Assignment 8
The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2021-03-17, 23:59 HST.

1. Livelihood of a terrestrial animal depends primarily on __________.
   - Food temperature
   - Oxygen level
   - pH of habitat
   - All of the above
   - None of the above
   - Solution: All of the above
   - Accepted Answers: All of the above
   - 1 point

2. A shift in the peak of flame temperature and luminosity flame speed with equivalence ratio is caused by
   - variation in the heat release rate
   - ambient air flow
   - value of laminar number
   - dissociation
   - Solution: variation in the heat release rate
   - Accepted Answers: variation in the heat release rate
   - 1 point

3. Excess air flow
   - rich mixture
   - lean mixture
   - stoichiometric mixture
   - all of the above
   - Solution: all of the above
   - Accepted Answers: all of the above
   - 1 point

4. Laminar flame speed is proportional to
   - square root of reaction rate
   - reaction rate
   - square root of thermal diffusivity
   - both (a) and (b)
   - Solution: both (a) and (b)
   - Accepted Answers: both (a) and (b)
   - 1 point

5. Brightness of the flame is directly proportional to the luminosity of the flame.
   - Solution: Brightness of the flame is directly proportional to the luminosity of the flame.
   - Accepted Answers: Brightness of the flame is directly proportional to the luminosity of the flame.
   - 1 point

6. Quenching distance is proportional to flame thickness. Constant of proportionality to
   - equal to 2
   - equal to unity
   - much greater than 2
   - equal to square root of 2
   - Solution: much greater than 2
   - Accepted Answers: much greater than 2
   - 1 point

7. Laminar flame speed (cm/s) of methanol varies with equivalence ratio as per the expression \( S_f = 0.4 \sqrt{\phi} \), where \( \phi \) is the equivalence ratio.
   - Solution: Laminar flame speed (cm/s) of methanol varies with equivalence ratio as per the expression \( S_f = 0.4 \sqrt{\phi} \).
   - Accepted Answers: \( S_f = 0.4 \sqrt{\phi} \)
   - 3 points

8. Laminar flame speed (cm/s) of ethanol-methanol mixture at an equivalence ratio of 0.8 varies with the resistance temperature, \( T_r \), as \( S_f = \sqrt{0.01 \cdot T_r} \), where \( T_r \) is the resistance temperature supplied to a long burner tube of diameter 3 cm. The resistance tube is 3.0 m long. The laminar flame speed in cm/s is
   - Solution: The resistance tube is 3.0 m long. The laminar flame speed in cm/s is
   - Accepted Answers: The resistance tube is 3.0 m long. The laminar flame speed in cm/s is
   - 4 points

9. Blacksmith's marksmanship - iron is fed into a furnace burner at the rate of 316 cm/hr. The diameter of the burner is 10 mm. A conical flame is formed with a height of 3 cm. The laminar flame speed in cm/s is
   - Solution: A conical flame is formed with a height of 3 cm. The laminar flame speed in cm/s is
   - Accepted Answers: A conical flame is formed with a height of 3 cm. The laminar flame speed in cm/s is
   - 5 points

10. Consider stoichiometric hydrogen mixed with oxides, a mixture (constituted by volume) given as
    - \( [H_2] = 0.1 \) and \( [F_2] = 0.9 \)
    - \( [H_2] = 0.7 \) and \( [F_2] = 0.3 \)
    - \( [H_2] = 0.4 \) and \( [F_2] = 0.6 \)
    - \( [H_2] = 0.6 \) and \( [F_2] = 0.4 \)
    - \( [H_2] = 0.3 \) and \( [F_2] = 0.7 \)
    - Solution: \( [H_2] = 0.7 \) and \( [F_2] = 0.3 \)
    - Accepted Answers: \( [H_2] = 0.7 \) and \( [F_2] = 0.3 \)
    - 3 points

11. In problem 10, for oxidation arisen in case (a), if the laminar flame speed is 2.1 m/s, then the flame thickness in cm is
    - Solution: If the laminar flame speed is 2.1 m/s, then the flame thickness in cm is
    - Accepted Answers: If the laminar flame speed is 2.1 m/s, then the flame thickness in cm is
    - 3 points