**Unit 12 - Turbulent Combustion (contd.)**

**Assignment-11**

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

1) With respect to the Level Set Approach or the G-Equation method,
   - Kinematics of the flame front is described by the single flame front "particles" in G-Equation methodology.
   - G is greater than 0 on the sooty (reactant) side.
   - Total derivative of G is zero at the flame front.
   - G-Equation method is only applicable to the Thin flame regime for Premix flames.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - Total derivative of G is zero at the flame front.

2) According to the G-Equation method, choose the incorrect statement:
   - The reaction chemistry influences the G-equation through laminar flame speed $S_{L}$.
   - The strain rate influences the G-equation through laminar flame speed $S_{L}$.
   - Markstein length depends on the Lewis number, which forms a part of the G-equation.
   - The G-equation method is independent of small scale eddies affecting the premixed zone of the flame front.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - The G-equation method is independent of small scale eddies affecting the premixed zone of the flame front.

3) In G-Equation method,
   - If the flame lies in the thin reaction regime, the convective term is dominant.
   - If the flame lies in the corrugated regime, the laminar flame term is dominant.
   - Predictability density function approach also can be used to solve the premixed flame front.
   - All of the above.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - All of the above.

4) With respect to the Thickened Flame Approach used in LES,
   - applicable when actual flame front is greater than the grid size.
   - Thickened of flame front leads to an increase in the reaction rate.
   - Minor species cannot be accurately predicted using this method.
   - None of the above.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - Minor species cannot be accurately predicted using this method.

5) In case of simulation of diffusion combustion systems,
   - Mixture fraction scalar transport equation does not contain the source terms.
   - Barker-Schumann flame structure takes care of the reversible finite rate chemistry.
   - Mixture fraction variable becomes unity at the flame front.
   - Adiabatic flame temperature cannot be achieved by this methodology.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - Mixture fraction scalar transport equation does not contain the source terms.

6) For turbulent diffusion combustion system,
   - A mixture fraction variance term remains锁出 in the Monodimensional fraction conservation equation when being solved in the RANS framework.
   - The unclosed mixture fraction variance term can be closed by the gradient diffusion assumption (except in the counter-diffusion case).
   - Predictability density function can be defined as a function of mixture fraction variable.
   - All of the above.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - All of the above.

7) With reference to solving a turbulent diffusion flame using a presumed PDF approach, which of the following is incorrect
   - Flux-averaged mean mass fractions and mean temperature values can be obtained by integrating the respective equilibrium values with the PDF function.
   - Diffusion term of the Monodimensional mixture fraction acts as a production term for the mixture fraction variance.
   - Mean mixture fraction and variance equation is directly coupled with local flame structure, from where it uses the mass fraction values.
   - The parameters of a particular PDF function is tied with the details of the Mean mixture fraction and its variance.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - Mean mixture fraction and variance equation is directly coupled with local flame structure, from where it uses the mass fraction values.

8) For flamelet approach model,
   - Farrell's equations are solved for mass fraction and temperature where the source terms are absent.
   - In case of steady-flamelets, when dispersion rate achieves very high values, the equilibrium limit is achieved.
   - Extinction can be observed at very high scalar dissipation rates.
   - All of the above.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   - Extinction can be observed at very high scalar dissipation rates.