

C.U.SHAH UNIVERSITY

Winter Examination-2018

Subject Name: Vehicle Dynamics

Subject Code: 4TE07VDY1

Branch: B.Tech (Automobile)

Semester: 7

Date: 27/11/2018

Time: 10:30 To 01:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1

Attempt the following questions:

(14)

- a) Draw Vehicle fixed coordinated system.
- b) What are Euler angels?
- c) Maximum Performance in longitudinal acceleration of a motor vehicle is determined by one of two limits- engine power or traction limits on the drive wheels. True or false?
- d) The analysis of power limited acceleration involves examination of the engine characteristic and their interaction through power train. True or false?
- e) The intersection between the road load curves and any of the tractive effort curves is..... Speed that can be sustained in that gear.
- f) What do you mean by Brake Factor?
- g) What is representing by hysteresis mechanism?
- h) What is Brake proportioning?
- i) What is Separation Point?
- j) What is Drag force?
- k) Spring Shackles are used to join.....
- l) What is Un sprung weight?
- m) What is difference between open loop and closed loop in steering system?
- n) What is over steer?

Attempt any four questions from Q-2 to Q-8

Q-2

Attempt all questions

- a) Write a short note on Adaptive Cruise Control. **(7)**
- b) Explain anti-lock braking system with neat sketch. **(7)**



- Q-3** **Attempt all questions**
- a) Derive the equation to calculate the dynamic axle load for the following condition of four wheeler (7)
 - i) When the vehicle on level ground under static condition.
 - ii) When the vehicle on grads with low speed acceleration.
 - iii) When the loads on grades
 - b) Draw a neat sketch of Pressure distribution along the centerline of a car and Explain how the knowledge of Pressure distribution can be utilized. (7)
- Q-4** **Attempt all questions**
- a) Explain Power limited acceleration based on power train. (7)
 - b) Discuss the performance of braking on dry and wet road condition with vehicle slip and explain the effect of vehicle velocity, inflation pressure and vertical load on braking coefficients. (7)
- Q-5** **Attempt all questions**
- a) Explain Anti Squat and Anti dive suspension geometry. (7)
 - b) Explain the factors affecting rolling resistance. (7)
- Q-6** **Attempt all questions**
- a) Define suspension roll center and roll axis and explain the procedure for finding roll centers for independent suspension with sketch. (7)
 - b) Write a short note on the role of aerodynamic aids of vehicle. (7)
- Q-7** **Attempt all questions**
- a) Explain the functions of vehicular suspension and types of front and rear suspensions. (7)
 - b) What is steering geometry error? Explain the effects of steering geometry error. (7)
- Q-8** **Attempt all questions**
- a) What is the effect of steering torque, arising from later inclination angle and caster angle while steering? (7)
 - b) Explain Suspension effect on cornering. (7)

