MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

V SEMESTER B. TECH (MECHANICAL/IP ENGG.) END SEMESTER MAKE UP EXAMINATIONS, DECEMBER 2018

SUBJECT: THEORY OF INTERNAL COMBUSTION ENGINES AND

EMISSIONS [MME 4036]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitably assumed.
- 1A. How Fuel-air cycles differ from air-standard cycles? Explain with suitable (3) reasons.
- 1B. The efficiency of actual cycle is much lower than the efficiency of air standard (4) cycle. Discuss with suitable reasons.
- 1C. Describe the following: (i) heat of formation, (ii) chemical equilibrium, (iii) (3) ignition limits
- 2A. Discuss the merits of non-conventional fuels. (3)
- 2B. What is the significance of ASTM distillation curve? (3)
- 2C. Explain with a neat sketch the "Reid Vapour Pressure Test" and discuss its (4) significance.
- 3A. Discuss the three basic requirements of a good SI engine combustion (3) chamber.
- 3B. The requirement of air motion and swirl in a CI engine combustion chamber is (4) much more stringent than in an SI engine. Justify this statement.
- 3C. In agriculture field, it is better to use CI engine than SI engine. Justify this (3) statement.
- 4A. Explain with a neat diagram the working of a MPFI engine. (3)
- 4B. Explain with a neat diagram the working of a stratified charge engine. (4)
- 4C. TBI system could not become successful, why? (3)
- 5A. What is the mechanism of smoke formation? (2)
- 5B. What are the sources of evaporative emission in petrol engines? (2)

- 5C. Explain briefly the exhaust gas recirculation (EGR) device for the control of (3) NOx.
- 5D Discuss the effects of emissions on human health. (3)