


Name:			
Enrolment No:			
<b>UPES</b> <b>End Semester Examination, May 2023</b>			
<b>Course: Fuel chemistry</b> <b>Semester: IV</b> <b>Program: B.Sc. (H) Chemistry &amp; Int. B.Sc.-M.Sc Chemistry</b> <b>Course Code: CHEM 2016K</b>		<b>Time : 03 hrs.</b> <b>Max. Marks: 100</b>	
<b>Instructions:</b> Read all the below mentioned instructions carefully and follow them strictly: <ol style="list-style-type: none"> <li>1) Mention Roll No. at the top of the question paper.</li> <li>2) ATTEMPT ALL THE PARTS OF A QUESTION AT ONE PLACE ONLY.</li> </ol>			
<b>SECTION A</b> <b>(5Qx4M=20Marks)</b>			
S. No.	Question	Marks	CO
Q 1	Differentiate between renewable and non-renewable fuels. Why renewable fuels are considered better than fossil fuels?	4	CO1
Q 2	What is coal? Classify the coal on the basis of carbon content. Write the significance of proximate and ultimate analysis of coal?	4	CO1
Q 3	State the application of aromatics hydrocarbons like benzene and xylene.	4	CO3
Q 4	Explain the octane number of a fuel. Give some chemicals name used to improve octane number	4	CO3
Q 5	a. Define the pour and cloud point of a fuel. b. What is power alcohol? Discuss the advantages of power alcohol.	2+2	CO1
<b>SECTION B</b> <b>(4Qx10M= 40 Marks)</b>			
Q 6	a. What is implied by term 'Refining of Petroleum'? what are various fractions obtained by the fractional distillation of petroleum? Give one use of each. b. Explain aniline point c. Explain calorific value of a fuel	8+1+1	CO2
Q 7	a. Define lubricants. Differentiate between conducting and non-conducting lubricant oils? b. Mention the route for manufactures of isoprene petrochemicals	5+5	CO3

Q 8	0.5 g of coal sample on complete combustion was found to increase the weight of cacl <sub>2</sub> tube by 0.2 g and KOH tube by 1.2 g. calculate % C and % H in the given sample.	5+5	CO <sub>2</sub>
Q 9	What is biogas? Write the advantages and disadvantages of the biogas? Also write the difference between biogas and CNG?	5+5	CO <sub>2</sub>
<b>SECTION-C</b> <b>(2Qx20M=40 Marks)</b>			
Q 10	a. What is cracking? Classify the different cracking process. Why is cracking economically important? b. Explain the mechanism of steam by using ethane as model molecule. Or Mention the routes for the production of butadiene and propylene oxide.	10+10	CO <sub>2</sub>  CO <sub>3</sub>
Q11	Write the short notes on any four i. Water gas ii. Biofuels iii. Coal tar distillates iv. Viscosity index v. Synthetic lubricants vi. Difference between coal carbonization and gasification	20	CO <sub>2</sub>  CO <sub>3</sub>