

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2161902

Date: 01/05/2017

Subject Name: Internal Combustion Engines

Time: 10:30 AM to 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	Short Questions	14
	1 Give the function of a carburetor.	
	2 Define volumetric efficiency of an I.C. engine.	
	3 What is pre ignition in case of I.C. engine?	
	4 What is the object of supercharging?	
	5 What do you mean by a stoichiometric air-fuel ratio?	
	6 Name the term by which ignition quality of petrol is expressed.	
	7 Name the term by which ignition quality of diesel is expressed.	
	8 Give the function of flywheel in engine.	
	9 Name the different types of nozzles in fuel injector.	
	10 Define governing of I.C. engine and also name the types of the same.	
	11 Name the types of combustion chambers for S.I. engines.	
	12 What are the factors affecting the delay period?	
	13 Give the various types of lubrication and cooling system in I.C. engine.	
	14 Define 1. Mechanical efficiency and 2. Indicated mean effective pressure.	
Q.2	(a) What is I.C. Engine? Compare I.C. Engines with E.C. Engines.	03
	(b) Explain with the help of neat sketch, the working of a 2-stroke petrol engine.	04
	(c) Draw & explain valve timing diagram of 4-stroke petrol engine.	07
	OR	
	(c) Explain different losses as applied to I.C. engines.	07
Q.3	(a) Define and Explain calorific value of fuel used in I.C. engines.	03
	(b) What is scavenging? Explain uniflow scavenging.	04
	(c) What do you mean by air standard cycle and fuel air cycle? List assumptions for air standard cycle and fuel air cycle.	07
	OR	
Q.3	(a) Compare S.I. engines with C.I engines.	03
	(b) Draw and explain the working of simple carburetor.	04
	(c) Explain working and construction of bomb calorimeter.	07
Q.4	(a) Give the desirable properties of I.C. engine fuels and name different fuels available for I.C. engines.	03
	(b) Following data refers to the simple carburetor. da=0.08m, Cda=0.94, df=0.005m, Cdf=0.7. If the pressure drop amount is 0.14 bar then, Find out air-fuel ratio when (a) Nozzle lip is neglected and (b) nozzle lip is 0.5 cm. Assume density of fuel and air are 780 kg/m ³ and 1.293 kg/m ³ respectively.	04
	(c) Explain MPFI systems for S.I. engines.	07

OR

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| Q.4 | (a) Give the basic comparison between battery ignition and magneto ignition system. | 03 |
| | (b) Describe the Pintle and Pintaux nozzle with neat sketch and discuss their relative merits & demerits. | 04 |
| | (c) Explain common rail injection system used in C.I. engines. | 07 |

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| Q.5 | (a) Differentiate between supercharging and turbocharging. | 03 |
| | (b) Explain detonation or knocking in S.I. engine. | 04 |
| | (c) Explain stages of combustion in C.I. engines. | 07 |

OR

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| Q.5 | (a) | Explain briefly Emission norms (Euro and Bharat stage). | 03 |
| | (b) | Explain briefly exhaust gas recirculation system- EGR for I.C. engines. | 04 |
| | (c) | A 4-stroke 4- cylinder petrol engine develops 30 kw power at 1500 rpm. The average torque produces when each cylinder cut off is 130 Nm. The fuel used has calorific value 43.5 MJ/kg and bsfc is 0.40 kg/kwhr.
Calculate 1. Mechanical efficiency 2. Indicated thermal efficiency and 3. Brake thermal efficiency. | 07 |
