Code No: **R1642033** **R16** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

AUTOMOBILE ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) Write any four Differences between Turbo Charging and Super Charging. [2]
   b) Write a short note on Fluid Flywheel. [2]
   c) What is camber and Caster? Explain their significance in steering. [2]
   d) List the functions of an Automobile Suspension system. [2]
   e) Explain the working principle of Anti-lock Braking System. [3]
   f) Discuss the Mechanism of formation of NOx emissions from an automobile engine. [3]

PART–B *(4x14 = 56 Marks)*

2. a) Explain the working principle of Splash lubrication system, with the help of a neat sketch. [7]
   b) What is a four-wheel drive? Explain the different parts of the four-wheel drive with a neat layout diagram. [7]

3. a) With the help of a neat sketch, explain the construction and working of a multi-plate clutch. [7]
   b) Mention the Differences between synchro mesh gear box and epicyclic gear box. [7]

4. a) Explain Davis steering mechanism. [7]
   b) With the help of neat sketches, explain the working of different steering linkages. [7]

5. a) Discuss the requirements of braking fluids. [5]
   b) Explain with a schematic diagram, working of rigid axle front wheel suspension system [9]

6. a) Discuss in detail, the engine specifications with regard to power and speed. [7]
   b) Explain about central locking and electric windows? [7]

7. a) Discuss the tests that a crank shaft should be subjected to before re-assembly in a engine. [7]
   b) Write about the service details of valves and valve mechanism? [7]

Code No: **R1642033** **R16** **Set No. 2**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

AUTOMOBILE ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) Explain the working principle of Crank Case Ventilation [2]
   b) Differentiate between sliding mesh gear box and synchro mesh gear box [3]
   c) What is Toe-in and Toe-out? Explain. [2]
   d) Give the requirements of a good automobile braking system. [3]
   e) List the safety features of a modern automobiles? [2]
   f) What is a catalytic converter? Discuss its applications. [2]

PART–B *(4x14 = 56 Marks)*

2. a) What is a chassis? Explain the functions of chassis in an automobile. Give the classification of chassis. Explain any two. [7]
   b) Explain different methods of repairing an engine which has worn out cylinder walls. [7]

3. a) Draw a schematic diagram and explain the working of a torque convertor. [7]
   b) What is a tyre? Discuss the different types of tyres. Explain the differences between Radial and Bias tyres. [7]

4. a) Explain in detail about (i) center point steering and (ii) king pin rake. [7]
   b) Explain the term "Backlash" in Steering Gear. Write the common procedure adopted to adjust the backlash in steering gear [7]

5. a) What are the different types of automobile braking systems? Write short notes on pneumatic braking system with a neat sketch. [7]
   b) Mention the points to be considered while designing braking system of an automobile. Discuss the different types of braking systems. [7]

6. a) What do you understand by Anti-lock Braking System? Explain its working and mention its advantages over conventional braking system. [7]
   b) Write short notes on (i) Air bags and (ii) Bumper of an automobile. [7]

7. a) Explain service details of engine cylinder head? [7]
   b) Explain briefly the exhaust gas recirculation device for the control of NOx. [7]

Code No: **R1642033** **R16** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

AUTOMOBILE ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) What is Nitriding of Crank Shaft? Explain. [2]
   b) What is a Universal Joint? Where it is used? [2]
   c) Write short notes on kingpin rake in automobile steering. [2]
   d) Differentiate between Mechanical and Pneumatic braking systems of an automobile. [2]
   e) Write the need for cooling system for automobile engine. What are the effects of over cooling and under cooling of an engine on its performance. [3]
   f) Write a short note on the strategies to reduce the CO emissions from an Automobile engine. [3]

PART–B *(4x14 = 56 Marks)*

2. a) What is the importance of Lubrication in IC engines? What are the objectives of Lubrication? [5]
   b) Explain the working principle of Pressure lubrication system of a Diesel Engine, with the help of a neat sketch. [9]

3. a) What is a clutch? What are the functions of a clutch? Explain the functioning of a cone clutch with a neat sketch. [7]
   b) What are the different types of rare axles? Write a short note on any one of them with a neat sketch. [7]

4. a) Write the working principle of Ackerman steering mechanism with the help of a neat sketch. Mention its advantages and disadvantages. [7]
   b) Discuss in detail, the different nomenclature involved in steering geometry? [7]

5. a) Name the various electrical components used in an automobile & give their functions? [7]
   b) With the help of neat sketch, explain Independent suspension system. [7]

6. a) Explain with relevant sketches, working of central looking and electric windows in an automobile [6]
   b) What are various safety systems adopted for automobiles? Explain wind shield and speed control in detail. [8]

7. a) Explain about thermal and catalytic converters, with neat sketches. [7]
   b) Explain the use of alternative fuels for emission control? [7]

Code No: **R1642033** **R16** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

AUTOMOBILE ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) Differentiate between Front Wheel Drive and Rare wheel Drive. [3]
   b) What is the working principle of a Clutch and give its classification. [2]
   c) Difference between Ackerman steering mechanism and Davis steering mechanism. [2]
   d) Classify the different types of shock absorbers used in different automobiles. [3]
   e) Mention the necessity of a lubrication system for an engine. Discuss what will happen if it fails? [2]
   f) Explain why engine servicing is required? [2]

PART–B *(4x14 = 56 Marks)*

2. a) What is Turbo charging, Explain its working with the help of a neat sketch. Mention its effect on the performance of an engine. [7]
   b) Explain the factors that limit the extent of supercharging of S.I and C.I engines. [7]

3. a) Explain with a simple sketch, construction and working of differential in an automobile [7]
   b) What is a gearbox in an automobile? What are the types of automobile gear Box? Explain the working of a sliding mesh gear box with a neat sketch. [7]

4. a) Explain briefly the Worm and worm wheel steering gear. [7]
   b) Explain the steering geometry, with the help of neat sketch. [7]

5. a) Write a short note on torsion bar with the help of a neat sketch and mention its advantages and disadvantages. [7]
   b) Describe briefly a `tandem master cylinder` used in a hydraulic braking system. [7]

6. a) Discuss the engine specification with regard to number of cylinders and arrangement? [7]
   b) Explain the working principles of operation of mirrors and seat belt in an automobile with the help of a sketch. [7]

7. a) Briefly discuss the mechanism of formation of pollutants in automobile engine exhaust. [7]
   b) Discuss the different national and international emission standards is automobiles. [7]