

**MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR**  
**SEMESTER END THEORY EXAMINATION, B.Tech. Dairy Technology 2018-19**

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|------------|----------------------|---------------|-------------------------------|
| Semester   | : II (V Dean)        | Academic Year | : 2018-2019                   |
| Course No. | : DE-206             | Course Title  | : Boiler and Steam Generation |
| Credits    | : 1+1=2              | Total Marks   | : 50                          |
| Day & Date | : Friday, 21.06.2019 | Time          | : 11.00 to 13.00 Hrs.         |

- Note : 1) All questions carry equal marks.  
2) Section "A" is Compulsory.  
3) Solve **Any Three** questions from Section "B"

**SECTION - 'A'**

- Q. 1 A) Define the following. (05)
- Gross calorific value
  - Latent heat of evaporation
  - Forced Draught
  - Dryness fraction
  - Steam trap
- B) Answer in one line. (05)
- Which term is used to express the volume occupied by the unit mass of steam at certain pressure and temperature?
  - What will be the condition of steam at 12 bar pressure and 193 °C temperature?
  - State the function of Blow off cock.
  - Elaborate IBR.
  - What would be the enthalpy of 90% dry steam of 7 bar absolute pressure?
- Q. 2. A) State whether following properties are *Extrinsic* or *Intrinsic*. (05)
- Density
  - Temperature
  - Specific Entropy
  - Mass
  - Speed
- B) Choose the most appropriate answer from the options given below. (05)
- ..... is an important property of boiler fuels.
    - Flash point
    - Viscosity
    - Moisture content
    - All of these
  - The dryness fraction of supercritical fluid is .....
    - 1
    - Zero
    - Indefinite
    - Infinite
  - A boiler mounting is an ..... component of boiler.
    - Important
    - Essential
    - Additional
    - Optional

- iv) ..... is a decisive factor for selection of boiler.
- a) Type
  - b) Capacity
  - c) Cost
  - d) All of these
- v) Ratio of discharge pressure to suction pressure of a compressor is called as .....
- a) Compression ratio
  - b) Compression index
  - c) Compressor duty
  - d) Compressor index

### SECTION - 'B'

- Q. 3 A) Classify Boilers and explain any one in detail. (05)  
B) State the criteria to evaluate the performance of a Boiler. (05)
- Q. 4 A) Explain important properties of fuel for boiler. (05)  
B) Explain the factors affecting the performance of Air compressor. (05)
- Q. 5 A) Explain various types of steams in brief. (03)  
B) Discuss the process of steam formation with the help of Temp. Enthalpy diagram. (03)  
C) A fire tube boiler produces 2700 kg/h of saturated steam at 2.2 bar absolute pressure from water at 70 °C using 900 kg/h of fuel having Net calorific value of 6000 kJ/kg. Estimate 1) Equivalent evaporation, 2) thermal efficiency of the boiler. (04)
- Q. 6 A) What do you understand by the term draught? What are its different types. (03)  
B) State the importance of maintaining certain height of the boiler of the chimney. (03)  
C) A 30 m high chimney has hot gases at 320 °C and outside atmospheric temperature is 23 °C. If the furnace is supplied with 15 kg of air per kg of coal burnt calculate the draught in mm of water. (04)
- Q. 7 With neat and labeled diagram explain the construction of a 3-pass package type Boiler. Also discuss the measures to conserve energy in steam generation. (10)

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