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PRESIDENCY UNIVERSITY BENGALURU

**SET-B**

SCHOOL OF ENGINEERING

**MAKE-UP EXAMINATION –JULY 2024**

**Semester :** Semester VI

**Course Code :** MEC4009

**Course Name :** I. C. Engine and Fuels

**Program :** B. Tech. Mechanical Engineering

**Date :** 10 JULY 2024

**Time :** 9:30 AM - 12:30 PM

**Max Marks :** 100

**Weightage :** 50%

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

**PART A**

**ANSWER ANY FIVE QUESTIONS 5QX2M=10**

* 1. What is piston speed? Explain.
  2. What are piston rings? Explain.
  3. What is solid injection system?
  4. Is combustion a chemical reaction? Explain
  5. What is the function of Crank mechanism in IC Engines?
  6. Give a note on main pollutants from engines.
  7. What are the two ways in which UBHC comes out of vehicles?

(CO1) [Knowledge] (CO1) [Knowledge] (CO2) [Knowledge] (CO3) [Knowledge] (CO3) [Knowledge] (CO4) [Knowledge] (CO4) [Knowledge]

**PART B**

**ANSWER ANY SIX QUESTIONS 6QX10M=60**

* 1. A single cylinder 4-stroke engine runs at 1000 rpm and has a bore of 115mm and a stroke of 140mm. The brake load is 60N at 600 mm radius and 𝛈m=0.𝟖%. Calculate brake power, Indicated Power and mean effective pressure.

(CO1) [Comprehension]

* 1. List the advantages and disadvantages of Hydrogen as a fuel

(CO2) [Comprehension]

* 1. With proper sketches compare the knocking in SI and CI engines and explain them.

(CO3) [Comprehension]

* 1. List and discuss the factors affecting detonation in CI engines
  2. Explain the different factors that affect flame propogation
  3. List and explain the causes of pollution and their effects.

(CO3) [Comprehension] (CO3) [Comprehension] (CO4) [Comprehension]

* 1. Give a note on Indian Emission standards with year of introduction, area of coverage and acceptable values of pollution levels.
  2. Give a note on the formation of CO and Particulate Matter

(CO4) [Comprehension] (CO4) [Comprehension]

**PART C**

**ANSWER ANY TWO QUESTIONS 2QX15M=30**

* 1. Diesel is an oil like fuel and has specific characteristics. With proper pressure - crank angle diagram explain how its combustion takes place in CI engines.

(CO3) [Application]

* 1. Though it is always desired to have proper combustion in engines, many times it takes different route. Explain the different types of abnormal combustion in SI engines. Explain in detail with diagrams about knocking, its characteristics and effects.

(CO3) [Application]

* 1. One of the important methods to arrest pollution is the adoption of EGR. Provide complete information on the process with the help of sketches.

(CO4) [Application]