U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Mechanical Engineering **Duration: 3 hrs.**
Course Code: 20ME5DEICE **Max Marks: 100**
Course: Internal Combustion Engines **Date: 07.03.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably be assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1	a)	Discuss the effect of Fuel Air ratio on (i) Efficiency (ii) Maximum Power (iii) Maximum Temperature (iv) Maximum Pressure	**12**
	b)	The air-fuel ratio of a Diesel engine is 29:1. If the compression ratio is 16:1 and the temperature at the end of compression is 900 K, find at what cylinder volume the combustion is complete? Express this volume as a percentage of stroke. Assume that the combustion begins at the top dead centre and takes place at constant pressure. Take calorific value of the fuel as 42000 kJ/kg, R = 0.287 kJ/kg K and Cv = 0.709+0.000028 T kJ/kg K.	**08**

UNIT - II

2	a)	What is Stoichiometric air fuel ratio? Discuss the air–fuel mixture requirements for automotive engine.	**08**
	b)	Discuss the functional requirements of an injection system.	**05**
	c)	Explain the working of Electronic Control System.	**07**

UNIT - III

3	a)	Discuss the phenomenon of knocking in SI engines with neat sketches.	**10**
	b)	Explain the stages of combustion in CI engines with the help of p-θ diagram.	**10**

UNIT - IV

4	a)	Discuss vegetable oils as alternate fuel.	**10**
	b)	With a neat sketch explain the working of Alcohol surface-ignition engine.	**10**

OR

5	a)	With neat sketch, discuss the working principle of pre-combustion chamber used in CI engines.	**06**
	b)	Compare air cooling and water-cooling systems used in I.C. Engines and present your inferences.	**08**

	c)	Discuss the temperature profile across cylinder wall for water cooled and air cooled I.C. engines.	**06**

UNIT - V

6	a)	Discuss the harmful effects of gases emitted by the engine on society at large.	**06**
	b)	What are Bharath Norms and Euro norms? Discuss in detail.	**06**
	c)	Discuss the working principle of Thermal reactor package with neat sketches.	**08**

OR

7	a)	Discuss working of Centrifugal Type Supercharger with a neat sketch.	**10**
	b)	What are stratified charge engines. Discuss with an example.	**10**

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