Code No: I2109/R16

M. Tech. I Semester Regular/Supple Examinations, Jan/Feb-2018

ADVANCED I.C. ENGINES

Thermal Engineering (21)

Time: 3 Hours **Max. Marks: 60**

Answer any FIVE Questions
All Questions Carry Equal Marks

1.	a	Discuss the differences between the design and operating characteristics of SI and CI engines.	[6M]
	b	Explain heat transfer and engine energy balance?	[6M]
2.	a	Explain why the brake mean effective pressure of a naturally aspirated diesel engine is lower than that of a naturally aspirated spark-ignition engine.	[6M]
	b	Explain the principle of operation of a turbocharger with a neat sketch. Indicate the objectives of turbo-charging.	[6M]
3.	a	Compare the air swirl in CI engines with turbulence in SI engines.	[4M]
	b	Discuss the different types of swirl generating inlet ports with the help of neat sketches.	[8M]
4.	a	What is common rail injection system? Explain.	[6M]
	b	Explain the phenomenon of pre-ignition in SI engine. Discuss how pre-ignition leads to detonation and vice-versa.	[6M]
5.	a	What do you understand by ignition delay? Discuss the various factors that affect ignition delay.	[6M]
	b	Describe the mechanism of formation of CO and NOx emissions.	[6M]
6.	a	List down the advantages and disadvantages of using bio-diesel in IC engines.	[6M]
	b	With a simple sketch, explain the flame ionization method of measuring the unburnt hydrocarbons.	[6M]
7.		Discuss the variables that affect CI engine performance, efficiency and emissions.	[12M]
8.	a	Discuss the effect of supercharging on the following parameters: i) power output ii) mechanical efficiency iii) fuel consumption.	[6M]
	b	Explain in detail the smoke emissions in CI engines and different types of particulate traps used in filtering it.	[6M]

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