FirstRanker.com
Firstranker's choice
www.FirstRanker.com www.FirstRanker.com

Code No: **RT41244** **R13** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, February/March - 2018

VEHICLE DYNAMICS

(Automobile Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1 a) State the principle of multi rotor torsional systems. [3]
b) Explain the term inertia loading on a multi degree freedom system. [4]
c) Briefly explain generalized coordinate system. [4]
d) What do you understand by forced vibrations? [3]
e) State the principle of energy dissipated by damping. [4]
f) State the applications of Viscous damping due to harmonic force. [4]

PART–B *(3x16 = 48 Marks)*

2. The following data are given for a vibratory system with viscous damping: mass = 2.5 ; spring constant = 3 N/mm and the amplitude decreases to 0.25 of the initial value after five consecutive cycles. Determine the damping coefficient of the damper in the system? [16]

3 a) Discuss important analysis of energy dissipated by damping equivalent also write its any two practical applications? [8]
b) Give the difference between critical damping and viscous damping systems? [8]

4 a) Distinguish between normal modes and principle modes also write their examples? [8]
b) What do you understand by generalized and principle co-ordiante system and explain briefly? [8]

5 Discuss the performance of vibration isolation and transmissibility and draw its graphical representation? [16]

6 A huge machinery is mounted on a bed plate which is supported on four elastic members, each having a stiffness of 3.92×10^6 N/m. The total mass to be supported is 1 ton. It is estimated that the total damping force exerted on the system is 20% of the critical and is of viscous nature. When the speed of rotation of the machine is 2000 rpm, the amplitude of vertical motion of the bed plate is 0.06 mm, calculate the total maximum force transmitted through each mounting to the foundation. [16]

7 Write a short notes on the following terms
a) Max wells reciprocal theorem
b) Influence coefficients
c) Orthogonality principle
d) Vibro meters [16]

www.FirstRanker.com