

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. **07**
 What do you mean by valve overlap?
- 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. **07**
 (i) Alcohols, (ii) Vegetable oils, (iii) Hydrogen.
 (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; **07**
 (i) Uniflow scavenging, (ii) Loop scavenging.
 (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 NO_x, CO and HC? **07**
- Q.5** (a) State various methods of supercharging. Describe any two of them. **07**
 (b) Define the following terms : **07**
 Cloud point, pour point, Cetane number and HUCR.
- 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. 07
Then the test on the engine was carried out for one hour and following observations were recorded;

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

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

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