

**B.TECH. SEM -VI MECHANICAL 2014 COURSE (CBCS) :
WINTER - 2017**

SUBJECT: INTERNAL COMBUSTION ENGINES

Day: Tuesday **Time: 10.00 AM TO 01.00 PM**
Date: 21/11/2017 **W-2017-2225** **Max. Marks: 60**

N.B:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Draw neat labeled diagrams **WHEREVER** necessary.
 - 4) Assume suitable data if necessary.
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Q.1 Give the classification of engines. **(10)**

Engine operates on ideal Otto cycle for which the following information is available. Maximum Temperature = 1277⁰C, Exhaust temperature = 447⁰C, Ambient condition = 1 bar, 37⁰C. Air consumption = 2kg/min. estimate

- i) Compression ratio
- ii) ASE, assume $C_p = 1.05 \text{ kJ/kgK}$ and $C_v = 0.718 \text{ kJ/kgK}$

OR

Explain with block diagram constructional features of IC engines. **(10)**

An engine working on Diesel cycle, the compression Ratio is 16, Cut-off takes place at 5% of the stroke the compression commences from 1 bar and 28⁰c. The air flow rate is 1 kg/min. Calculate.

- i) ASE
- ii) Indicated Power

Q.2 Explain simple carburetor with neat sketch also give the different requirements of A/F ratio in S.I. Engines. **(10)**

OR

Explain MPFI system with neat sketch. **(10)**
Discuss solid injection system in CI engines.

Q.3 Give the requirements of ignition system in case of S.I. Engines. **(10)**
Explain dry sump lubrication system with block diagram.

OR

Explain need of cooling system and discuss quality governing system with neat sketch. **(10)**

Q.4 Explain methods of supercharging. **(10)**

A four cylinder petrol engine 8 cm bore and 10 cm stroke works on 4 stroke cycle. The clearance volume per cylinder is 0.065 liters. Torque developed at 4000 rpm is 140 Nm. Fuel consumption is 14 kg/hr. Calculate.

- i) BP
- ii) BMEP
- iii) Brake thermal efficiency if CV of fuel used is 42000 kJ/kg

OR

Discuss Limitation of turbocharging. Explain Morse Test with neat sketch. **(10)**

Q.5 Explain stages of combustion in SI engines with sketch and also discuss abnormal combustion in S.I. Engines. **(10)**

OR

Explain stages of combustion in C.I. Engines. **(10)**
And also discuss ignition delay and factors influencing delay.

Q.6 Explain emissions from S.I. and C.I. Engines and their harmful effects. **(10)**
Also explain concept of Hybrid cars.

OR

Explain catalytic converter with neat sketch. **(10)**
And discuss alternative fuels for I.C. Engines.

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