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Question Paper Code : 90844

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Sixth/Eighth Semester

Mechanical Engineering

ME 8091 – AUTOMOBILE ENGINEERING

(Common to : Mechanical Engineering (sandwich) / Mechatronics Engineering /
Robotics and Automation)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is integral body construction?
2. Mention the significance of camshaft.
3. List any two merits of a capacitive ignition system.
4. State the main function of a turbocharger.
5. What is wet type multi-plate clutch?
6. Sketch a differential and identify the associated components.
7. Compare and contrast between toe-in and toe-out.
8. Write any two merits of an independent suspension system.
9. What is the composition of Compressed Natural Gas?
10. Why does hydrogen in a liquid form stored in cryogenic temperatures?

PART B — (5 × 13 = 65 marks)

11. (a) With aid of a neat layout, describe the constructional details and power flow of a front-engine all-wheel-drive vehicle.

Or

- (b) With aid of an illustrative sketch, describe the working principle of the Variable Valve Actuation system.

12. (a) With aid of a neat sketch, explain the constructional details and working principle of a Gasoline Direct Injection system.

Or

- (b) With aid of a neat sketch, explain the constructional details and working principle of a Common Rail Direct Injection system.

13. (a) With aid of an illustrative sketch, elaborate upon the constructional details and working principle of a 3-element torque converter used in automatic vehicles.

Or

- (b) With aid of an illustrative sketch, elaborate upon the functions of a Hotchkiss type to rear drive and its associated components.

14. (a) With aid of a relevant sketch, explicate the working principle of a Hydraulic Power-assisted steering system.

Or

- (b) With aid of a relevant sketch, explicate the working principle of an Electronic Brakeforce Distribution system.

15. (a) Summarize any three techniques of using alcohol in diesel engines.

Or

- (b) With aid of a neat layout, explain the constructional details of an electric four-wheeler.

PART C — (1 × 15 = 15 marks)

16. (a) With aid of suitable sketches, explain the constructional details and working principle of an electromagnetic clutch.

Or

- (b) With aid of a suitable sketch, explain the constructional details and working principle of a 3 forward and 1 reverse speed constant mesh gearbox.