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**Total No. of Pages: 02**  
**Total No. of Questions: 09**

**B. Tech. (AE) (Sem.-6<sup>th</sup>)**  
**VEHICLE DYNAMICS**  
**Subject Code: BTAE-603**  
**Paper ID: (A2382)**

**Time: 3 Hrs.****Max. Marks: 60****INSTRUCTIONS TO CANDIDATES:**

1. **SECTION A is COMPLUSARY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION B** contains **FIVE** questions carrying **FIVE** marks each and students has to attempt any **FOUR** questions.
3. **SECTION C** contains **THREE** questions carrying **TEN** marks each and students has to attempt any **TWO** questions.

**SECTION A**

1. Write briefly:
  - (a) Define transmissibility.
  - (b) Differentiate free, forced and damped vibrations.
  - (c) How Dunkerley's method is different from Holzer method?
  - (d) State sprung mass frequency.
  - (e) What is the difference between over steer and under steer?
  - (f) What is wheel hop?
  - (g) Define simple harmonic motion.
  - (h) State wheel wobble.
  - (i) Discuss vibration absorber.
  - (j) Write a note on transient effects in cornering.

**SECTION B**

2. What are three elementary parts of a vibratory system? Explain briefly.
3. Explain the terms (a) pitching (b) yawing (c) rolling.
4. A motor car has a wheel base of 2.64 meter, the height of its centre of gravity above the ground is 0.61 meter and it is 1.12 meter in front of the rear axle. If the car is travelling at 40 km/ hr on a level track, determine the minimum distance in which the car may be stopped, when (a) the rear wheels are braked (b) all wheels are braked.
5. Write down the requirements of a vehicle suspension system.
6. Write short notes on Stability of a vehicle on a slope, on a curve and a banked road.

**SECTION C**

7. Explain in detail Holzer method with the help of example.
8. Discuss in detail Gough's tyre characteristics. Also explain modal analysis in multi degree of freedom systems.
9. Write short notes on:
  - (a) Logarithmic decrement
  - (b) Rayleigh's upper bound method
  - (c) Vehicle suspensions in force and apt directions

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