Reg. No. | | | | | | | | | |

M.E. / M.TECH. DEGREE EXAMINATIONS, MAY/JUNE 2017
FIRST SEMESTER

INTERNAL COMBUSTION ENGINEERING
IC16104 – COMBUSTION AND EMISSION IN ENGINES
(Regulation 2016)

Q. Code: 812195

Time: Three Hours **Maximum : 100 Marks**

Answer **ALL** questions

PART A - (10 X 2 = 20 Marks)

1. Define the term degree of dissociation.
2. Distinguish between laminar and turbulent burning velocity.
3. Write any four factors which promote flame propagation in S.I. engine combustion.
4. Write any four factors which induce knocking in S.I. engine combustion.
5. Define ignition delay in C.I. Engine.
6. Distinguish between cetane number and Octane number.
7. Give requirements of a combustor in gas turbine.
8. Distinguish between primary zone and secondary zone in turbine combustor.
9. Write any four causes of CO emission.
10. How do HC and CO emissions vary with air fuel ratio in S.I. Engine?

PART B - (5 X16 = 80 Marks)

11. (a) Determine the Adiabatic flame temperature of liquid Octane during reaction with 100 % theoretical air. **(16)**

(OR)

(b) Experiment measurement shows that in 1 mole of H_2O, 5 % is dissociated into H_2 and O_2 at a pressure of 10 bar. Calculate the equilibrium constant and also determine temperature. **(16)**

12. (a) With neat sketch explain the different stages of S.I. engine combustion. Also explain the factors affecting the different stages of combustion. **(16)**

(OR)

(b) With neat sketches, describe the various combustion chambers of S.I. engine. **(16)**

13. (a) Describe the factors which affect knocking in C.I. engine. Also compare C.I engine Knocking with S.I. engine Knocking. **(16)**

(OR)

(b) Compare Direct and indirect injection systems in C.I. engine. Also explain the effect of Injection pressure on C.I. engine combustion. **(16)**

14. (a) Compare different configurations of Gas turbine Combustion chamber. **(16)**

(OR)

(b) Discuss on Flame stability and Re-circulation zone in gas turbine. **(16)**

15. (a) Discuss the sources of formation of NOx and smoke emission in CI engine. Explain combustion modification methods to control the same. **(16)**

(OR)

(b) (i) Explain the sources of formation of UBHC and CO emission in S.I. and C.I. engines. **(8)**

(ii) Discuss the effect of various pollutants on environment and human beings. **(8)**