B.TECH
(SEM V) THEORY EXAMINATION 2022-23
AUTOMOTIVE CHASSIS AND SUSPENSION

Time: 3 Hours   *Total Marks: 100*

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1.   **Attempt** *all* **questions in brief.**   **2 x 10 = 20**

(a) State the different types of chassis based on power plant location.

(b) List the different types of the frame.

(c) Describe the necessity of gear box in a vehicle.

(d) Explain the term constant velocity joints.

(e) Discuss the function of brake adjuster in drum brake.

(f) Explain ride and handling.

(g) Describe the term camber and caster.

(h) Differentiate between reversible and irreversible steering.

(i) Describe the factors that affect tyre life.

(j) Explain the term traction control system.

SECTION B

2.   **Attempt any** *three* **of the following:**   **10 x 3 = 30**

(a) Describe the layout of rear engine rear wheel drive with the help of neat sketch. Also list its advantages and disadvantages.

(b) Describe the construction and working of differential gearbox with neat sketch.

(c) Discuss the construction and working of disc brake in a vehicle.

(d) Explain the different types of rear axle shaft supporting types.

(e) Describe the different types of wheels in a vehicle.

SECTION C

3.   **Attempt any** *one* **part of the following:**   **10 x 1 = 10**

(a) Explain the different cross-sections used for construction of the frame.

(b) Describe the different types of loads acting on the frame.

4.   **Attempt any** *one* **part of the following:**   **10 x 1 = 10**

(a) Discuss the construction and working of sliding mesh gearbox.

(b) The design is required to be made of a sliding mesh gear box with approximate gear ratios in forward speeds as 1.0, 1.5 and 2.5 and in reverse speed as 3.2. The diametral pitch of each gear is 4 mm and the smallest pinion is to have at least 12 teeth. The centre distance between the layshaft and main shaft is 84 mm. Calculate the suitable number of teeth on different gears and exact gear ratio's thus available.

5. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Describe the construction and working of gas filled shock absorbers.

(b) An automobile with wheel base 2.5m, the centre of gravity lies 0.8 m above the ground and 1.2 m in front of rear axle. The descends a hill with incline whose sine is equal to 0.1 Take the coefficient of friction as 0.6 and speed of automobile as 54km/hr., when only front wheels are braked, Evaluate the stopping distance and reaction at each wheels. Assume weight of vehicle as 15000 N.

6. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Explain slip angle, oversteer and understeer. How oversteering and understeering can be prevented.

(b) Discuss the Ackermann steering mechanism with the help of neat sketch.

7. **Attempt any *one* part of the following:** **10 x 1 = 10**

(a) Explain in detail the concept of wheel alignment and wheel balancing. Also discuss the significance of tyre rotation.

(b) Describe the anti-lock braking system used in automobile.