



KERALA AGRICULTURAL UNIVERSITY

B.Tech.(Food Engg) 2016 Admission

IV Semester Final Examination-July 2018

Meen 2205

Boiler and Steam Engineering (1+1)

Marks: 50

Time:2 hours

I Fill up the blanks

(10x1=10)

- 1 The principal constituents of a fuel are -----
- 2 One kg of carbon requires ----- kg of oxygen and produces $7/3$ kg of CO.
- 3 The latent heat of steam at atmospheric pressure is ----- kJ/kg.
- 4 The mechanical draught produces ----- draught than natural draught
- 5 Water tube boilers produces steam at -----pressure than that of fire tube boiler.

State True or False

- 6 Bomb calorimeter is used for finding the lower calorific value of solid and liquid fuels
- 7 One kg of ethylene requires 2 kg of oxygen and produces $22/7$ kg of CO₂ and $9/7$ kg of H₂O.
- 8 For steam critical temperature is 374.15°C and critical pressure is 221.2 bar
- 9 The natural draught reduces the fuel consumption.
- 10 The locomotive boiler has 157 fire tubes and 24superheated tubes

II Write short notes/answers etc on ANY FIVE

(5x2=10)

- 1 Distinguish between higher and lower calorific value of a fuel
- 2 How will you convert volumetric analysis into Gravimetric analysis
- 3 Enthalpy of Evaporation
- 4 Advantages of super heated steam
- 5 Advantages of mechanical draught
- 6 Advantages of high pressure boilers
- 7 Indian boiler regulation

P.T.O

III Answer any FIVE of the following.

(5x4=20)

- 1 Various properties of liquid fuels
- 2 Discuss briefly on temperature versus total heat graph during steam formation
- 3 Determine the quantity of heat required to produce 1 kg steam at a pressure of 6 bar at a temperature of 25°C, under following conditions:
 - i. When the steam is wet having a dryness fraction 0.9
 - ii. When the steam is dry saturated; and
 - iii. When it is superheated at a constant pressure at 250°C assuming the mean specific heat of super heated steam to be 2.3 kJ/kg K.
- 4 Distinguish between forced draught and induced draught.
- 5 Construction and working of Cochran boiler with help of suitable sketch.
- 6 Distinguish between fire tube and water tube boiler.
- 7 A fuel gas has the following percentage composition by mass: CO₂ – 13.3%; CO- 0.95%; O₂ – 8.35% and N₂ – 77.4%. Convert this into volumetric analysis.

IV Write an essay on any ONE of the following

(1x10=10)

- 1 How boilers are classified and explain the construction and working of Locomotive boiler with help of suitable sketch.
- 2 Lancashire boiler with help of suitable sketch
