

MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR
SEMESTER END THEORY EXAMINATION, B.Tech. (D.T.) Degree Course 2016-17

Semester	: II (V Dean)	Academic Year	: 2016-2017
Course No.	: DE-206	Course Title	: Boilers and Steam Generation
Credits	: 1+1=2	Total Marks	: 50
Day & Date	: Monday, 19.06.2017	Time	: 11.00 to 13.00 Hrs.

- Note :
- 1) Section "A" is Compulsory.
 - 2) Solve **Any Three** questions from Section "B"
 - 3) The use of scientific tables, charts and calculator is allowed in case of engineering courses.

SECTION –‘A’

- Q. 1 A) Define the following. (05)
- i) Net calorific value
 - ii) Equivalent evaporation
 - iii) Induced Draught
 - iv) Renewable energy
 - v) Combustion
- B) State the function of the following in one line. (05)
- i) Blow down valve of boiler
 - ii) Expansion Joint in steam pipe
 - iii) Boiler economizer
 - iv) Compressor
 - v) Water level indicator
- Q. 2. A) State whether are following *Extrinsic* or *Intrinsic*. (05)
- i) Weight
 - ii) Calorific value
 - iii) Density
 - iv) Temperature
 - v) Specific enthalpy
- B) Choose the most appropriate answer from the options given below. (05)
- i) The net calorific value is always gross calorific value.
 - a) Equal to
 - b) Less than
 - c) More than
 - d) Twice the.
 - ii) Fire tube boilers have generally capacity than water tube boilers.
 - a) Less
 - b) Double
 - c) More
 - d) None of these
 - iii) IBR stands for
 - a) Indian Boiler Rules
 - b) International Boiler Regulations
 - c) Indian Boiler Regulations
 - d) International Boiler Rules

(P.T.O.)

- iv) Lower exhaust temperature of flue gases from boiler chimney is restricted by
- | | |
|----------------------------|-------------------------------------|
| a) Economizer | b) Dew point temperature of Sulphur |
| c) Atmospheric temperature | d) None of these |
- v) is not a renewable energy
- | | |
|-------------------|------------------|
| a) Biomass energy | b) Solar energy |
| c) Tidal energy | d) None of these |

SECTION –‘B’

- Q. 3 A) Describe the construction and working of single stage reciprocating compressor with neat and labeled diagram. (05)
B) Write short note on the generation and application of compressed air in dairy industry. (05)
- Q. 4 A) Classify Boilers and explain any one in detail. (05)
B) A boiler evaporates 3.6 kg of water per kg of coal into dry saturated steam at 10 bar from feed water at 32°C. Find equivalent evaporation. (05)
- Q. 5 A) Differentiate between natural draught and artificial draught. (03)
B) A boiler uses 18 kg air per kg of fuel. Determine the minimum height of chimney required to produce a draught of 25 mm of water. The mean temperature of chimney gases is 315 °C and that of outside air is 27 °C. (03)
C) Explain the different types of air compressors used in dairy plants. (04)
- Q. 6 A) What are different types of calorific values? Enumerate their critical differences. (03)
B) Write short note on the Indian Boiler Regulations Act. (03)
C) Calculate higher calorific value of coal having following observations on burning of 1 gm fuel in calorimeter. The 2.5 kg water filled in calorimeter experienced 2.6°C rise in temperature and water equivalent of apparatus is 390 g. If the fuel contains 65% hydrogen, also calculate its lower calorific value. (04)
- Q. 7 Enlist different renewable sources of energy and explain in detail the scope and technology of using solar energy for steam generation in context to Indian Dairy Industry. (10)
