

22309

**11920**

**3 Hours / 70 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :**

**10**

- (a) List any four functions of the frame.
- (b) State the types of cross members used in conventional type chassis frame.
- (c) State the necessity of Clutch in Automobile.
- (d) State the principle of operation of the gear box in terms of Torque, Speed and diameter of the gears.
- (e) State the function of slip joint in propeller shaft.
- (f) State the loads acting on the rear axle.
- (g) Define Aspect ratio for tyre.

- 2. Attempt any THREE of the following : 12**
- (a) Differentiate between Conventional and Integral type chassis frame. (Any 4 points)
  - (b) Draw a neat sketch of hydraulically operated clutch and label all the parts.
  - (c) Draw the power flow diagrams for a 3 forward and reverse speed for sliding mesh gear box and describe the power flow in Second gear condition.
  - (d) Differentiate between Hotchkiss Drive and Torque tube drive in Automobile. (Any 4 points)
- 3. Attempt any THREE of the following : 12**
- (a) State the loads acting on a frame.
  - (b) Draw a neat layout of front engine front wheel drive and label it.
  - (c) State the location and function of Torsion damper spring and pressure spring in a single plate dry disc clutch.
  - (d) Describe the necessity of Gear box in Automobile.
- 4. Attempt any THREE of the following : 12**
- (a) Distinguish between single plate and multiplate clutch. (Any 4 points)
  - (b) Describe working of centrifugal clutch with neat sketch.
  - (c) State wherein the following clutch is used in Automobiles :
    - 1. Multiplate wet Clutch
    - 2. Diaphragm Clutch
    - 3. Centrifugal Clutch
    - 4. Fluid Coupling
  - (d) Describe working of variator drive with neat sketch.
  - (e) Draw a neat sketch of Transfer case arrangement. Label all the parts and state the application of transfer case in Automobiles.

- 5. Attempt any TWO of the following :** **12**
- (a) Compare constant mesh gear box with synchromesh gear box. (Any 4)
  - (b) Draw a neat sketch of a hollow propeller shaft. Label all the parts and state the necessity of Universal joint.
  - (c) Draw a neat sketch of full floating rear axle. Label all the parts. State an application of Semi floating, three quarter floating and full floating rear axle.
- 6. Attempt any TWO of the following :** **12**
- (a) State the necessity of Differential on a vehicle. Draw a neat sketch of the Differential unit and label all the parts.
  - (b) State the effect of inflation pressure on the life of the tyre. With a sketch, explain tyre rotation procedure and its necessity.
  - (c) Differentiate between cross ply and radial-ply type. (Any 6 points)
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