Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER • 2014

Subject Code: 161902 **Date: 28-11-2014**

Subject Name: Internal Combustion Engines

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	What do you mean by I.C. Engine? How are they classified?	**07**
	(b)	With a neat sketch explain the valve timing diagram of four stroke petrol engine. What do you mean by valve overlap?	**07**
Q.2	**(a)**	Explain the phenomenon of dissociation.	**07**
	(b)	State different methods for obtaining Friction Power and explain any one of them in details.	**07**
		OR	
	(b)	What is the function of carburetor in an SI engine? Explain the operation of simple float type carburetor with a neat sketch.	**07**
Q.3	**(a)**	Discuss in brief about the suitability of the following fuels in diesel engines. (i) Alcohols, (ii) Vegetable oils, (iii) Hydrogen.	**07**
	(b)	Draw neat and labeled diagram of multi point fuel injection system for modern automobile engines and explain its working.	**07**
		OR	
Q.3	**(a)**	Explain with suitable sketches, the following scavenging systems; (i) Uniflow scavenging, ii)Loop scavenging.	**07**
	(b)	What is Variable Compression Ratio(VCR) Engine and explain methods of obtaining VCR and performance of VCR Engine.	**07**
Q.4	**(a)**	What are the basic requirements of a good SI engine combustion chamber?	**07**
	(b)	What is ignition lag? Discuss the effect of engine variables on ignition lag in case of SI engines.	**07**
		OR	
Q.4	**(a)**	Describe with suitable sketches the combustion phenomena in diesel engine and explain the phases of combustion.	**07**
	(b)	What are the international accepted methods for measuring the NOx, CO and HC?	**07**
Q.5	**(a)**	State various methods of supercharging. Describe any two of them.	**07**
	(b)	Define the following terms : Cloud point, pour point, Cetane number and HUCR.	**07**
		OR	
Q.5	**(a)**	Write brief note on Wankle Engine.	**07**

(b) A two stroke diesel engine was motored when energy-meter reading was 1.5kW. Then the test on the engine was carried out for one hour and following observations were recorded; **07**

- Brake torque=120Nm,
- RPM=600,
- Fuel used=2.5kg,
- CV of fuel=40.3MJ/kg,
- Cooling water used=818kg,
- Rise in cooling water temperature = 10^0C,
- Cp_{water} = 4.2kJ/kg K,
- Exhaust gas temperature= 345^0C,
- Room temperature = 25^0C,
- A:F used=32:1,
- Cp_{gas} = 1.05kJ/kg K.

Draw heat balance sheet indicating units in kJ/min basis and also on percentage basis.

****