PAPER ID-410602

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B.TECH
(SEM V) THEORY EXAMINATION 2021-22
AUTOMOTIVE CHASSIS AND SUSPENSION

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

a. Describe any two functions of chassis frame
b. Name the various materials used for making the frame
c. State the purpose of differential lock
d. Define the different parts involved in Gearbox
e. How suspension systems are chosen for a particular vehicle
f. Describe the purpose of master cylinder in braking system.
g. Briefly explain dead axle and axle less transmission
h. Differentiate between over steering and understeering
i. Differentiate between wheel balancing and wheel alignment
j. What is an hill assist system?

SECTION B

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

a. Describe the types of chassis layout with the help of figures
b. Describe hooks type universal joint with neat sketch.
c. Explain the various components of air brake system
d. Describe the different types of steering gears used in automobile
e. Give the constructional details of Automobile Tires.

SECTION C

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

(a) Explain the different types of frames used in automobile
(b) How the testing and diagnosis of frame is performed

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

(a) Describe the construction and working of constant mesh gearbox used in automobile system
(b) A four speed gear box is to be constructed providing the ratios of 1.0, 1.46, 2.28 and 3.93 to 1 as nearly possible. The diametral pitch of each gear is 3.25 mm and the smallest pinion is to have at least 15 teeth. The centre distance between the layshaft and main shaft is 78 mm. Evaluate 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 Mac Pherson type front suspension with neat sketch.

(b) A vehicle weighing 13000 N has a wheel base of 2.8 m. The centre of gravity lies 1.4 m behind the front axle and 0.8 m above the ground. The vehicle moves on the level ground with a speed of 15 m/s. When brakes are applied to rear wheels only, calculate the load distribution and stopping distance of the vehicle.

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

(a) Describe semi floating and fully floating axles with neat sketch and their uses

(b) The Distance between the kingpin of the car is 1.3 m and the track arms are 0.1525 m long and the length of the track rod is 1.2 m. For a track of 1.42 m and wheel base of 2.85 m, Calculate the radius of curvature of the path followed by the near side front wheel at which correct steering is obtained and car is turning to the right.

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

(a) Explain the different types of Tyre wear and their causes

(b) Classify the various types of bearings their functions and material used.