Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2015**

**Subject code: 2140203 Date: 30/05/2015**

**Subject Name: Automobile Engines**

**Time: 10:30am-1.00pm Total Marks: 70**

**Instructions:**

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

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|---|---|---|---|
| Q.1 | (a) | Explain actual valve timing diagram for 4-stroke Gasoline engine. | 07 |
| | (b) | Explain working of 2-stroke diesel engine with neat sketch. | 07 |
| Q.2 | (a) | Enlist compensating devices. Explain any one with neat sketch. | 07 |
| | (b) | How to modify Petrol supply system into CNG supply system, explain it with diagram. | 07 |
| | | OR | |
| | (b) | Enlist Air-less injection system? Explain CRDI system with neat sketch | 07 |
| Q.3 | (a) | Explain necessity of cooling system in I.C engine? Describe working of Thermo-Syphon cooling system with neat sketch. | 07 |
| | (b) | Explain stages of combustion in S.I. engine with diagram. | 07 |
| | | OR | |
| | (a) | What is Abnormal combustion? Explain Abnormal combustion in S.I. engine. | 07 |
| | (b) | What is the function of Lubrication system? Differentiate Wet sump and Dry sump lubrication system. | 07 |
| Q.4 | (a) | What is the function of Fuel Injector? Explain working and construction of fuel injector with neat sketch. | 07 |
| | (b) | Why supercharging is more preferred in C.I. engine than S.I. engine, Discuss it. | 07 |
| | | OR | |
| | (a) | Define Scavenging. Enlist Scavenging methods and explain Loop Scavenging. | 07 |
| | (b) | Define Turbocharging. Enlist methods of Turbocharging and explain any one with neat sketch. | 07 |
| Q.5 | (a) | Explain Prony-Brake dynamometer in detail. | 07 |
| | (b) | The following data were made during the test on Diesel engine.<br>B.P. = 31.5 kW , Fuel Used = 10.5 kg/ hr, C.V. of fuel = 43000 kJ/kg<br>Jacket circulating water = 540 kg/hr, | 07 |

(P.T.O.)

Rise in Temperature of cooling water = 56°C, exhaust gas are passed through the exhaust gas calorimeter for finding the heat carry away by exhaust gas.
Water circulated through exhaust gas calorimeter = 454 kg/hr
Rise in temperature of water passing through the exhaust gas calorimeter = 36°C
Temperature of exhaust gas leaving the exhaust gas calorimeter = 82°C
A:F ratio = 19:1, Ambient temperature = 17°C,
$C_p$ of exhaust gases = 1 kJ/kg K
Draw the Heat Balance sheet on Minute and Percentage bases.

OR

(a) Describe measurement of Air consumption with neat sketch. 07

(b) Eight cylinder four stroke petrol engine having bore 10 cm and stroke 10 cm is tested when running at 5000 RPM. The load on the dynamometer is 50 kgf at a arm of 0.5 m. The engine consumed 0.45 kg of fuel per minute whose C.V. is 45000 kJ/kg. Air supplied to the engine through the carburetor is 9 kg/min at the atmospheric condition of 1 bar and 300 K 07
Find the following
(1) B.P
(2) Brake Mean Effective Pressure
(3) Brake Thermal Efficiency
(4) Air- fuel Ratio
(5) Volumetric Efficiency

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