

# 17409

16117

**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.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

1. a) **Attempt any SIX of the following:** **12**
- (i) Define - live axle and dead axle.
- (ii) Draw a neat labelled sketch of Elliot type of stub axle.
- (iii) List any two functions of braking system.
- (iv) Name any four components of air conditioning system used in car.
- (v) Define - Air Resistance and Rolling Resistance.
- (vi) State the two functions of parking brake.
- (vii) List the four types of steering gear box.
- (viii) State two functions of suspension systems.

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b) **Attempt any TWO of the following:****8**

- (i) Explain the working of collapsible steering with neat labelled sketch.
- (ii) Define -
  - 1) Drawbar pull
  - 2) Gradeability
- (iii) Explain the working of exhaust brake with neat sketch.

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

- a) What is the effect of castor and camber on stability of vehicle.
- b) Draw a labelled sketch of Rack and Pinion type of steering gear box.
- c) Explain the Ackerman steering mechanism with neat labelled sketch.
- d) Describe the working of air braking system with neat labelled sketch.
- e) Explain protective treatment for vehicle.
- f) Draw a neat labelled sketch of drum brake.

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

- a) Explain working of disc brake with neat labelled sketch.
- b) Define coefficient of friction and list the material used for brake liner.
- c) Compare air suspension system over rigid suspension system. (any four points).
- d) How temperature and humidity is controlled in car airconditioning.
- e) List the types of material used in body construction.
- f) Write two advantages and two disadvantages of central locking.

- 4. Attempt any TWO of the following:** **16**
- a) Draw a neat labelled sketch of worm and roller type steering gear box and explain its working.
  - b) Describe the hydraulic operated air braking system with neat labelled sketch.
  - c) Explain the working of Telescopic Shock Absorber with neat labelled sketch.
- 5. Attempt any FOUR of the following:** **16**
- a) State four advantages of power steering.
  - b) Describe the painting procedure for new vehicles.
  - c) Draw a neat labelled sketch of wishbone type Independent suspension system.
  - d) List four properties of Refrigerant.
  - e) Name the types of spring and draw any one.
  - f) Draw a layout of HVAC.
- 6. Attempt any TWO of the following:** **16**
- a) Explain the working of air bag used in automobile. State the material and location of air bags.
  - b) Draw a layout of vapour compression cycle and explain its working.
  - c) Describe stability of vehicle on slope
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