


Kafir El-Sheikh University		1 <sup>st</sup> <input checked="" type="checkbox"/>	<b>Semester</b>
<b>Faculty of Engineeng</b>		2 <sup>nd</sup> <input type="checkbox"/>	Academic Year
<b>Depart. : Mechanical Power Eng.</b>		<b>Exam Type</b> : Written Exam	2016 \ 2017
<b>Course Name : Combustion</b>		<b>Date of Exam</b> : 12- 1 - 2017	
<b>Course Code: : MEP 3112</b>		<b>Time Allowed</b> : 3 Hours	
<b>Level : 3</b>		<b>Maximum Degree</b> : 75 Degree	

**Answer the following questions. Assume any necessary assumptions.**

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|---|--------------------------|
|   | <b><u>Marks</u></b>      |
| <p><b>1. What is meant by:</b></p> <ul style="list-style-type: none"> <li>a- Flash Point</li> <li>c- Combustion</li> <li>e – Partially Premixed Flam</li> <li>g – Dew point</li> </ul>  | <p><b>(15 marks)</b></p> |
| <ul style="list-style-type: none"> <li>b – Ignition Temperature</li> <li>d – Diffusion Flam</li> <li>f – Adiabatic Flame Temperature</li> <li>h – Detonation</li> </ul> <p><b>2. a – Investigation the main characteristics of good fuel ?</b></p> <ul style="list-style-type: none"> <li>b – Determine combustion fuels main requirements ?</li> <li>c – Name and explain the properties of liquid fuel ?</li> </ul> | <p><b>(10 marks)</b></p> |
| <p><b>3- a) State and analysis parameters effecting combustion temperature.</b></p> <ul style="list-style-type: none"> <li>b) Discuss the flammability limits and its effect on the burning velocity</li> <li>c ) Analyze a flame structure and characteristic of each of premixed turbulent flames types .</li> </ul>  | <p><b>(10 marks)</b></p> |
| <p><b>4- The analysis of fuel consists by volume of 40% carbon monoxide (CO), 50% hydrogen, 6 % carbon dioxide (CO<sub>2</sub>), and 4 % nitrogen, (N<sub>2</sub>).the fuel is burnt in air, and the dry combustion products contained by volume, 9.2 % (CO<sub>2</sub>) and no (CO).</b></p> <p><b>- Find :- air/fuel ratio</b></p>  | <p><b>(15 marks)</b></p> |
| <p><b>5- The gravimetric analysis of the combustion products resulting from the combustion</b></p> <p><b>Compute the composition of the exhaust gases of C<sub>8</sub>H<sub>18</sub> with 10 % excess air.</b></p>  | <p><b>(10 marks)</b></p> |
| <p><b>6- Methane (CH<sub>4</sub>) is burned with stoichiometric amount of air during a combustion process Calculate</b></p> <ul style="list-style-type: none"> <li>- The air \ fuel ratio and fuel \ air ratios</li> <li>- Excess air or insufficient air factor.</li> </ul>  | <p><b>(15 marks)</b></p> |

“Good Luck”

**Examining Committee**

Assoc. Prof Essam Morsy	Dr \ Magda Kottb	Dr \ Emad Mohammed
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