Reg. No. :

Question Paper Code : 11014

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

Fifth/Sixth/Seventh/Eighth Semester

Mechanical Engineering

CME394 — ADVANCED INTERNAL COMBUSTION ENGINEERING

(Common to : Mechanical Engineering (Sandwich))

(Regulations 2021)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you mean by abnormal combustion?
2. What is detonation?
3. List out the ways to control the diesel knock.
4. What do you mean by waste gate?
5. What are the methods of controlling the emissions using in-cylinder treatments?
6. State any two reasons for the malfunctioning of catalytic converter?
7. Write the demerits of alcohol fuels?
8. Write the advantages of hydrogen over CNG?
9. What do you mean by low temperature combustion?
10. Write the advantage of fuel cell over battery vehicle.

PART B — (5 × 13 = 65 marks)

11. (a) With neat sketches, discuss about the different types of fuel injection system of SI engines.

Or

(b) With neat sketch, explain in detail about the causes of knocking in SI engines.

12. (a) Discuss about the different types of Diesel fuel injection systems of CI engines.

Or

(b) With neat sketch, discuss the working of variable geometry turbocharging in CI engines.

13. (a) Explain about construction and working principle of selective catalytic reduction and Diesel oxidation catalyst to control the emission.

Or

(b) With neat sketch, discuss about the various methods of emission measurement.

14. (a) Discuss about the performance of the IC engine using hydrogen as fuel and challenges.

Or

(b) List out the properties of biogas and discuss about the engine modification for the utilization of biogas in SI and CI engine.

15. (a) Explain about the reactivity-controlled compression ignition process.

Or

(b) Discuss the suitability and working of hydrogen fuel cell.

PART C — (1 × 15 = 15 marks)

16. (a) Explain in detail about normal and abnormal combustion in SI engines.

Or

(b) Discuss about the different types of low temperature combustion modes.
