

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)
- i) Gross calorific value
 - ii) Latent heat of evaporation
 - iii) Forced Draught
 - iv) Dryness fraction
 - v) Steam trap
- B) Answer in one line. (05)
- i) Which term is used to express the volume occupied by the unit mass of steam at certain pressure and temperature?
 - ii) What will be the condition of steam at 12 bar pressure and 193 °C temperature?
 - iii) State the function of Blow off cock.
 - iv) Elaborate IBR.
 - v) 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)
- i) Density
 - ii) Temperature
 - iii) Specific Entropy
 - iv) Mass
 - v) Speed
- B) Choose the most appropriate answer from the options given below. (05)
- i) is an important property of boiler fuels.
 - a) Flash point
 - b) Viscosity
 - c) Moisture content
 - d) All of these
 - ii) The dryness fraction of supercritical fluid is
 - a) 1
 - b) Zero
 - c) Indefinite
 - d) Infinite
 - iii) A boiler mounting is an component of boiler.
 - a) Important
 - b) Essential
 - c) Additional
 - d) 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)
