

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Seventh Semester B.Tech Degree Regular and Supplementary Examination December 2021 (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 functions and classification of piston rings. (6)
- b) Explain the functions of the following components with sketches. (4)  
(i) Connecting rod (ii) Crankshaft
- 2 a) Describe the working of CRDI engine system with neat diagram. (5)
- b) Discuss the working of turbocharger and supercharger with relevant diagram. (5)
- 3 a) With sketches, explain the working of diaphragm clutch. List the materials used as friction lining in clutches. (6)
- b) Explain the working of centrifugal clutch showing its constructional details. (4)
- 4 a) Explain the working of torque converter with sketches. (6)
- b) What do you mean by overdrive? List the advantages of overdrive. (4)

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

- 5 a) Define the following terms used in steering: (10)
  - (i) Over steer.
  - (ii) Caster.
  - (iii) Camber.
  - (iv) Slip angle.
  - (v) King Pin Inclination.
- 6 a) Discuss the working of hydraulic rack and pinion power steering system with neat sketches. (5)
- b) Explain the working of worm and roller type steering gear box with sketches. (5)
- 7 a) With sketches explain the working of Macpherson strut suspension. (5)
- b) Discuss the working of telescopic shock absorber with diagram. List its advantages. (5)

- 8 a) Discuss the working principle and functions of anti-roll bar in automobile with diagram. (5)
- b) With the help of a diagram discuss trailing arm rear wheel drive independent suspension. (5)

**PART C**

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

- 9 a) With a neat diagram explain the working of drum brakes. (5)
- b) Explain the working of antilock braking system with relevant diagram. (5)
- 10 a) Explain the working of disc brake with sketches. (5)
- b) With a neat sketch explain the working of master cylinder in hydraulic braking system. (5)
- 11 a) Discuss the working of vacuum assisted brake servo system with relevant diagram. (5)
- b) Explain the working principle of electronic pneumatic brakes with neat diagram. (5)
- 12 a) Define the following terms used in vehicle aerodynamics: (5)
- (a) Drag coefficient
  - (b) Lift Coefficient
- b) Discuss the following drag in vehicle dynamics with relevant sketches: (5)
- (i) Hatchback drag
  - (ii) Fastback drag
- 13 a) Discuss the effect of underbody height in the aerodynamic lift and drag of vehicles (5)
- b) What is the effect of 'profile edge chamfering' and 'Bonnet slope' on car body drag reduction. (5)
- 14 a) Explain the function of rear end spoiler in vehicles with neat sketches. (5)
- b) What is the effect of rear end tail extension on drag coefficient? (5)

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