

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

**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 neat sketches explain MPFI and CRDI system of fuel injection. Highlight the major differences between the two. (6)  | (6) |
|   | b) With the help of neat sketch, explain how oil control ring helps in piston lubrication? (4)  | (4) |
| 2 | a) List out the functions of the following IC engine parts (i) Piston Pin (ii) Connecting Rod (iii) Push rod (iv) Flywheel (v) Cylinder Liner (vi) Piezoelectric injector (6) | (6) |
|   | b) List any four aerodynamic features of the F1 racing car (4)  | (4) |
| 3 | a) Distinguish between semi-centrifugal and fully automatic centrifugal clutch (4)  | (4) |
|   | b) Explain the working of torque converters with neat sketch. (6)   | (6) |
| 4 | a) With the help of a neat sketch explain the working of an overdrive unit used in automobiles. (6)   | (6) |
|   | b) What is the need for clutch and gear box in an automobile? (4)   | (4) |

**PART B**

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

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|---|--|-----|
| 5 | a) Explain with the help of neat figure working of recirculating ball nut steering gear box? (6) | (6) |
|   | b) What is caster, camber, toe in and toe out? (4)   | (4) |
| 6 | a) Explain the working of Rack and Pinion steering mechanism with a neat sketch (6)              | (6) |
|   | b) What are the advantages of power assisted steering system with the other systems? (4)         | (4) |
| 7 | a) What is 'Body Roll' in Cars? How is it controlled? (5)  | (5) |
|   | b) Explain the function & advantages of Double Wishbone suspension (5)                           | (5) |
| 8 | a) Explain with the help of a neat figure working of a semi trailing arm suspension system? (6)  | (6) |
|   | b) Differentiate body roll couple and body over turning couple? (4)                              | (4) |

**PART C**

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

- 9 a) Explain in detail the function and working of ABS brake system with neat sketch. (6)
- b) Discuss the features and advantages of ABS system over hydraulic brake systems (4)
- 10 a) Explain the working of vacuum brakes with a sketch (6)
- b) Compare the features of hydraulic and pneumatic brake systems (4)
- 11 a) With the help of a neat diagram explain the working of internal expanding brake shoes? (6)
- b) Explain the working of a Master cylinder assembly in brake system. (4)
- 12 a) Discuss on the effect of 'under body floor height' on aerodynamic lift & drag of a vehicle (5)
- b) Does 'profile edge chamfering' improves drag-Explain (5)
- 13 a) Explain on the effect of side panel chamfering on drag (5)
- b) Write a note on the concept of Square back drag (5)
- 14 a) What are the various methods to reduce the car drag? (5)
- b) What are the functions of negative lift aerofoil wings? (5)

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