

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 4094

Roll No.

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B.Tech.

(SEM VI) EVEN SEMESTER THEORY EXAMINATION,
2009-2010

I.C. ENGINES

Time : 3 Hours

Total Marks : 100

- Note :** (i) Attempt **ALL** the questions.
(ii) All questions carry **equal** marks.
(iii) If any data missing assume suitably.

1. Attempt **any two** part of the following : (2x10=20)

- (a) Define mean effective pressure.

An air standard ottocycle has a compression ratio of 8. The initial temperature and pressure are 293°K and 1 bar. The heat added during constant volume heating is 1.8MJ/kg. Find the air standard efficiency and mean effective pressure of the cycle.

- (b) Describe with neat sketch the working of four stroke petrol engine. Draw the indicator and valve timing diagram for this engine.

(c) Write notes on :

- (i) Qualities of S.I. engine fuels
- (ii) Dopes and additives.

2. Attempt **any two** parts of the following : (2x10=20)

- (a) Explain why rich mixtures are required for starting and during idling of an engine ?
A four cylinder four stroke engine running at 2000 rpm is provided with a carburettor whose venturi throat is 3 cm. Find the suction head at the throat assuming the volumetric efficiency of the engine is 0.7. Take $C_a = 1.2 \text{ kg/m}^3$ and $C_{da} = 0.8$ and atmospheric pressure is 1.013 bar. Stroke and diameter of the engine cylinder are 12 cm and 10 cm respectively.
- (b) Describe the stages of combustion in SI engine with help of a pressure crank angle diagram. Discuss the abnormal combustion and its control.
- (c) Describe the following :
 - (i) Ignition delay and effect of engine variables on ignition delay.
 - (ii) Electronic ignition

3. Attempt **any four** parts of the following : (4x5=20)

- (a) What are the different types of injection system ? Describe a common Rail system.
- (b) Make a neat sketch of fuel injector and explain its working.
- (c) What are the causes of knock in C.I engine ? How it is controlled ?

- (i) Work required to compress and deliver 1 kg of air
 - (ii) Actual power required to run the compressor if mechanical efficiency is 80%.
 - (iii) Heat lost through the cylinder walls per minute.
 - (iv) Isothermal efficiency.
- (b) Describe the function of impeller and diffuser in a centrifugal compressor. Draw the velocity diagrams for the inlet and outlet of the impeller.
- (c) Describe a axial flow compressor. Discuss the merits and demerits of Centrifugal Compressor over axial flow Compressor.

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