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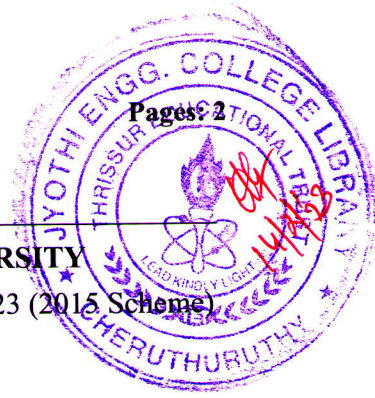
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Reg No.: \_\_\_\_\_

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Seventh Semester B.Tech Degree (S, FE) Examination January 2023 (2015 Scheme)



**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 the help of a neat sketch explain the different parts of an IC engine piston. (8)
- b) Name the two different types of piston rings used in IC engines (2)
- 2 a) With a neat sketch, explain the working of a turbocharger and state how it differs from supercharger. (10)
- 3 a) With the help of a neat sketch explain the working of a single plate clutch system. (10)
- 4 a) List out the factors affecting the clutch worn out (6)
- b) What is the basic principle behind hydrodynamic coupling? (4)

**PART B**

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

- 5 a) What is the function of a steering gear box? List the different types of steering boxes used. (4)
- b) Explain the principle of Ackerman steering system. (6)
- 6 a) Explain briefly about the different angles that determines the steering geometry (5)
- b) Explain the working of a recirculating ball rack type steering gear box. (5)
- 7 a) Explain anti-roll bar operating principle. (5)
- b) Explain about the working of Macpherson suspension (5)
- 8 a) With the help of a neat sketch explain rear wheel drive independent suspension. (5)
- b) Explain the working of a shock absorber with a sketch (5)

**PART C**

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

- 9 a) With the help of a neat sketch explain air operated disc brake (5)
- b) Explain the working principle of a master cylinder assembly (5)

- 10 a) With the help of a neat sketch explain the working of mechanical brake (5)  
b) What are the advantages of ABS brake system (5)
- 11 a) Sketch and explain the working of a vacuum assisted brake system (5)  
b) List the advantages of air over hydraulic braking systems (5)
- 12 a) Explain effect of shape of a vehicle on its aerodynamic drag. (5)  
b) Explain square back drag in vehicles (5)
- 13 a) List out the definitions of the following aerodynamic terms in automobile (10)  
(i) Air resistance (ii) Pressure drag (iii) Vortices (iv) Vehicle lift  
(v) Trailing vortex drag
- 14 a) Explain the methods to reduce the drag (5)  
b) What are the functions of a spoiler in a car (5)

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