



# 17614

**16172**

**3 Hours / 100 Marks**

Seat No.

--	--	--	--	--	--	--	--

- Instructions :** (1) *All questions are compulsory.*  
(2) *Answer each next main question on a new page.*  
(3) *Illustrate your answers with neat sketches wherever necessary.*  
(4) *Figures to the right indicate full marks.*

**Marks**

- 1. A) Attempt any three :** **12**
- a) Enlist the main requirement of Gear box.
  - b) Define Toe-in and Toe-out with neat sketch.
  - c) Classify automobile vehicles on the basis of use, capacity, wheels and drive.
  - d) Enlist various types of vehicle layouts.
- B) Attempt any one :** **6**
- a) Define aerodynamics ? Why aerodynamic aspects are considered while designing the body of a vehicle ?
  - b) With neat sketch explain working of synchromesh gear box and its advantages.
- 2. Attempt any four :** **16**
- a) Explain construction and working of differential and its advantages.
  - b) Define the term power steering. Enlist the types of steering gear box and its advantages.
  - c) Explain construction and working of Mcpherson strut assembly.
  - d) Differentiate between welding and joining processes in car body manufacturing.
  - e) State the design considerations for jig and fixture.
  - f) Write down design procedure for simple fixtures used in milling.
- 3. Attempt any four :** **16**
- a) Explain types of front axle used in the vehicle.
  - b) Explain with neat sketch of rock and pinion gear box used in the automobile.
  - c) With neat sketch explain the working of telescopic shock absorber.
  - d) Explain any two manufacturing processes used for production of connecting rod.
  - e) State the application of different types of drilling jigs.

**P.T.O.**



4. A) Attempt **any three** of the following : 12
- a) Explain with neat sketch working of propeller shaft with its universal and sliding joints.
  - b) Compare between hydraulic brake and pneumatic brake (Any four points).
  - c) What is the necessity of suspension system in the automobile.
  - d) Explain hardening and pre-stressing processes in the manufacturing of Leaf spring.
- B) Attempt **any one** of the following : 6
- a) What are the various types of locators ? Explain any two with neat sketch.
  - b) Explain forging and heat treatment processes in manufacturing of crank shaft.
5. Attempt **any four** of the following : 16
- a) Explain construction and working of coil spring clutch.
  - b) State the advantages of disk brakes used in automobile.
  - c) Explain construction and working of wishbone suspension system.
  - d) Explain piston die-casting manufacturing process for cylinder block.
  - e) Write down special clamping devices used in design of milling fixture.
  - f) Explain following manufacturing process for leaf spring final assembly and painting.
6. Attempt **any four** of the following : 16
- a) Write down the principles of fixture and jig design.
  - b) Describe construction and working of independent suspension system.
  - c) Differentiate the drum brake and disk brakes used in the automobile.
  - d) Explain construction and working of epicyclic gear box used in the automobile.
  - e) What are essential components of milling fixtures ? Explain any two with sketch.
-