

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: ME463
Course Name: Automobile Engineering

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks.

Marks

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| 1 | a) Distinguish between supercharged engine and turbocharged engines with neat sketches. | (6) |
| | b) What is turbo lag, how can turbo lag be reduced in turbo charged engines? | (4) |
| 2 | a) List out the functions of the following IC engine parts
(i) Piston (ii) Piston ring (iii) Flywheel (iv) Connecting rod (v) Crankshaft
(vi) Camshaft | (6) |
| | b) What is the purpose of front wing and rear wing in F1 racing car? | (4) |
| 3 | a) List out the factors affecting the maximum torque transmitting capacity of a friction clutch. | (4) |
| | b) With the help of a neat sketch explain the working of an overdrive unit used in automobiles. | (6) |
| 4 | a) Explain the working of synchromesh gear box engaged in any gear using a neat diagram. | (6) |
| | b) List out the different resistive forces a vehicle must overcome to keep moving at different driving conditions. | (4) |

PART B

Answer any three full questions, each carries 10 marks.

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| 5 | a) Explain the working of rack and pinion steering mechanism with a neat sketch | (6) |
| | b) What are the advantages of power assisted steering system with the other systems? | (4) |
| 6 | a) Derive for the perfect rolling condition in Ackerman steering mechanism with a neat sketch | (6) |
| | b) What is 'Under Steer' and 'Over Steer' in automobiles? | (4) |
| 7 | a) Explain the features of McPherson Strut suspension system with a sketch | (6) |
| | b) What are the functions and advantages of independent suspension systems? | (4) |

- 8 a) Illustrate the working of swing arm rear wheel drive independent suspension (7)
b) Define (i) Suspension roll centres (ii) Suspension roll axis (ii) Body roll stiffness (3)

PART C

Answer any four full questions, each carries 10 marks.

- 9 a) Explain the working of Front disc brakes in an automobile with a sketch (5)
b) Discuss the function & working of a Master cylinder assembly in brake system with a sketch (5)
- 10 a) Derive an expression for brake applied for the rear wheels and front wheels? (6)
b) What are the desirable properties of brake pad materials? (4)
- 11 a) Explain the working of vacuum brakes with a neat sketch (6)
b) What is the need of ABS? (4)
- 12 a) What is the effect of 'aerodynamic drag' on the efficiency of a vehicle (5)
b) Discuss the effect of 'Negative lift' of aerofoil wings on vehicles (5)
- 13 a) Discuss on the need and function of a rear end spoiler in a vehicle (5)
b) Explain on the concept of "Hatch back Drag" (5)
- 14 a) What are the methods to control the aerodynamic lift? (5)
b) How under body height affect the aerodynamic lift and drag? (5)
