

اسئلة سابقة ..

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# لجنة الميكانيك - الإتجاه الإسلامي

Dept. of Mechanical Engineering  
Prof. Jamal Othman & Eng. M. Ellian

Energy Conversion  
1<sup>st</sup> Exam (20%) 2 Nov 2015

Name (Arabic):

Student No.

Q1. Discuss briefly? (5 points)

- a- Pour point
- b- Retorting
- c- Kerogen
- d- Availability factor
- e- Ash softening temp.

Q2. What is equivalence ratio; show how it affects combustion process? (3 points)

Q3. What are factors that should be taken into account in calculating the cost of unit electricity generated (4 points)



Q4. In Jordan Petroleum Refinery Co., a small size steam boiler is supplied with fuel gas ( $C_6H_{14}$ ) and burned with dry air. A sample of dry combustion products is collected and analysed off-line, and volumes of each component are determined to be 8.5 ml  $CO_2$ ; 3.0 ml  $O_2$ ; 5.2 ml  $CO$ ; and 83.3 ml  $N_2$ . Determine actual and theoretical A/F ratios (by wt. and mol) for the combustion process? Assuming average fuel flow rate is 0.95 kg/min, calculate exhaust flow rate and comment on how efficiency of this boiler can be improved? (8 points)





# لجنة الميكانيك - الإتجاه الإسلامي

Dept. of Mechanical Engineering  
Prof. Jamal Othman & Eng. Mutaz Ellian

Energy Conversion  
2<sup>nd</sup> Exam (20%) 7 Dec. 2015

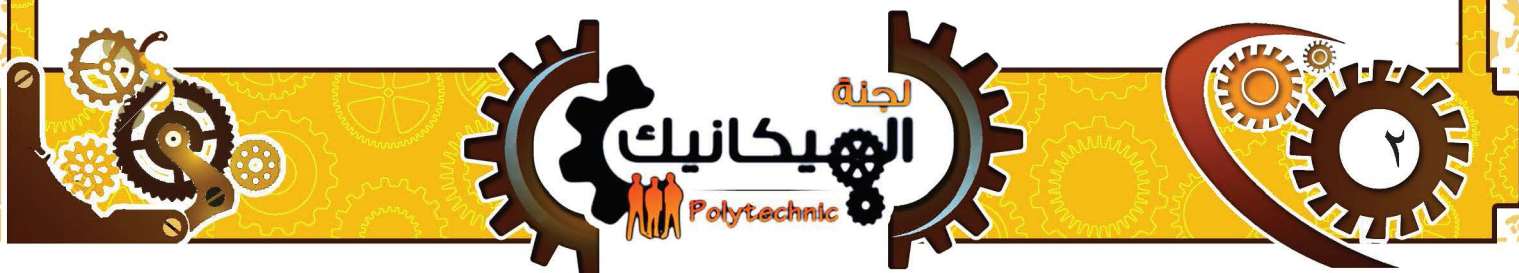
Name (Arabic):

Student No.

Q1. Discuss briefly? (7 points)

- a- Angle of declination
- b- The hour angle
- c- Total solar energy flux on a surface
- d- Aspiration
- e- Tilt angle
- f- Rotary cup
- g- Heliostats

Q2. What are types of stokers and compare between them? (4 points)



**Q3. What are pulverized burners and cyclone furnaces? (3 points)**

**Q4. PV module and Solar Water Heater installed in Zarka facing north, discuss? (4 points)**

**Q5. Discuss “burners tilted down”? (2 points)**





# لجنة الميكانيك - الإتجاه الإسلامي

Dept. of Mechanical Engineering  
Prof. Jamal Othman & Eng. Mutaz Eljlan

Energy Conversion  
Final Exam Jan 2016

Name (Arabic):

Student No.

Q1. definition (1.5 each)

- EIA:
- SCR:
- FGD:
- ESP:
- flash point:
- steam atomization:
- Net calorific value:
- solar chimney:
- thermal pollution :
- ultimate analysis:
- CSP:
- azimuth angle:



# لجنة الميكانيك - الإتجاه الإسلامي

Q2: Compare between gaseous liquid and solid fuels combustion. (5 points).

Q3: What is oil shale and can be used as source of energy.  
discuss briefly. (5 points)

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# لجنة الميكانيك - الإتجاه الإسلامي

Q4 \* Compare between : ( 6 points ).

Cyclone	Bag-house	Settling chamber
		

\* Discuss the advantages and disadvantages of FBC ( 6 point )

Q5: An industrial boiler uses solid fuel of the following composition  
( C= 89% , H<sub>2</sub> = 4% , O<sub>2</sub> = 3.8% ) If the combustion gas analyzer reads  
CO<sub>2</sub> = 10% , Calculate the percentage of excess air supplied per Kg of fuel ,  
and discuss how boiler's efficiency can be improved ? ( 10 points ).

