

# 17409

**14115**

**3 Hours / 100 Marks**

Seat No.

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- 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.  
(5) Assume suitable data, if necessary.

**Marks**

1. a) **Attempt any SIX of the following:** **12**
- (i) State the functions of front axle.
  - (ii) State the functions of drop arm and drag link.
  - (iii) What is brake fade.
  - (iv) State necessity of car air-conditioning system.
  - (v) Define gradient resistance and write its expression.
  - (vi) State any four components of hydraulic braking system.
  - (vii) Draw a neat sketch of semi elliptical leaf spring and label it.
  - (viii) State requirements of steering system.

P.T.O.

b) **Attempt any TWO of the following:****08**

- (i) Draw any four body styles used for cars.
- (ii) Describe aluminium and plastics as body materials.
- (iii) Define:
  - 1) Air resistance
  - 2) Rolling resistance

**2. Attempt any FOUR of the following:****16**

- a) Describe parallelogram type steering linkages with neat sketch.
- b) Describe king pin inclination with neat sketch.
- c) State atleast four advantages of power steering.
- d) State use of calliper in disc brake and state any two disadvantages of disc brake.
- e) State painting procedure for new vehicles.
- f) State functions of brake and classify brakes.

**3. Attempt any FOUR of the following:****16**

- a) Distinguish between air brakes and hydraulic brakes. (any four points)
- b) Describe any two essential properties of brake fluid.
- c) Compare wishbone type suspension with Macpherson strut type suspension.
- d) State role of dehydrator and evaporator in Air-conditioning system.
- e) Describe working of exhaust brake with neat sketch.
- f) State any two advantages and two dis-advantages of central locking system.

- 4. Attempt any TWO of the following: 16**
- a) State caster, camber, toe in - toe out and turning radius with neat sketch.
  - b) Describe working of servo master cylinder with neat sketch.
  - c) Draw neat labelled lay out of air suspension and state the advantages of air suspension.
- 5. Attempt any FOUR of the following: 16**
- a) State any four advantages of rack and pinion type steering gear.
  - b) State importance of collapsible steering and state its types.
  - c) State two advantages and two disadvantages of torsion bar.
  - d) State any four desirable properties of refrigerant.
  - e) State the functions and types of shock absorbers.
  - f) Draw a labelled layout of HVAC.
- 6. Attempt any TWO of the following: 16**
- a) Describe working of Air-bag as a safety device also state function, material and locations of air bags in an automobile.
  - b) How temperature and humidity is controlled in car air conditioning.
  - c) Define Rolling, Pitching, Bouncing, Yawing and state effect of each on automobile.
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