

## Automobile Engineering

1. Draw the layout of four wheeler vehicle, and explain how front wheel drive differs from rear wheel drive.
2. Describe different types of pistons. How two stroke pistons are differs from 4 stroke pistons of a vehicle?
3. What do you know about an Epicyclic gear box? How the over drive can be obtained in an epicyclic gear box, explain with neat sketch.
4. Discuss about different types of resistance? Describe the factors that affect the rolling resistance of a vehicle.
5. How the gear ratios of a named transmission system determined for a given vehicle.
6. How does aerodynamic lift and aerodynamic pitching moment affect the performance of a vehicle?
7. State and explain the essential differences in the valve timings of a high-speed and low speed 4-s cycle SI engine
8. What is volumetric efficiency? How does it affect the engine performance? Draw a curve between volumetric efficiency and speed of a 4-stroke cycle SI engine and discuss it.
9. Draw the valve timing diagram for 4-stroke and 2-stroke diesel engine.
10. Make comparison between constant mesh and synchromesh gear box.
11. Differentiate between flywheel and governor.
12. Why compound gear train preferred over the simple gear train for use in manual gear box?
13. What is volumetric efficiency? What is its effect on engine power and specific fuel consumption?
14. How will you classify the different types of automobiles? Explain the working of four wheel drive vehicle used in practice?

15. what is necessity of synchromesh gearbox in an automobile? Explain the working of synchronizer used in gear box with neat sketch.
16. Name different resistances encountered by a moving vehicle. How propelling power is related to these resistances?
17. What is supercharging? Why it is done and what are supercharging limits for CI engine?
18. Draw the curve for torque characteristics (T Vs N) for variable speed CI engine?
19. What do you mean by ' Valve' and ' Valve gear mechanism'?
20. What do you mean by gear ratio ?What is the significance of low and high gear ratios?
21. What is the necessity of gear box in automobile?
22. why maximum power and maximum torque is not produced at the same rpm in an engine?
23. What is an idler gear? Discuss its working.
24. What consideration is made in the design of a vehicle?
25. What are the main components of an internal combustion engine? Give their material of construction and their functions.
26. Draw the layout of a 4-wheeler vehicle. Explain how front wheel drive differs from rear wheel drive.
27. Design a sliding type of gear box to obtain following speed ratios:
  - Top Gear ratio = 1: 1
  - Third gear ratio = 1.4: 1
  - Second gear ratio = 2.24: 1
  - Reverse and first gear ratio = 3.8 : 1

Assume the countershaft speed = half that of engine speed

Assume the smallest gear to have not less than 15 teeth.
28. What do you know about braking efficiency in an automobile? Derive the relation of weight transfer when brakes are applied to all the four wheel.
29. Draw layout of any four wheeler automobile chassis. What design features are to be considered in making a chassis frame.

30. What is the advantage of air brake system over other brake system? Explain the working of Air brake system used in heavy vehicles.
31. Discuss the advantages of using a compensated or equalized type of suspension system.
32. What is brake effectiveness? What is the hydraulic braking system preferred over the mechanical braking system in heavy vehicles?
33. With help of neat sketch describe the working of a hydraulic braking system and used in vehicles.
34. Explain the functions of master cylinder used in hydraulic braking system with neat sketch.
35. Explain briefly the elements of a suspension system and discuss the bouncing, rolling and pitching suspension movement of cars.
36. Describe briefly of the following
- I. Torsion bars.
  - II. Tubeless tyres
  - III. Wheel balancing
  - IV. Classification of chassis.
37. What are the advantages of power brakes. Explain the working of pneumatic brake system.
38. What is the need of self energizing brake system? Explain the working of a self energizing brake with neat sketch.
39. Differentiate between the leaf-spring suspension and coil spring suspension system of front wheels used for Automobile vehicles. Describe an independent suspension system.
40. What are the requirements of good braking system? Discuss the classification of brakes for automotive vehicles.
41. What do you understand by independent suspension system? Explain wishbone arm system with neat sketch?
42. Write a short note on the following

I. Self energizing brakes

II. Causes of tyre wear

43. Explain the working of vacuum brake.

44. Discuss the load coming on a chassis frame. Explain various types of chassis frame sections and their suitability for chassis frame.

45. What is the need of suspension system? Explain the working of shock absorbers.

46. Explain the transfer of weight during braking on all the four wheels. How can the weight transfer be reduced?

47. Classify different types of brakes.

48. Explain working of vacuum servo brake.

49. What are the different types of motors used in automobiles? Explain the working of Bendix drive.

50. Draw the turning lift circuit for an automobile.

51. What is the function of generator, regulator in case of electrical system of automobile?

52. Name the various types of carburetors. What is the speciality of Zenith carburetor.

53. Why is it essential to use ignition system in petrol engine and fuel injection system in diesel engine.

54. Draw the layout of fuel supply system in case of diesel engine.

55. What is the advantage of an Electronic ignition system? Explain the working of any one of electronic ignition system.

56. Discuss the difference between the Multi point fuel injection system for an SI engine and carbureted fuel supply system for an SI engine.

57. Discuss the differences between the air-injection systems and fuel injection system used in CI engines.

58. When electric ignition system is preferred over conventional system? Make comparison between TCI and CDI ignition system.

59. What is the difference between air injection and solid injection? Explain the working of common rail and individual pump injection system with neat sketch. Discuss their relative merits and demerits.
60. Discuss electronic fuel injection system for petrol engine.
61. Draw the layout of diesel engine fuel supply system of an automobile. Explain the function of different components.
62. Write short notes on any two of the following:
- I. Head light system
  - II. Cut out
  - III. Spark Plugs
  - IV. Type of batteries used
63. Draw the diagram of simple two pole shunt wound generator. Why a generator is equipped with a cutout, explain with neat sketch.
64. Describe the main components and working of battery ignition system with neat sketch.
65. What are the functional requirements of diesel engine injection system? Describe different types of injection nozzles and compare them.
66. What are the advantages of MPFI over the carburettor system. Explain MPFI electronic control system with a block diagram.
67. Describe the working of a multi point electronic fuel injection system. What are the advantages of S.I engine fuel injection system.
68. Draw a simplified wiring circuit for lightning system of car and discuss the same.
69. Explain the working principle of Magneto-ignition system. How it is different from Battery ignition system.
70. What is the function of a starting drive? Describe the construction and working of one type of Bendix drive.
71. Describe the working of a jerk type diesel fuel injection pump with the help of a suitable sketch.
72. Explain the working of A.C Generator.

73. Discuss the working of Fuel injection system in petrol engines. UNIT – V

74. What is the need of cooling system in automobile engines? What type of cooling system is used in case of 4 wheeler drive Indian vehicles.

75. What is the need of lubrication in an automobile? Explain the working of a lubrication system used in automobile engine by neat sketch.

76. What do you know about break down maintenance? If a petrol vehicle stops on road explain the possibility of stopping the vehicle in sequence.