



GIET UNIVERSITY, GUNUPUR – 765022
M. Tech. (Third Semester) Examinations, December – 2022
MPETE3013 – Theory of Combustion and Emission
(Heat Power and Thermal Engineering)

Time: 3 hrs

Maximum: 70 Marks

Answer All questions
(The figures in the right hand margin indicate marks.)

PART – A**(2 x 10 = 20 Marks)**

Q1. Answer all questions

	CO #	Blooms Level
1. Define Adiabatic Flame Temperature.	CO3	K1
2. What is multi point fuel injection?	CO3	K1
3. How does lean-burn work?	CO3	K1
4. What is ignition delay?	CO2	K2
5. Discuss briefly about fluidized beds.	CO1	K2
6. Give the three types of liquid propellants used in rocketry.	CO2	K1
7. What are circulating fluidized beds?	CO3	K2
8. Describe the common rail fuel injection system.	CO1	K1
9. What are the most common problems in common rail systems?	CO4	K2
10. State the difference between a fuel and an oxidizer.	CO4	K1

PART – B**(10 x 5 = 50 Marks)**Answer **ANY FIVE** questions

	Marks	CO #	Blooms Level
2. a. Describe the causes of nozzle wear.	5	CO1	K3
b. What are liquid propellants? Write the advantages and disadvantages of them.	5	CO1	K2
3.a. Discuss the advantages of multi point fuel injection system.	5	CO1	K1
b. Write about cyclone combustors. Describe cyclone firing.	5	CO1	K2
4. a. Discuss about the advantages and drawbacks of cryogenic fuels?	5	CO2	K2
b. How are cryogenic fuels stored and where are they used? Write the 2 types of cryogenic fuels.	5	CO2	K3
5.a. What is the difference between common rail and conventional injectors?	5	CO3	K2
b. Discuss about the multi point fuel injection system. Write the three types of MPFI systems.	5	CO3	K3
6.a. What is a solid propellant? What are the advantages and disadvantages of them.	5	CO3	K2
b. Differentiate between lean burn and rich burn engines. What is a catalytic converter? Mention the kind of metals used in a catalytic converter.	5	CO4	K1
7.a. What is flame propagation and flame speed? Write the factors affecting flame propagation.	5	CO4	K2
b. Discuss the different types of combustion equipments.	5	CO4	K1
8.a. Explain the working principle of a gas turbine engine? How does friction affect the performance of a gas turbine engine? Name some common applications of a gas turbine?	5	CO4	K3
b. What are the main components of a gas turbine engine? What do you understand by compressor efficiency? What is the purpose of a regenerator in a gas turbine setup?	5	CO4	K2

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