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PRESIDENCY UNIVERSITY BENGALURU

 **SET-A**

SCHOOL OF ENGINEERING

**END TERM EXAMINATION – MAY/JUNE 2024**

**Semester :** Semester VI - 2021

**Course Code :** MEC4009

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

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

**Date :** June 18, 2024

**Time :** 1:00 PM - 4:00 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. Define combustion and mention its types.
2. Provide four differences between petrol and diesel engines.
3. Define alternate fuels with examples.
4. What is abnormal combustion? Explain
5. What are petroleum products? How are they formed?
6. What are the effects of pollution on environment
7. Why was Bharath stage 5 skipped? Explain.

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

**PART B**

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

1. A 4-stroke engine has a piston diameter 250mm and stroke 400mm. The mean effective pressure is 4 bar and speed is 500 rpm. The diameter of the brake drum is 1000 mm and the effective brake load is 1000N. Find the indicated power, brake power and friction power**.**

(CO1) [Comprehension]

1. List different biodiesels and explain the process of converting a vegetable oil into a biodiesel

(CO2) [Comprehension]

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

(CO3) [Comprehension]

1. Clearly discuss the effects of knocking or detonation
2. Properly explain the different factors that affect SI knocking

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

1. Clearly explain how these pollutants are formed in IC engines. (i) UBHC and (ii) NOx

(CO4) [Comprehension]

1. What are the international pollution standards available? Provide proper comparison between Euro and Bharath stages of pollution control.

(CO4) [Comprehension]

1. Explain how a thermal rector package helps in reducing pollution from vehicles

(CO4) [Comprehension]

**PART C**

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

1. Explain the different SI combustion chamber designs with relevant sketches.

(CO3) [Application]

1. Petrol is a volatile fuel and has specific characteristics. With proper pressure - crank angle diagram explain how its combustion takes place in SI engines.

(CO3) [Application]

1. Catelytic converters are one of the important component to reduce emission hazards. Explain its parts and functioning with a neat sketch.

(CO4) [Application]