Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S7 (S, FE) / S7 (PT) (S, FE) Examination December 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)	Explain with neat sketches the types of piston rings.	(6)
	b)	Draw a neat sketch of connecting rod showing all the important parts.	(4)
2	a)	Explain the working of common rail direct injection system using a neat diagram showing all the parts.	(6)
	b)	Describe the working of supercharger with diagram.	(4)
3	a)	Explain the working of synchromesh gearbox with neat sketches showing all the important parts.	(6)
	b)	Discuss the constructional details of sliding mesh gearbox with sketches.	(4)
4	a)	Discuss the working of torque converter with sketches.	(6)
	b)	Draw a neat sketch of clutch plate showing its important parts.	(4)

PART B

Answer any three full questions, each carries 10 marks.

5	a)	Define the following terms using relevant diagram	(6)
		(i) Camber angle (ii) Castor angle (iii) Kingpin inclination	
	b)	Describe worm and roller type steering gearbox with neat sketches.	(4)
6	a)	Explain the working of hydraulic power assisted steering system with relevant diagram.	(6)
	b)	Explain the terms *over steer* and *under steer*.	(4)
7	a)	Describe the working of double wishbone suspension system with neat sketches.	(5)
	b)	Explain the working of Macpherson strut suspension system with sketches.	(5)
8	a)	Discuss the functions of antiroll bar in the suspension system with relevant diagram.	(5)

b) Define the following terms in suspension system (5)

    (i)   Body roll couple

    (ii)   Body roll stiffness

PART C

Answer any four full questions, each carries 10 marks.

9 a) Explain the working of internal expanding shoe brakes with diagram. (6)

    b) Enumerate the materials and properties of good friction lining materials in brakes. (4)

10 a) Describe the working of vacuum assisted brake servo with neat diagram. (5)

    b) Explain the working of antilock braking system in automobiles. (5)

11 a) Draw a schematic diagram of air operated brake system and explain its working. (5)

    b) Explain the working of hydraulic servo assisted brake system with diagram. (5)

12 a) Explain the following related to aerodynamics in vehicles (6)

    (i)   Trailing vortex drag

    (ii)   Attached transverse vortices

    b) Define the terms *aerodynamic drag* and *aerodynamic lift*. (4)

13 a) What do you mean by *square back drag* and *notch back drag* associated with aerodynamics? (5)

    b) Discuss the effect of underbody dams and exposed wheel in aerodynamic lift control. (5)

14 a) Explain any two methods commonly used to reduce car body drag with relevant diagram. (6)

    b) Describe the effect of rear end tail extension in aerodynamic drag. (4)

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