Instructions:

(1) All Questions are compulsory.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

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

1. **Attempt any THREE**: 12

   (a) State the necessity of transmission system in automobile.

   (b) State the various requirements of automobile body.

   (c) Define the following and state general range of angles used:

      (i) Castor, (ii) Camber.

   (d) State the classification of brakes and braking systems.

**Marks**

**2. **Attempt any ONE**: 6

   (a) Sketch and explain chassis layout of front engine rear wheel drive.

   (b) (i) State the functions of clutch.

      (ii) Explain with neat sketch, the working of Diaphragm type clutch.

2. **Attempt any FOUR**: 16

(a) State the various types of automobile bodies.

(b) Explain with neat sketch, Hotchkiss drive.

(c) (i) State the function of slip joint provided on propeller shaft.

(ii) State the necessity of universal joints used in propeller shaft.

(d) Explain with neat sketch working of constant mesh gear box.

(e) Compare hydraulic braking system and pneumatic braking system. (any four points)

3. **Attempt any TWO**: 16

(a) State the need of differential. Explain with neat sketch construction and working of differential.

(b) Explain the working of rack and pinion type steering gearbox with neat sketch. Also state its advantages.

(c) Describe pneumatic braking system with neat sketch and state its advantages.

4. **(A) Attempt any THREE**: 12

(a) Differentiate between radial and cross ply tyres.

(b) State the function of helper spring and shackle in leaf spring.

(c) Describe wire harness. State any four colour codes used in wiring system of automobiles.

(d) Explain battery ignition system with neat sketch.
(B) Attempt any ONE of the following :

(a) Draw a layout of an air-conditioning system of a car and explain its working.

(b) (i) State the important precautions to be taken while using air-conditioning system of a vehicle. (any four)


5. Attempt any FOUR :

(a) Explain the importance of aerodynamic shape of a car body.

(b) Explain with neat sketch, working of telescopic shock absorber.

(c) Explain with neat sketch, Bendix drive used in starting system.

(d) State the necessity of wheel alignment and wheel balancing.

(e) Name any four major components of automobile and state their function.

6. Attempt any TWO :

(a) Describe construction of MacPherson suspension system. State its advantages.

(b) Describe with neat sketch construction and working of lead acid battery.

(c) Explain construction and working of alternator with neat sketch.