



Meen 2205

**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech.(Food Engg) 2017 Admission**  
**IV Semester Final Examination- June 2019**

**Boiler and Steam Engineering (1+1)**

**Marks: 50**

**Time: 2 hours**

**(10x1=10)**

**1 Fill up the blanks**

- 1 In flue gas analysis by Orsat's apparatus, carbon monoxide is absorbed by \_\_\_\_\_.
  - 2 \_\_\_\_\_ is used to measure the calorific value of solid and liquid fuel.
  - 3 \_\_\_\_\_ Constituents of coal is the most important in the production of coke.
  - 4 All the commercial liquid fuels are derived from \_\_\_\_\_.
  - 5 A boiler in India should conform to safety regulations of \_\_\_\_\_.
- State True and False**
- 6 A throttling calorimeter is also used to measure the quality of steam.
  - 7 Locomotive boiler is a water tube boiler.
  - 8 The natural draught is produced by chimney.
  - 9 The properties of water are arranged in the steam tables as functions of temperature.
  - 10 Coal gas is obtained by mixing coal and gas at ambient conditions.

**II Write short notes on ANY FIVE**

**(5x2=10)**

- 1 Difference between saturated vapour and superheated vapour.
- 2 What advantages are obtained if superheated steam is used in steam prime movers?.
- 3 Primary fuels and its importance.
- 4 A diesel power station has fuel consumption 0.2 kg per kWh. If the calorific value of the oil is 11,000 kcal per kg determine the overall efficiency of the power station.
- 5 Difference between demand factor and diversity factor.
- 6 Classification of boilers.
- 7 Boiler mountings and accessories and its list.

**III Answer any FIVE of the following.**

**(5x4=20)**

- 1 Mollier chart.
- 2 Using steam tables, determine the mean specific heat for superheated steam :  
(i) at 0.75 bar, between 100°C and 150°C ;  
(ii) at 0.5 bar, between 300°C and 400°C.
- 3 Bomb calorimeter used for the determination of heating values with neat sketch.
- 4 The maximum (peak) load on a thermal power plant of 60 mW capacity is 50 mW at an annual load factor of 50%. The loads having maximum demands of 25 mW, 20 mW, 8 mW and, 5 mW are connected to the power station. Determine: (a) Average load on power station (b) Energy generated per year (c) Demand factor (d) Diversity factor.

**P.T.O**

- 5 Requirement of good boiler.
- 6 Advantages and Limitations of Chimney / Natural Draught
- 7 A boiler is provided with chimney of 26 m height. The boiler house temperature is  $30^{\circ}\text{C}$  and temperature of flue gases leaving chimney is  $300^{\circ}\text{C}$ . If air supplied to boiler 20 kg/kg of fuel. Calculate (i) Draught in mm of water (ii) velocity of gases passing through chimney with 50% losses of draught in chimney.

**IV Answer any ONE of the following (1x10=10)**

- 1 Working of Cochran boiler with neat sketch. Also explain two advantages and two disadvantages.
- 2 Throttling Calorimeter.

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