

Code No:R1642033

# R16

Set No. 1

IV B.Tech II Semester Regular Examinations, September - 2020  
**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) List the components of four wheeler automobile. [2]
- b) State the types of clutches. [3]
- c) Define camber and castor. [2]
- d) Write about the requirements of brake fluid. [3]
- e) State the functions of air bags. [2]
- f) State the International pollution standards in brief. [2]

**PART-B**(4x14 = 56 Marks)

2. a) Illustrate about splash lubrication system with a neat sketch. [7]
- b) How does a two-stroke engine differ from a four-stroke engine? [7]
3. a) Explain the working of a universal joint and differential rear axles. [7]
- b) With the help of a neat sketch, explain the construction and operation of an epicyclic gearbox. [7]
4. Describe the Ackerman and Davis Steering Mechanisms. What are their relative merits? [14]
5. a) Explain about torsion bar and independent suspension system. [7]
- b) Write about the working of oil pressure gauge and engine temperature indicator. [7]
6. a) Explain about engine specifications with regard to lubrication and cooling. [7]
- b) Write about suspension sensors, traction control and speed control. [7]
7. a) Write about exhaust gas treatment using thermal converter. [7]
- b) Illustrate about the service details of engine cylinder head. [7]



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**PART-A(14 Marks)**

1. a) Define nitriding of crank shaft. [2]
- b) State the types of tyres. [3]
- c) List the types of steering mechanisms. [2]
- d) Name the various electrical components used in an automobile. [3]
- e) Write the functions of wind shield. [2]
- f) State the national pollution standards in brief. [2]

**PART-B(4x14 = 56 Marks)**

2. a) Describe how the power can be transmitted in front wheel drive by using a neat diagram. [7]
- b) Explain about oil filters and oil pumps with neat sketches. [7]
3. a) Sketch and explain the construction and working of torque converter. Bring out the differences between torque converter and fly wheel?. [7]
- b) Explain the working of magnetic and centrifugal clutches. [7]
4. a) Explain about the steering linkages with neat sketches. [7]
- b) Write about the steering geometry in detail. [7]
5. a) Explain about rigid axle suspension system with neat diagram. [7]
- b) Describe the working of mechanical brake system with neat sketch. [7]
6. a) Explain about engine specifications with regard to power. [7]
- b) Write about anti-lock brake system (ABS) and central locking safety system in detail. [7]
7. a) Explain about concentration measurement of engine emissions and exhaust gas treatment using catalytic converter. [7]
- b) Describe about service details of valves and valve mechanism. [7]

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**PART-A(14 Marks)**

1. a) Define crank case ventilation. [2]
- b) List the advantages of cone clutch. [3]
- c) State the advantages of Ackerman steering mechanism. [2]
- d) What are the objectives of employing a suspension system on an automobile? [3]
- e) State the functions of central locking safety system. [2]
- f) Write about the mechanism of emissions formation. [2]

**PART-B(4x14 = 56 Marks)**

2. a) Sketch a chassis of any four wheeler and mark various parts on it. [7]
- b) Explain about turbo charging and super charging. [7]
3. a) List out the functions to be performed by the transmission system of an automobile. [7]
- b) Explain the working of sliding mesh gear box with neat diagram. [7]
4. a) Explain the operation of King-Pin inclination for producing directional stability. [7]
- b) What is wheel alignment explain? Describe the cam and roller type of Steering Gear. [7]
5. a) Explain about the working of lighting systems, horn and wiper with neat diagram. [7]
- b) Describe about the working of hydraulic brake system. [7]
6. a) Explain about engine specifications with regard to speed and torque. [7]
- b) Write about the seat belt, air bags and bumper safety systems used in automobiles. [7]
7. a) Explain the use of alternative fuels for emission control. [7]
- b) Describe about service details of crank shaft and main bearings. [7]

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**PART-A**(14 Marks)

1. a) State the types of automobile engines. [2]
- b) What are the functions of universal joint? [3]
- c) State the advantages of Davis steering mechanism. [2]
- d) Write the functions of a cutout relay as used in the charging circuit. [3]
- e) List the various important engine specifications. [2]
- f) Name the types of pollutants. [2]

**PART-B**(4x14 = 56 Marks)

2. a) Explain about rear wheel drive with neat diagram. [7]
- b) Write about the working of pressure lubrication system in detail. [7]
3. a) Explain the working of cone clutch used in an automobile with a neat sketch. How a single plate clutch is better compared to cone clutch? [7]
- b) Explain the working of synchro mesh gear box with neat diagram. [7]
4. a) Illustrate about the types of steering gears. [7]
- b) Explain why do the front wheels have to toe-out in turns? Explain what is meant by center point steering? [7]
5. a) Explain about the working of pneumatic and vacuum brakes. [7]
- b) Describe about the bendix drive mechanism. [7]
6. a) Explain about engine specifications with regard to no. of cylinders and arrangement. [7]
- b) Write about wind shield and electric windows. [7]
7. a) Explain about methods of controlling emissions. [7]
- b) Describe about service details of piston-connecting rod assembly? [7]