

Menoufia University
Faculty of Engineering Shebin El-Kom
Mechanical Power Eng. Department
Post graduate Examination 2019-2020
Date of Exam : 13 /8/2020



Subject: Combustion and heat transfer in boilers & furnaces
Level: 600. Code: MPE622
Time Allowed: 3 hours
Total Marks :100 marks

Solve the Following Questions and assume any required data

Question (1)

For Boiler generated 100 t/h steam at $P= 25$ bar and $T= 400$ °C . The following data is collected during operation at maximum boiler capacity , using N.G as a fuel :

- CO_2 in flue gases 12.5%
- T_g (flue gas temperature) 225 °C
- Excess air level 25%

It is required to :

- (1) Select suitable Burners for These Conditions .
- (2) Boiler efficiency , heat balance and fuel consumption
- (3) Selection and design of draft system
- (4) How to control λ and Turn down ratio

N.B. you have to make any suitable assumptions

Question (2)

Determine the main requirements for combustion process in:

- (1) Industrial furnaces
- (2) Gas-Turbine combustor
- (3) Boiler combustion chamber

Good Luck
Prof. A.H.Elaskary