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

**Question Paper Code : 51023**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Fifth/Seventh Semester

Aeronautical Engineering

OAT 551 — AUTOMOTIVE SYSTEMS

(Common to Aerospace Engineering/ Computer and Communication Engineering/ Electrical and Electronics Engineering/Electronics and Instrumentation Engineering/ Industrial Engineering/ Industrial Engineering and Management/Instrumentation and Control Engineering/ Manufacturing Engineering/Marine Engineering/Material Science and Engineering/Mechanical Engineering/ Mechanical Engineering (Sandwich)/Mechanical and Automation Engineering/ Mechatronics Engineering/Production Engineering/ Robotics and Automation/ Bio Technology/ Food Technology/ Pharmaceutical Technology)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define the purpose of IC engines.
2. State the functions of push rod and rocker arm.
3. Mention any four types of vehicle layout.
4. Define Vehicle Aerodynamics.
5. Compare Hotchkiss drive and Torque Tube drive.
6. List out the functions of a slip joint.
7. State the purpose of Master Cylinder in Brake system.
8. List out the types of stub axle.
9. Define hybrid vehicles.
10. Write any two advantages and disadvantages of Bio–Diesel.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss with neat sketch the working of electronically controlled gasoline injection system for SI engines. (13)

Or

(b) Explain the operational features of electronics engine management system with neat sketch. (13)

12. (a) Discuss front and rear wheel drive layout in detail with relevant sketches. (13)

Or

(b) What do you understand by backlash in steering gear? Sketch any one steering gear and explain the constructional features provided to adjust backlash. (13)

13. (a) Describe the working principle of fluid fly wheel with the help of a neat sketch. (13)

Or

(b) Explain with neat sketch the construction and working of epicyclic gear box. (13)

14. (a) With a neat sketch, explain the working principle of pneumatic suspension system. (13)

Or

(b) Illustrate the vehicle dynamics in anti–lock braking system with suitable sketches. (13)

15. (a) Discuss the engine modifications required to use alternate fuels in automobiles. (13)

Or

(b) Explain the construction and working principle of any two fuel cells in detail. (13)



PART C — (1 × 15 = 15 marks)

16. (a) Illustrate about working principle of single plate clutch also, Explain about gear shifting mechanism with neat diagram. (15)

Or

(b) Compare performance, emission and cost aspects of alternate fuels with conventional fuels for automobiles with real time examples. (15)

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