



## V SEMESTER B.TECH (MECHANICAL ENGINEERING) **END SEMESTER EXAMINATIONS, NOV/DEC 2015**



SUBJECT: INTERNAL COMBUSTION ENGINES THEORY AND AIR

## POLLUTION [MME 341]

## **REVISED CREDIT SYSTEM**

Time: 3 Hours

MAX, MARKS: 50

## Instructions to Candidates:

- ✤ Answer ANY FIVE FULL the questions.
- ✤ Missing data may be suitable assumed.
- 1A. (05) With a neat sketch explain the basic components of an Internal Combustion engine. (05)
- 1B. Define :
  - i) Scavenging
- ii) Piston blow- down
- iv) Time loss factor iii) Dissociation
- Diesel knock V)
- 2A. Mention the factors taken into account for fuel air cycle when compared to air (04) standard cycle
- 2B. Give reasons why in premixed and in diffusion combustion processes, (03) absorption of heat by the products of combustion is not preferred. What are its effects?
- 2C. Abnormal pressure rise caused in SI engines is different than that in CI (03) engines. Give three comparisons between the two.
- 3A. A certain type of nozzle used in pre- combustion chamber has a fine spray (04) hole leading from below the valve seat at an angle to the nozzle axis. With a neat sketch explain its working.
- 3B. What are the methods of generating air swirl in CI engines (02)
- 3C. With a neat sketch explain the working of an apparatus used to record fuel (04) volatility according to ASTM standards.
- 4A. (02) Define Cetane no. and sensitivity of fuel. 4B. (04) Explain the functioning of dual fuel operation of petrol and LPG 4C. (04)
- A charging mechanism requires time to boost the inlet air pressure to an IC engine. With a neat sketch explain its working.

- 5A. Give reasons:

  (i) An IC engine consumes more quantity of alcohol compared to gasoline for the same power output
  (ii) Degree of turbo charging and super charging is proportional to fuel (02) consumption.

  5B. With a neat sketch explain positive crankcase ventilation system. (05)
  5C. Briefly explain the methods to control smoke. (03)
- **6A.** With required sketches explain methods to reduce  $NO_X$  emissions. (05)
- 6B. An unknown hydrocarbon fuel is burned with atmospheric air and by means of Orsat apparatus the following percentage composition of products of combustion were recorded: CO<sub>2</sub>- 10.1%, N<sub>2</sub>- 87%, O<sub>2</sub>- 1.9%, CO- 1%

Calculate the actual A/F ratio and percentage of deficit or excess air (05) supplied.