

FS 430 Exam 1

Directions: Please circle the ONE BEST answer for each question.

1. Until very recently the human population suffered almost daily from water borne pathogens and diseases. Wine provided one of the first processed foods free of pathogens because of what chemical constituents?

- a. Sugars.
- b. Acids.
- c. Pine pitch.
- d. Tannins.

2. Pre-Roman viticultural practices were based on the development of very large vine canopies. This resulted in the production of grape juices with very high acids and low sugars. Today you can buy very refreshing light wines that owe their taste to these ancient viticultural practices.

They are:

- a. Retsinas - Greece
- b. Champagnes - Champagne
- c. Niagara Wines- Ontario
- d. Vinho Verdes - the Duro river in Portugal

3. At the core of the Hellenic wine making technology was the amphora, a ceramic vase with a special design that aided wine fermentation and storage. What element did not contribute to it's wine making function?

- a. A narrow opening to exclude air.
- b. Glaze that stops air from passing through the ceramic.
- c. Using cork to seal the vessel
- d. A narrow bottom to collect the "lees" or sediment from the wine.

4. Mashing (during brewing) is a step in which enzymes:

- a. Make colored compounds
- b. Produce most of beer flavor
- c. Produce nutrients for yeast
- d. Are quickly inactivated

5. Yeast collected after a brewery fermentation is typically

- a. Intoxicated
- b. Reused
- c. Dead and must be discarded
- d. Barely alive

6. Barley
 - a. Can have either two or four rows of seeds around the stem
 - b. Can be grown only in temperate climates
 - c. Rarely exhibits dormancy
 - d. Grains each have an awn

7. In the process of making wine, you should not pay attention to:
 - a. The grapes
 - b. The grape juice
 - c. The wine
 - d. A strict recipe

8. After approximately how long can you consider your wine fermentation “sluggish”?
 - a. 3 days
 - b. 1 week
 - c. 3 weeks
 - d. 3 hours

9. Which is a correct order for making white wine?
 - a. Crushing, pressing, maturation, fermentation
 - b. Stemming, crushing, maceration, fermentation
 - c. Bottling, maceration, fermentation, stabilization
 - d. Stemming, crushing, bottling, pressing

10. Kilning green malt
 - a. Is carried out entirely at high temperature
 - b. Inactivates most of the enzymes present
 - c. Employs modest temperatures until moisture is low
 - d. Employs small amounts of air blown through grain

11. Which of the following is not desirable in barley germination:
 - a. Proteolytic and carbohydrate breakdown enzymes produced
 - b. Moisture content remaining approximately the same
 - c. The interior of the seed is degraded, resulting in softening
 - d. Excessive shoot and rootlet development from the seed

12. Malt color is largely due to:
- a. Sugar-amino acid reactions
 - b. Amino acid polymerization
 - c. Tannins from the malt husk
 - d. Failure to wash off dirt during steeping

13-15. Fill in the letter of the wine glass that most appropriately fits the use required when tasting a particular wine type or style. Use the image of the glasses below.



13. Merlot, a full-bodied red from California with lots of "fruit" and "butter" notes _____

14. Champagne, a phenolic, yeasty, bubbly nectar with lots of foam _____

15. Riesling, a light, fanciful white wine with great floral "bouquet" _____

16. In the 17th century wine makers in champagne produce carbonated wines (champagne) that they sold to the English at great profit. At that time it was estimated that 75% of all champagne bottles exploded before they could be consumed. By the beginning of the 19th century wine makers in champagne were able to produce carbonated wines that had consistent levels of carbonation. They could measure the sugar content in grape juice and predict the amount CO_2 that it would produce, losing only 10% of the production to overpressure. What "big idea" or scientific principal led to their art?

- a. The Uncertainty principle.
- b. The first law of thermodynamics
- c. The conservation of mass
- d. The law of multiple proportions.

17. As the technology of wine making changed over time the flavor of wine changed. Which of these flavors were not detectable in the era indicated.

- a. The floral character of white grapes in the wines of 600BC
- b. The contamination of grape juice by fungicidal sulfur in Roman wine.
- c. The taste of wood in the wine of the Renaissance
- d. A corky taste in modern wine.

18. As wine containing excess hydrogen sulfide ages, the sulfide reacts with one of the following to produce the smell of burning rubber.

- a. Glutathione
- b. Oxygen
- c. Acetaldehyde
- d. Methionine

19. What is whole-bunch pressing primarily used for in winemaking?

- a. Grape juice
- b. Young red wines
- c. Non alcoholic wines
- d. High quality sparkling wines

20. Chaptalization is the practice of:

- a. Adding sugar to increase the final alcohol content of the wine
- b. Adding sugar to increase the final sweetness of the wine
- c. Adding alcohol to increase the final alcohol content of the wine
- d. Adding acid to increase the final sweetness of the wine

21. The process of pressing the grapes to make a high quality wine:

- a. Often is longer for red grapes
- b. Often is longer for white grapes
- c. Often is shorter for green grapes
- d. Is the same for all grapes, no matter what

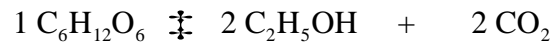
22. Why do we need yeast for the fermentation of grape juice into wine?

- a. Because yeast work 24 hours per day and don't ask for a pay raise
- b. Yeast contain all necessary enzymes for the conversion of hexoses to ethanol
- c. Because wine traditionally has been made with yeast
- d. Because yeast taste good

23. Which yeast is commonly called wine yeast?

- a. *Saccharomyces cerevisiae*
- b. *Kloeckera apiculata*
- c. *Brettanomyces bruxellensis*
- d. *Hanseniaspora vinum*

24. Give the name of the substrate and end products for the equation below:



25. The skunky flavor in beer arises due to:

- a. A photochemical reaction
- b. Hot storage of beer
- c. A malt compound
- d. Poor brewing practice

26. Hop flavor contributions to beer do not include:

- a. Bitterness due to isoalpha acids
- b. Kettle hop aroma
- c. Dry hop aroma
- d. Wet hop aroma

27. The bitterness potential and the essential oils of hops are contained in the:

- a. Leaves
- b. Lupulin glands
- c. Stems
- d. Seeds

28. During wine fermentation all the sugar can disappear while ethyl alcohol and carbon dioxide appear. The water content does not change. Further, at the beginning of the 19th century the weight of ethyl alcohol and carbon dioxide formed was discovered to be exactly equal to the amount of sugar that disappeared. Which of the following laws best expresses these observations?

- a. Conservation of Mass - Priestly, Lavoisier.
- b. Definite Composition - Proust
- c. Multiple Proportions
- d. Atomic Theory

29. Among the thousands of chemicals found in grape juice and wine a few have biological activities and some of these are present in trace levels. Among those chemicals present at less than the picogram level ($<10^{-12}$ g/L) are those that are:

- a. Intoxicating.
- b. Fattening.
- c. Tastants.
- d. Odorants.

30. You are in a restaurant (in the US) eating a salad when the waiter brings you the wine you ordered. She opens the wine and asks you to taste it. You reply "not now thank you. Please come back when the next course is served." Why did you say that? (Hint: Think of the first taste experience in the class)

- a. You wanted to establish your control of the meal.
- b. You should taste a wine with the entrée.
- c. The acid taste from the salad in your mouth will distort your assessment.
- d. Wine will ruin your enjoyment of the salad.

31. Which of the following is not generally a consideration for grape harvest criteria?

- a. The calendar
- b. pH
- c. Flavor
- d. Disease pressure

32. Which of the following wine fermentor designs and wine types match correctly?

- a. Open tank – white wine
- b. Closed tank – red wine
- c. Open tank – red wine
- d. No tank – white wine

33. Which of the following statements about juice removal during the crush are not true:

- a. Juice removal is a practice from Burgundy
- b. The removed juice can be used for pink or rosé wines
- c. The result is a wine with decreased flavor intensity, color and tannins
- d. There is an increase the ratio of skins and seeds to juice in the remaining must

34. Which of the following is a selective factor for lactic acid bacteria in wine?
- Acidic pH
 - Light
 - Grape variety
 - Water
35. Which is the predominant species of lactic acid bacteria responsible for carrying out malolactic fermentation in wines?
- Lactobacillus brevis*
 - Oenococcus oeni*
 - Escherichia coli*
 - Listeria monocytogenes*
36. Which of the following is the major benefit of malolactic fermentation?
- Improved color
 - Water reduction
 - Better aging potential
 - Deacidification
37. Eukaryotes differ from bacteria primary in which way?
- Eukaryotes have glucanases
 - Eukaryotes have circular DNA
 - Eukaryotes are able to live aerobically and anaerobically
 - Eukaryotes have a nucleus
38. Yeast have the great majority of their genes organized in which form?
- Plasmids
 - Plastids
 - Spheres
 - Chromosomes
39. Yeast participate in sexual reproduction. When they do, they have to put out a “mating call.” How can this be accomplished?
- Sex pheromones
 - Secretion of alcohol
 - Direct contact and cell-to-cell binding
 - Telephony