



GIET UNIVERSITY, GUNUPUR - 765022
M. Tech (First Semester) Examinations, January - 2024
MPETE1044 - Internal Combustion Engines
(Heat Power & Thermal Engineering)

Time: 3 Hrs

Maximum: 70 Marks

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

PART – A**(2 x 10 = 20 Marks)**

Q.1. Answer all questions

	CO#	Blooms Level
a. What are the effect of supercharging on engine performance?	CO1	K1
b. Define volumetric efficiency.	CO1	K1
c. Differentiate auto ignition and pre-ignition.	CO2	K1
d. What is fuel additivities? Give an examples	CO3	K1
e. What is Ignition Lag?	CO2	K1
f. Write the importance of Brake specific fuel consumption.	CO4	K1
g. Explain Willian's Line method.	CO2	K1
h. Compare SI and CI engine with respect to introduction of fuel and ignition.	CO1	K2
i. Explain the drawback of simple carburettor.	CO2	K1
j. Describe the mechanism of combustion of fuel spray injected in swirling air.	CO3	K1

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

	Marks	CO#	Blooms Level
2. Explain the working principle of dual fuel engine with the help of a thermodynamic cycle.	10	CO3	K1
3.a. Explain the types of supercharger with neat sketch.	5	CO1	K1
b. Explain with neat sketch of exhaust blow down loss.	5	CO1	K1
4. Calculate compression ratio of an engine with bore diameter 80 mm and stroke length 60 mm. If clearance volume is 7% of swept volume.	10	CO1	K2
5. A six cylinder 4.5 litre four stroke supercharged engine running at 4000 rpm has an overall volumetric efficiency of 150 %. The compressor has an isentropic efficiency of 90 % and a mechanical efficiency of 85% in the link with the engine. The compressed air is delivered to the engine cylinder at 57 ⁰ C and 1.8 bar pressure. The ambient conditions are 1 bar 17 ⁰ C. Determine the rate of heat rejection from the after cooler and power absorbed by the supercharger.	10	CO1	K2

6.a. Briefly explain the stage of combustion in SI engine.	7	CO2	K1
b. Explain the drawback of simple carburettor.	3	CO2	K1
7. A four stroke diesel engine working at a sea level pressure 1 bar temperature 17°C develops a brake power of 280 kW with a volumetric efficiency of 80% at sea level condition. The engine works at an air fuel ratio of 18:1 with a specific fuel consumption of 0.24 kg/kWh. The engine runs at 1800 rpm. Determine the engine capacity and bmep.	10	CO2	K3
8. Explain clearly that the factors which tend to prevent knock in SI engine. Compare the knocking phenomena in SI and CI engine	10	CO3	K1

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