Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(AE) (2011 Onwards) (Sem.–6)

VEHICLE DYNAMICS

Subject Code : BTAE-603

M.Code : 71219

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

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

SECTION-A

1. Answer briefly :

(a) What do you mean by free vibration?

(b) Explain magnification factor.

(c) How dunkerley's method is different from Hozler method?

(d) What is wheel hop?

(e) What is an eigen value problem?

(f) What is tractive effort?

(g) What do you mean by Rayleigh's coefficient?

(h) Define camber and camber thrust.

(i) Write a note on directional stability of vehicle.

(j) What is meant by roll center?

SECTION-B

2. Explain single, two and multi degree of freedom system.

3. Write down the requirements of a vehicle suspension system.

4. a) An automobile having a mass of 3000 kg deflects its suspension springs 0.03 m under static conditions. Determine the natural frequency of the automobile in the vertical direction by assuming damping to be negligible.

   b) What methods are available for solving the governing equations of a vibration problem?

5. Explain in details Gough's tyre characteristics.

6. Define ride and explain ride dynamic system.

SECTION-C

7. Explain the following Turning response properties:

   Under steered gradient, Neutral steer, Under steer, Over steer, Characteristic speed and Critical speed

8. Write a short note on :

   a) Lograthmic decrement

   b) Rayleigh"s upper bound method

   c) Vehicle suspensions in force apt directions

9. For the system shown in figure given below, determine the natural frequency. Take $m_1 = m_2 = m_3 = m$ kg and $k_1 = k_2 = k_3$ kN/m

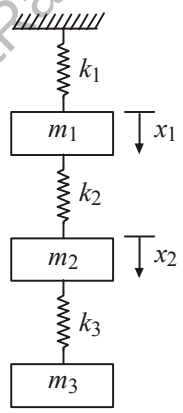

Fig.1

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.