Multiple Choice Questions – Lecture 3

Only one answer per question is correct!!

1. The redox state of the glass melt has important effects on:
    a. Lifetime of the furnace
    b. Energy consumption of the furnace and emissions
    c. Color of glass and heat transfer into glass melt
    d. Homogeneity of the glass products

2. What is more important for the glass quality?
    a. Average residence time of the melt in the melting tank
    b. Maximum residence time of melt in melting tank
    c. Minimum residence time of melt in melting tank
    d. Residence time of main flow path in melting tank

3. The flow patterns of the melt in a continuous container glass furnace are mainly dependent on:
    a. The viscosity of the glass at 1450 °C
    b. Density differences in the melt due to temperature differences in the furnace
    c. The liquidus temperature of the glass
    d. The viscosity of the glass at 1200 °C

4. Which refractories will undergo the highest temperatures in a regenerative glass furnace:
    a. The refractories in the crown
    b. The refractories in contact with the glass melt
    c. The refractories at the top of the regenerators
    d. The refractories at the bottom of the regenerators

5. Downstream the glass melting tank, after the throat/riser, the glass is conditioned in the working-end or refiner, before the forming process. As compared to the melt at the end of the melting-end, the temperature of the melt in the working end (just before forming) should be:
    a. Similar
    b. Increased
    c. Decreased

6. Which wavelength-range is the most relevant for the heat transfer from the flames and crown to the glass melt?
    a. In the visible light spectrum
    b. In the Infrared spectrum range
    c. In the UV spectrum range

7. A glass melt containing iron is melted in reducing conditions. The redox conditions are changed and the melt becomes more oxidized. What would you expect to occur in the melting tank (no changes in the fuel distribution and assuming no foam formation due to the redox change)
    a. The temperature at the bottom of the melting tank will increase
    b. The temperature at the bottom of the melting tank will decrease
    c. The temperature profiles will remain unchanged

8. Dust emissions of glass furnaces are mainly caused by:
    a. Fine grains in the raw materials that are carried away by the flames
    b. Dust originating from the applied fuels and present in the air
    c. Glass dust from the cullet
    d. Evaporation of glass components from the glass melt surface

9. Evaporation rates from the glass melt are mainly determined by
    a. Surface temperature melt, gas velocity above melt, furnace atmosphere and glass composition
    b. Selected raw materials in the batch
    c. The type of fuel used: fuel oil or natural gas
    d. Flow patterns of the glass melt and the fining process, removing gas bubbles from the molten glass

10. Why do glass producers try to obtain a double circulation loop of the glass melt in a glass melting tank to achieve a high glass melt quality:
    a. To improve the mixing in the melt (one strives to obtain an ideal mixer) and to increase the temperature of the bottom layer glass melt
    b. To improve the ‘melting’ of the sand grains
    c. To force all the glass melt to the area with the highest temperature and to avoid a short cut flow in the melt tank
    d. To increase the average residence time of the melt in the tank, which will improve melting and fining