

# 17307

**14115**

**3 Hours / 100 Marks**

Seat No.

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- 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) 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) Why is the Frame narrow at the front?
  - (ii) What are the loads acting on the Chassis Frame?
  - (iii) State the functions of the Frame.
  - (iv) State the materials for clutch lining.
  - (v) State the types of Gear Boxes.
  - (vi) Why hallow propeller shaft is used for transmission?
  - (vii) What is function of differential gears?
  - (viii) What is differential lock?

P.T.O.

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

- (i) Classify vehicle layout with respect to:
  - 1) Location of engine
  - 2) No. of live axles
  - 3) Arrangement of engine
  - 4) Application.
- (ii) Draw a neat labelled sketch of clutch used in heavy vehicle.
- (iii) State two applications of multiplate clutch and centrifugal clutch.

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

- a) Compare between a dry clutch and wet clutch on the basis of construction, torque transmission, heat dissipation and application.
- b) Explain construction and working of clutch plate with neat sketch.
- c) Explain hydraulic clutch operation mechanism with the help of block diagram.
- d) Explain construction and working of fluid coupling with neat sketch.
- e) Explain the working of clutch used in two wheeler vehicle.
- f) Draw a neat labelled sketch of sliding mesh gear box in reverse gear engaged position.

- 3. Attempt any FOUR of the following:** **16**
- a) Explain with neat sketch construction and working of torque converter.
  - b) Explain with sketch synchromesh device used in gear box.
  - c) Draw a labelled sketch of gear selector mechanism with gear lever on top of gear box.
  - d) Explain construction and working of transfer case with neat sketch.
  - e) What is double declutching? Explain.
  - f) Explain Hotchkiss drive used in vehicle.
- 4. Attempt any FOUR of the following:** **16**
- a) What is the difference between three speed and four speed gearbox? Where are these used?
  - b) Describe with neat sketch construction and working of propeller shaft.
  - c) Explain loads acting on rear axle.
  - d) Explain banjo type rear axle casing.
  - e) What is the tyre rotation procedure for heavy vehicles? Explain it with a neat sketch.
  - f) Explain disc type wheels with neat sketch.

- 5. Attempt any TWO of the following:** **16**
- a) State and explain type of constant velocity joints with neat sketch.
  - b) Explain construction and working of differential with neat sketch.
  - c) Explain with neat sketch following type of rear axle:
    - (i) Semi floating
    - (ii) Full floating type.
- 6. Attempt any TWO of the following:** **16**
- a) Draw a neat labelled diagram of four wheel drive vehicle layout. State two merits and two demerits of four wheel drive over two wheel drive vehicle layout.
  - b) (i) Write four advantages of radial ply tyres over the bias ply tyres.  
(ii) Distinguish between tube tyre and tubeless tyre on the basis of weight, fuel efficiency, life and road holding.
  - c) (i) What are the effects of high inflation pressure in tyres?  
(ii) Explain specifications of tyres with the help of example.
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