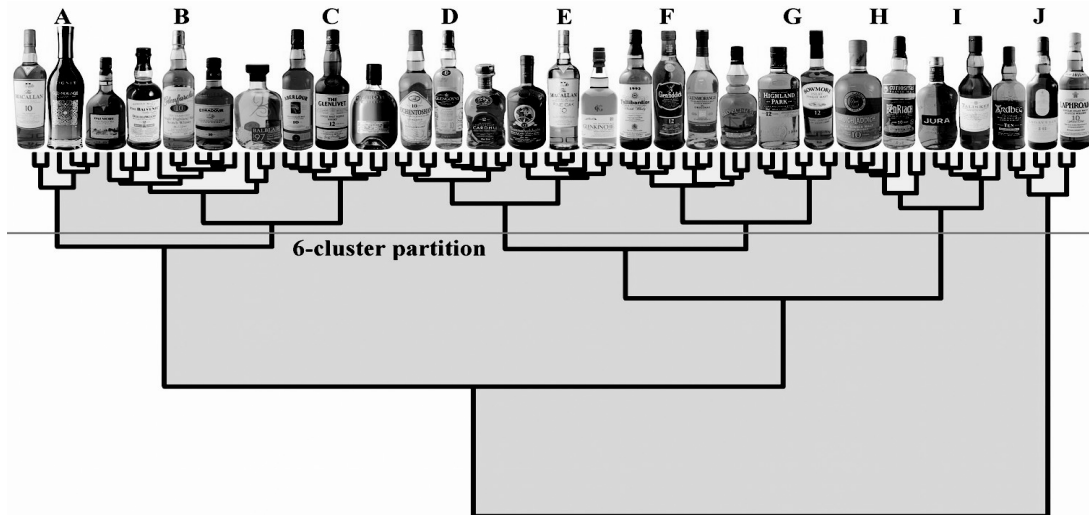
April 28, 2009

Directions: All questions will be equally weighted (2 points each)

Fill in the letter corresponding to the best answer for each question on the answer sheet provided. Please hand in only the answer sheet. You may keep the questions.

1. What is strange about the odor-active character of 2-methyl iso-borneol?
- A. It has a bell pepper aroma even more intense than IBMP.
 - B. It has two odors, active at different concentrations: “camphor” & “musty.”**
 - C. The compound does not react directly with our olfactory receptors.
 - D. Its distinct odor cannot be masked by any other odorant.

2. The image below shows a hierarchical classification of Scotch whiskies, with 10 of the whiskies labeled A-J. Of the lettered examples shown, which two whiskies are the **most** similar?



- A. I and J
 - B. C and D
 - C. B and C**
 - D. A and G
3. How many genetic variants of the human olfactory receptor are known to exist?
- A. 5
 - B. 12
 - C. 340**
 - D. 3000+

4. Humans are diploid organisms, meaning that we have two copies of each gene in the paired chromosomes of our somatic cells, including the genes that encode for our olfactory receptor proteins. Each copy of the gene is called an allele, and the two copies can either be the same (homozygous) or different (heterozygous). Every human has a nearly unique pattern of allele expression. Why is it important to account for this fact when doing psychophysical studies in olfaction?

- A. People who have heterozygous alleles cannot smell aldehydes.
- B. People with homozygous alleles will perceive every odor event as being more intense than people with heterozygous alleles.
- C. When doing sensory analysis, a different algorithm must be used for the two groups of people.
- D. **Different expression patterns mean that perception of odor-active chemicals, both in terms of qualia and intensity, will vary from person to person.**

5. What is *Brettanomyces bruxellensis*?

- A. **A wine spoilage yeast species.**
- B. A strain of *Saccharomyces cerevisiae* that enhances fruity aromas.
- C. A wine spoilage bacteria species.
- D. None of the above.

6. Which of the following is **not** one of the primary chemicals responsible for the distinct aroma of wine with “Brett” aroma?

- A. 4-ethyl phenol.
- B. 4-ethylguaiacol.
- C. **4-ethyl bruxellacol**
- D. 4-ethylcatechol

7. Which of the following was one of the theories presented (with data to back it up) to explain why some strains of *Brettanomyces* are more pleasant-smelling than others?

- A. As expected, strains that grew in French oak barrels tended to stink more than others.
- B. Some strains metabolized IBMP more effectively than others, which would increase the perception of fruitiness by decreasing bell pepper
- C. **Some strains produced higher concentrations of ethyl isobutyrate, which would increase the perception of fruitiness.**
- D. Some strains live so long in the bottle that eventually the wine stops smelling like “sweaty horse” and begins to smell very “complex”.

8. If a winemaker were trying to prevent *Brettanomyces* from significantly altering the aroma of his or her wine, which of the following is a **bad** idea?

- A. Keeping barrels, floors, and equipment clean and sterilized.
- B. Adding SO₂ immediately upon completion of malolactic fermentation.
- C. **Ensuring that the pH of the wine stays above 4.0.**
- D. Avoiding rotten or damaged fruit during grape harvest.

9. To what region of the world is *Vitis vinifera* native?
- A. Northeastern United States
 - B. Nile River Delta, Egypt
 - C. **Iraq and Turkey**
 - D. Kamchatka peninsula, Russia
10. Which of the following species of *Vitis* is especially known for its cold-hardiness, and is therefore often part of the genetic background of hybrids developed for very cold regions, including the two Minnesota wines we tasted in class?
- A. *V. vinifera*
 - B. *V. labrusca*
 - C. ***V. riparia***
 - D. *V. botrytis*
11. About how many years does it take for a wine from a new hybrid grape to reach consumers, from the time of the initial crossing to the point at which a normal consumer can actually buy and drink the wine?
- A. 4 or 5 years, depending upon the vine's vigor.
 - B. 10 years.
 - C. 15 years, 16 years if it's a Muscat varietal.
 - D. **20 years.**
12. Which of the following was **not** a trait that grape breeders in France originally sought after when developing the French-American hybrids (or "direct producers")?
- A. **The cold-hardiness of *V. vinifera*.**
 - B. The phylloxera resistance of American species.
 - C. The fungal disease resistance of American species.
 - D. The yield of *V. vinifera*.
13. Which of the following is **not** a river in Germany around which vines are grown?
- A. Mosel river
 - B. **Berlin river**
 - C. Rhine river
 - D. Nahe river
14. Germany is famous for the bends and oxbows in its rivers, which provide different exposures to the vines planted on the riverbanks. Why do the best vineyards in Germany often have steep slopes that face south?
- A. They look their most magnificent that way.
 - B. **This provides the maximum exposure to the sun, essential in a cool climate like Germany in order to achieve full ripeness.**
 - C. Steep slopes promote soil erosion, which improves wine quality.
 - D. Vines that face south are more resistant to phylloxera, which enables growers to plant the Riesling vines on their own roots.

15. What does the term “Spätlese” indicate?
- A. **How ripe the grapes were at harvest.**
 - B. The grape varietal.
 - C. The region that the wine comes from (its “appellation”).
 - D. The amount of sugar that was added to the wine via chaptalization.
16. Rieslings from cool climates are often (though not always) sold semi-dry, with a small amount of residual sugar. Outside of the fact that humans generally like sweet things, why would a winemaker do this with his cool-climate Riesling?
- A. Sugar improves the wine’s microbiological stability.
 - B. Sugar helps to balance the high tannin in cool-climate Riesling.
 - C. **Sugar helps to balance the high acid in cool-climate Riesling.**
 - D. To promote secondary fermentation in bottle, which makes the wine slightly fizzy by the time it gets to consumers, sort of like Champagne.
17. All of the following cause cloudiness in wine **except**:
- A. Tartrates.
 - B. **Methoxypyrazines.**
 - C. Proteins.
 - D. Grape solids.
18. What is one of the main differences between depth filtration and absolute filtration?
- A. Much more oxygen is introduced into a wine during depth filtration than during absolute filtration.
 - B. Depth filtration can be used as the final step in the complete sterilization of a wine, while absolute filtration cannot.
 - C. Absolute filters, such as membrane filters, are much less expensive than depth filters like DE and plate-and-frame filters.
 - D. **Depth filtration will trap most of the larger particles while still letting some through, while absolute filtration will trap all particles above a precise size.**
19. What can fining do that filtration cannot do?
- A. Clarify a wine.
 - B. Increase the wine’s microbiological stability.
 - C. Make a wine more commercially acceptable.
 - D. **Remove volatile compounds.**
20. Fining agents that are animal-derived can present problems for vegetarians and vegans. Which of the following fining agents (used at one time or another in the history of wine) is **not** animal-derived?
- A. **Bentonite.**
 - B. Albumin.
 - C. Casein.
 - D. Gelatin.

21. What is one mode of action for fining agents in wine?
- A. Positively-charged fining agents promote the flocculation of positively-charged wine colloids.
 - B. Negatively charged fining agents promote the flocculation of positively-charged wine colloids.**
 - C. Negatively charged fining agents repel the negatively-charged wine colloids, pushing them to the bottom of the tank.
 - D. Positively-charged fining agents repel the positively-charged wine colloids, pushing them to the bottom of the tank.
22. What is important to keep in mind when seeking “sustainable” solutions to problems in winemaking and viticulture?
- A. Employee health and happiness.
 - B. Keeping your business profitable.
 - C. Environmental impact of your decisions.
 - D. All of the above.**
23. If a winemaker or viticulturalist wants to make his or her operation more sustainable, what is the best first course of action?
- A. Find out what they’re doing in France, and then do exactly that.
 - B. Evaluate the problems inherent to the operation, seek to understand how they are related to one another, and then develop solutions that answer common points of conflict.**
 - C. Call the USDA and ask for their “So You Want to be Sustainable?” hand book, which provides can’t-miss sustainable solutions.
 - D. Rip out all irrigation lines: you can’t be sustainable if you irrigate.
24. How did some NY wineries survive Prohibition?
- A. They became giant underground speakeasies.
 - B. They sold wine exclusively to foreign countries.
 - C. They sold unfermented grape juice directly to consumers.**
 - D. They became distilleries.
25. Which of the following is a grape hybrid that came out of Cornell University during the years following Prohibition?
- A. Cayuga white**
 - B. Cabernet Sauvignon
 - C. Seyval blanc
 - D. White Riesling
26. Who was one of the prime movers for getting *V. vinifera* grapes involved in the NY state wine industry?
- A. Louis Pasteur
 - B. Adhemar DeChaunac
 - C. Philip Wagner

D. Dr. Konstantin Frank

27. Which of the following grape varieties is being promoted, both by Cornell and by local wineries, as the signature grape for fine wine production in the Finger Lakes?

- A. Tannat
- B. Syrah
- C. Muscat ottonel
- D. Riesling**

28. What is the primary rationale behind searing mushrooms in a hot skillet prior to braising?

- A. To “seal the juices in”; i.e., to prevent leakage of desirable flavor compounds into the pan during braising.
- B. To generate desirable aromas due to browning reactions.**
- C. To reduce the braising time needed to fully cook the mushrooms.
- D. To evaporate off undesirable, high volatility aroma compounds present on the mushroom exterior.

29. If wine is added to a preparation and simmered, what compound from the original wine do you expect to **decrease** in concentration by the largest amount?

- A. Tartaric acid, an organic acid
- B. Glucose, a sugar
- C. Methyl mercaptan, a high volatility aroma compound (“cabbage”)**
- D. Methylguaiacol, a low volatility aroma compound (“smoky”)

30. You prepare bananas with rum sauce by three different methods. Which of the following methods will result in the **least** alcohol retained (most ethanol lost)?

- A. A sugar syrup is brought to a rapid boil, the rum is added, and the pan is immediately taken off of the heat.
- B. The rum is added to a sugar-water solution, and kept at a low simmer (below 100°C) for 3 hours**
- C. The rum is added to a hot skillet and set aflame by a match (“flambé”)
- D. All of these methods will result in burning off nearly 100% of the ethanol.

31. What is likely to be the **least** appropriate way to reduce the carry-over of an astringent sensation in one’s mouth?

- A. Ingestion of a high-acid beverage, such as dry Riesling.**
- B. Ingestion of a polysaccharide solution, such as a pectin solution.
- C. Ingestion of a protein, such as steak or cheese.
- D. Ingestion of a solid polysaccharide, such as polenta.

32. Which of the following is **not** a consequence of using high adjunct in one’s beer, as opposed to all malt?

- A. Less hop aroma.**
- B. Poorer foam formation.
- C. Fewer malty flavors.
- D. A less satiating beer.

33. Which of the following beer yeast types is **incorrectly** matched with its attribute?
- A. Wheat beer yeasts: clove and spicy flavors
 - B. Lager yeasts: work better in cool fermentations
 - C. Ale yeasts: work better in warm fermentations
 - D. **Wheat beer yeasts: enhanced hop aromas**
34. Why did early brewhouses use the technique of decoction, either one or multiple times?
- A. In order to improve haze stability in the finished beer.
 - B. **In order to heat the mash, since only the brew kettle was heated.**
 - C. Decoction inhibits the growth of lactic acid bacteria, and so was used to improve microbiological stability.
 - D. In order to preserve all of the enzymes originally present in the mash.
35. Which of the following is **not** a difference between a lauter tun and a mash filter?
- A. Lauter tuns use spent grains as a filter medium; mash filters use polypropylene cloths.
 - B. Lauter tuns require more operator skill to use; mash filters require less.
 - C. Lauter tuns are large cylindrical basins; mash filters are rectangular and easier to fit into smaller spaces.
 - D. **Lauter tuns are used prior to the mashing phase; mash filters are used after the mashing phase.**
36. A key odor-active compound in Fino Sherry, Oloroso Sherry, and Tawny Port is acetaldehyde. What descriptor is generally **not** used for acetaldehyde?
- A. "Bruised apple"
 - B. "Walnut"
 - C. "Oxidized"
 - D. **"Buttered popcorn"**
37. What is **not** true about the surface yeast ("flor") during Sherry production?
- A. Flor yeast will produce acetaldehyde as a metabolic byproduct.
 - B. A benefit of the Solera system of fractional blending is to introduce fresh nutrients that sustain the flor yeast.
 - C. **The presence of flor yeast is encouraged by having an alcohol content between 18-20% by volume.**
 - D. Flor yeast will prevent ingress of dissolved oxygen into the wine.
38. What is the rationale behind adding a little bit of water or an ice cube to a distilled spirit, such as Scotch whisky or grappa?
- A. **The water dilutes the ethanol concentration, increasing the volatility of the aroma compounds in the liquid.**
 - B. Adding water prevents the spirit from giving you a hangover.
 - C. The water will help mask harsh, undesirable aromas (especially in grappa).
 - D. Water increases the viscosity of the spirit, giving it more body.

39. What is **not** a consequence of the fortification of wine with distilled spirits during Port production?

- A. The fortification will increase the microbiological stability of the sweet wine.
- B. The fortification will reduce perception of astringency, as table red wines from the region are often high in astringency.
- C. The fortification arrests the fermentation with residual sugar, which can then degrade during storage to produce desirable aromas.
- D. The fortification will decrease the pH by ~0.5 units, resulting in increased color density.**

40. What is the alleged story behind the 620 mL bottles in which *vin jaune* is sold?

- A. The region ran low on glass in the 17th century, so producers were forced to use smaller bottles: the trend stuck.
- B. The smaller bottle is necessary in order to keep the levels of sotolon in check.
- C. 620 mL represents the average volume left from 1L of original wine after 6 years of barrel aging without topping up.**
- D. The smaller bottle concentrates the alcohol; the higher alcohol content is a selling point to this day.

1. (Extra Credit) No test question is perfect.

For this question, please ask yourself a question that is something you studied for this exam, but was not asked above. Please write your question **and** answer **on the attached answer sheet**. Only complete questions and answers will receive full credit.

2. (Extra Credit) No test question is perfect.

For this question, please ask yourself a question that is something you studied for this exam, but was not asked above. Please write your question **and** answer **on the attached answer sheet**. Only complete questions and answers will receive full credit.