Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_

**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14ME2053** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ALTERNATIVE FUELS FOR I.C ENGINES** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain the refining process of petroleum with neat line diagram and list down its products. | CO1 | 15 |
| b. | Define Cloud point and Flash point. | CO1 | 05 |
| **(OR)** | | | | |
| 2. | a. | Write a short note on Knock rating of S.I engine fuels. | CO1 | 06 |
| b. | Explain the following terms:  i) API gravity and specific gravity ii) Diesel Index  iii) Aniline point iv) Sensitivity  v) Cetane number vi) Effect of knocking | CO1 | 14 |
|  |  |  |  |  |
| 3. | a. | Discuss the performance and emission characteristics of CNG in SI engine. | CO2 | 16 |
| b. | Mention the modifications required if the CNG is used in S.I. engine as a substitute of fuel. | CO2 | 04 |
| **(OR)** | | | | |
| 4. | a. | Mention the advantage and disadvantage of methanol as a fuel. | CO2 | 05 |
| b. | With the help of graphs, discuss the effects of percentage of methanol blends (DM15 and DM20) used with diesel on brake thermal efficiency, brake specific fuel consumption and exhaust emission as NOX, CO2 and Smoke taking in x-direction brake power as a parameter. | CO2 | 15 |
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| 5. | a. | Discuss the factors affecting combustion in a dual - fuel engine. | CO1 | 15 |
| b. | Differentiate between CNG & LPG with respect to their properties. | CO1 | 05 |
| **(OR)** | | | | |
| 6. | a. | Discuss the performance and emissions of LPG as a fuel in Diesel Engine in dual fuel mode and state its advantages. | CO1 | 13 |
| b. | Describe the working of dual-fuel engine with neat sketch. | CO1 | 07 |
|  |  |  |  |  |
| 7. |  | Describe the exhaust gas recirculation device for the control of oxides of nitrogen emission from SI engine. | CO2 | 20 |
| **(OR)** | | | | |
| 8. | a. | List out methods of controlling pollution. | CO2 | 06 |
| b. | Discuss the environmental effect of different pollutants emitted from IC engine on human and plant life. | CO2 | 14 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Discuss the performance and emission characteristics of Pongamia Bio-Diesel and their blends Operated on CI Engine. | CO2 | 15 |
| b. | Write a short note on Esterification process. | CO2 | 05 |