1. What is the main function of flour? **Structure**

2. What is gluten? **The water-insoluble proteins in wheat flour. Gliadin and glutenin hydrate when mixed with water to form gluten.**

3. What is gelatinization? **It is the swelling of starch crystals when exposed to high temperatures (140°-180°F) in the presence of water. Starch crystals absorb water during this process. Once complete, the structure is set.**

4. What classes of wheat are used for the production of bread flours?
   A. **Hard Red Winter**
   B. **Hard Red Spring**
   C. **Hard White**

5. What does wheat flour have that gives it gas retention properties? **Gluten forming proteins**

6. What does 140°F to 180°F (60° to 82°C) range represent? **The gelatinization range of wheat starch**

7. Explain what is meant by the following as applied to flour:
   A. Bleached - **Removal of color by oxidation of color pigments**
   B. Matured - **Addition of oxidants to improve gas retaining ability**
   C. Malted - **Addition of enzymes for starch conversion**
   D. Enriched - **Addition of Niacin, Thiamin, Riboflavin, Iron, and Folic Acid.**
   E. Blended - **Two or more flours combined to meet specifications**

8. How are clear flour and patent flour related? **Both flours are milled from the same wheat. Clear flour contains fine particles of bran and is darker in color. Patent flour is essentially entirely wheat endosperm. It is whiter in color.**

9. Clear flour is generally used in what type of bread products? **In products where crumb whiteness is not important. (such as rye, raisin, and multi-grain bread)**
10. What is meant by damaged and undamaged starch in bread flour? **Undamaged starch retains its crystalline structure after milling.** 5 to 8% of starch is damaged during milling, and these starches are susceptible to enzyme activity. Damaged starches also absorb more water during mixing.

11. What is meant by flour strength? **Gluten forming protein quantity and quality**

12. List as many things as possible that have an influence on dough absorption.

A. **Flour**
B. **Formulation**
C. **Product Variety**
D. **Dough system**
E. **Dough Temperature**

13. How would the type of product to be made affect dough absorption? **The higher the dough absorption the greater the pan flow. Pan flow is desired in some products, and not in others.**

14. What is the protein range usually associated with white pan bread production in the U.S.? **10.5 to 13%**.

15. What is wheat gluten or Vital wheat gluten? **The protein extract of a flour. If dried properly, It will add gas-retaining ability when used.**

16. Why would wheat gluten be used in some breads and rolls? **To add needed strength to the dough for desired product results.**

17. How much would absorption increase if 1% wheat gluten were used in a bread dough? **1.5%**

18. 1% wheat gluten will increase the protein of a flour by what percent? **0.6%**

19. When wheat gluten is added to a dough, how is the mixing and fermentation affected? **They are increased**

20. In the production of standardized white bread, the addition of non-wheat flours is limited to **3%** percent, based on flour.