PAPER ID-311033

Roll No: | | | | | | | | | | | |

BTECH
(SEM V) THEORY EXAMINATION 2023-24
AUTOMOTIVE CHASSIS AND SUSPENSION
TIME: 3 HRS   **M.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**

Q no.	Question	Marks	CO
a.	What is a chassis? Name its different components	2	1
b.	Discuss the different materials used for making the frame	2	1
c.	Describe the different parts of clutch and state the function of each part	2	2
d.	Differentiate between differential and differential lock.	2	2
e.	Describe the weight transfer phenomenon braking system in an automobile	2	3
f.	Discuss the different types of springs used in suspension system	2	3
g.	Explain the significance of full floating axle.	2	4
h.	Differentiate between over steering and understeering	2	4
i.	Describe the requirements of wheel used in automobile.	2	5
j.	Explain the operation of hill assist system	2	5

SECTION B

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

a.	Describe the layout of front engine rear wheel drive with the help of neat sketch. Also list its advantages and disadvantages	10	1
b.	Discuss the working of constant mesh Gear Box with help of neat sketch	10	2
c.	Explain the working of Macpherson Strut with the help of neat sketch	10	3
d.	Discuss the different types of steering gears used in steering system.	10	4
e.	Describe the construction and different parts of tyre	10	5

SECTION C

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

a.	Explain the different types of frame used in vehicle	10	1
b.	Describe the layout of front engine front wheel drive with the help of neat sketch. Also list its advantages and disadvantages	10	1

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

a.	Describe the function of differential gear box with the help of neat sketch	10	2
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	10	2

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

a.	Describe the construction and working of wishbone suspension system	10	3
b.	A vehicle weighing 15000 N has a wheel base of 3 m. The centre of gravity lies 1.5 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.	10	3

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

a.	Derive the condition for Davis steering mechanism	10	4
b.	A vehicle using Ackermann steering system has a wheel base of 280 cm and front wheel track 122 cm, the distance between kingpin axis 108cm. If the maximum deflection of inner front wheel is 40°. Calculate the turning radius of outer front wheel	10	4

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

a.	Explain the working of antilock braking system with neat sketch	10	5
b.	Describe in detail the different type of bearings for radial loads.	10	5