Register No.: ..... Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION (R), DECEMBER 2023

(2020 SCHEME)

Course Code : 20MET433

Course Name: Automotive Technology

Max. Marks : 100 **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. State the purpose of the following parts of an IC engine.
   a) Piston rings. b) Flywheel. c) camshaft and valve mechanism.
2. List the advantages of the MPFI system.
3. What is the need for a clutch and gearbox in an automobile?
4. List the properties of a good friction lining.
5. List the functions and requirements of the suspension system of an automobile.
6. What is sprung mass and unsprung mass? Why is unsprung mass kept as low as possible?
7. Write short notes on oversteer and understeer of the vehicle?
8. What purposes are served by “camber”.How is the vehicle stability affected by its improperness.
9. Write short notes on Adaptive cruise control.
10. Define SRS.

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) With a neat sketch explain turbo charging in automobiles . (7)
    b) What are the parameters that affect turbo lag?How can it be minimized? (7)

OR

12. a) With a neat figure explaining the CRDi system. How can it be compared with a conventional system? (7)
    b) Explain the formation of hydrocarbons (HC) , carbon monoxide (CO) and nitrogen oxides (NOx) in the engine exhaust. (7)

MODULE II

13. a) Explain,with the aid of neat sketch, the construction and working of a single plate clutch (7)

b) Distinguish between semi-centrifugal and fully automatic centrifugal clutch. (7)

OR

14. a) With a suitable sketch explain the working of a Synchromesh Gear Box. (7)

b) Explain the working of torque converters with a neat sketch. (7)

MODULE III

15. a) Explain the features of the McPherson strut suspension system with a neat sketch. (7)

b) What do you mean by body roll?How can it be minimized ? (7)

OR

16. a) With a neat block diagram explain the working of pneumatic brakes. (7)

b) What is the function of ABS? How does it work? (7)

MODULE IV

17. a) Explain rack and pinion steering systems used in automobiles, with neat figures. (7)

b) Compare parallel hybrid and Series hybrid layout of electric vehicles. (7)

OR

18. a) Discuss about different types of batteries used in electric vehicles. What are the advantages of a Fuel cell compared to conventional batteries? (7)

b) Explain principles of the power steering system and draw its constructional layout. (7)

MODULE V

19. a) Discuss the different types of security systems used in automobiles, with neat sketches. (7)

b) Describe automatic climate control. (7)

OR

20. a) Elucidate the methods to control aerodynamic lift in cars. (7)

b) Write notes on the following.

a)Halogen bulbs b) Fog lamps c)Power windows d) Need of wiring harness. (7)

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