Registration No :

Total Number of Pages : 02

B.Tech.
PAU6I101

6th Semester Regular Examination 2017-18
VEHICLE DYNAMICS
BRANCH : AUTO
Time : 3 Hours
Max Marks : 100
Q.CODE : C138
Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.

Part – A (Answer all the questions)

Q1 **Answer the following questions : multiple type or dash fill up type** **(2 x 10)**
   a) What is the effect of braking in load distribution on wheels?
   b) Why negative camber is provided?
   c) What are advantages of independent suspensions?
   d) What is magnification factor in vibration system?
   e) Write down the specification of a radial tire to be fitted in a 16 inch rim in a crossover passenger car
   f) What is principle of correct steering?
   g) What is suspension spring rate?
   h) What is wheel shimmy?
   i) What is sprung mass frequency?
   j) What type of rear suspension is used in pick up vehicle?

Q2 **a)** The ratio of transmitted force to applied force is called …………………. **(2 x 10)**
   b) ………………..is an approximate method for fundamental frequency.
   c) Gear box is modeled as ……………torsion system.
   d) The fraction of total mass not carried by vehicle suspension is called ………… mass.
   e) Roads are………...to help in cornering.
   f) The………car model is required for cornering force analysis.
   g) The slip angle is the angle between direction of velocity vector and …………
   h) In luxury bus ……...suspension is used.
   i) ……………….tier is preferred for better safety.
   j) Double A-arm suspension is a……………type suspension.

Part – B (Answer any four questions)

Q3 **a)** Derive the expression for logarithmic decrement for under damped system. **(10)**
   b) Explain the working of a vibration absorber? **(5)**

Q4 **a)** Explain the construction and working of coil spring and damper system with neat sketch. **(10)**
   b) Write about choice of damper characteristics. **(5)**

Q5 **a)** How calculation of effective spring rate is done for vehicle suspension? **(10)**
   b) Write about construction of tier and important considerations in selecting them. **(5)**

Q6 **a)** Draw the half- car model and write its advantage over quarter car model? **(10)**

b) Find out the roll center of a double A-arm suspension. **(5)**

Q7 **a)** Find out the minimum time for 0 – 100 km/hour on a level road for a sport car with the following Specifications mass 1500kg, wheel base = 2500mm, width = 1500 mm, Assume C.G is at center and it height is 500 mm from ground level. The co-efficient of friction between road and tier is 0.5.When the vehicle is in (a) Rear-wheel drive, (b) Front-wheel drive and (c) Four-wheel drive. **(10)**

b) A vehicle has following specifications mass 1800 kg, wheel base 3500 mm, .Assume C.G is at center and the car is parked on an uphill road height of C.G is 700 mm, hill angle is 20°.Determine the forces under the wheels if the car is in (a) Front wheel braking, (b) Rear wheel braking and (c) Four wheel braking. **(5)**

Q8 **a)** Explain with neat sketch caster, camber toe in and king pin angle in suspension geometry. **(10)**

b) Differentiate between sprung mass and un sprung mass. **(5)**

Q9 **a)** Explain with neat sketch condition for correct steering and find out expression for turning radius. **(10)**

b) Differentiated between over steer and under steer. **(5)**