

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 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

- |   |  |     |
|---|--|-----|
| 1 | a) With a neat sketch explain about turbo charging.  | (6) |
|   | b) Sketch a Piston ring in an IC engine. What are the functions of piston rings to perform in an engine? | (4) |
| 2 | a) Sketch and explain the function of a flywheel in an IC engine?  | (5) |
|   | b) Compare MPFI and CRDI systems   | (5) |
| 3 | a) Sketch and explain the working of a synchromesh gear box  | (5) |
|   | b) With a neat sketch explain pull type diaphragm clutch.  | (5) |
| 4 | a) Define overdrive. What are the advantages of overdrive?   | (5) |
|   | b) Explain the working of a fluid coupling with a neat sketch.   | (5) |

**PART B**

*Answer any three full questions, each carries 10 marks.*

- |   |  |     |
|---|--|-----|
| 5 | a) With a neat diagram explain the working of a hydraulic rack and pinion steering system. | (6) |
|   | b) List out the need of power steering system in a vehicle.                                | (4) |
| 6 | a) Explain caster in steering wheel alignment with a neat sketch.                          | (6) |
|   | b) Explain Ackermann steering mechanism with a neat sketch.                                | (4) |
| 7 | a) Explain telescopic suspension with a neat sketch.                                       | (5) |
|   | b) With the help of a diagram explain short swing arm suspension.                          | (5) |
| 8 | a) List out the advantages and disadvantages of hydro pneumatic suspension.                | (6) |
|   | b) List out the functions of anti roll bars.   | (4) |

**PART C**

*Answer any four full questions, each carries 10 marks.*

- |   |  |     |
|---|--|-----|
| 9 | a) With a neat diagram explain the working of a disc brake system. | (8) |
|---|--|-----|

- b) What is the purpose of braking system? (2)
- 10 a) Explain mechanical braking system with sketch (6)
- b) What is braking efficiency? List out the factors affecting braking (4)
- 11 a) With a neat block diagram explain the working of pneumatic brake. (6)
- b) List out the advantages of ABS. (5)
- 12 a) What is the significance of aerodynamic lift in vehicles? (5)
- b) Explain the importance of under body dams in aerodynamic lift control of vehicle (5)
- 13 a) What is drag coefficient? (2)
- b) With neat sketches explain the drag coefficients of body shapes (8)
  - i) sphere      ii) cube      iii) sixty degree cone      iv) tear drop
- 14 a) Explain profile edge chamfering in vehicles sketches. (5)
- b) What is the need of a rear end spoiler in a vehicle? (5)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Seventh semester B.Tech examinations (S), September 2020

**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

- |   |   |     |
|---|---|-----|
| 1 | a) Distinguish between MPFI and CRDI systems with its need and advantages.                                  | (5) |
|   | b) Explain the working and benefits of turbocharger with a sketch.  | (5) |
| 2 | a) Explain the function of the following components in an automobile<br>(1) Compression Rings (2) Fly wheel | (5) |
|   | b) Compare the performance and working of naturally aspirated engines and super charged engines.            | (5) |
| 3 | a) Explain the working of a torque convertor in an automobile and list its benefits.                        | (5) |
|   | b) Sketch and explain the working of a multi plate clutch in an automobile.                                 | (5) |
| 4 | a) Draw the sketch and function of an Over drive mechanism.   | (5) |
|   | b) Sketch and explain the working of synchromesh gearbox.   | (5) |

**PART B***Answer any three full questions, each carries 10 marks.*

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|---|---|-----|
| 5 | a) Explain the effect of incorrect Toe (Toe-in and Toe-out) in a vehicle                            | (5) |
|   | b) Sketch and explain the working of a power assisted rack and pinion steering system.              | (5) |
| 6 | a) Sketch and explain the working of worm and roller steering gearbox system.                       | (5) |
|   | b) Explain the importance of the following steering angles (1) Caster (2) Camber                    | (5) |
| 7 | a) Sketch a McPherson strut suspension system and list its advantages.                              | (5) |
|   | b) Compare the features of (1) Non independent suspension system (2) Independent Suspension systems | (5) |
| 8 | a) Sketch and explain the features of Double Wish Bone suspension system.                           | (5) |
|   | b) Sketch and explain the function of an Antiroll Bar in a car.                                     | (5) |

**PART C**

*Answer any four full questions, each carries 10 marks.*

- 9 a) Explain the working of a hydraulic brake system with a sketch. (5)  
b) How braking efficiency of a vehicle is evaluated? What are the parameters that affect braking efficiency? (5)
- 10 a) Compare the working of vacuum brakes and hydraulic brakes. (5)  
b) Write a note on laying brake line systems for providing braking in all four wheels of a vehicle? (5)
- 11 a) Discuss the working and advantages of ABS braking system over conventional systems. (5)  
b) Explain the working of a Brake Caliper with a sketch. (5)
- 12 a) Write a note on the influence of shape of vehicles on drag coefficients. (5)  
b) How does under body floor height influences aerodynamic lift of a vehicle? (5)
- 13 a) Explain the function and advantages of rear end spoiler in a vehicle. (5)  
b) List and explain any two methods to control aerodynamic lift in a vehicle. (5)
- 14 a) Explain any two methods to reduce drag of a car body. (5)  
b) Differentiate between fast back drag and hatch back drag. (5)

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