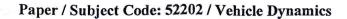
BELAUTO) sem (VIII) (CBSQS) Exam second half 2	018
; ;	Paper / Subject Code: 52202 / Vehicle Dynamics Date : 28	11/18
Tin	me: 3 Hrs Marks : 80	
NB	 1) Draw neat sketches whenever necessary. 2) Q. No. 1 is compulsory. 3) Solve any three questions from the remaining five questions. 4) Assume suitable data wherever necessary. 	
Q.1	Answer any five of the following :	20
	 a) Explain Steering geometry angles. b) Why suspension spring rates are kept low practically? c) What is slip angle and explain its effect on performance. d) What is rolling resistance? Enlist mechanisms which generate rolling resistance. e) Write a note on road resistance. f) What are the advantages of Ackerman steering Linkages ? 	
Q.2 a)	Find the distance between the double conjugate points for the passenger car – Sprung mass = 900 kg, wheel base = 1.2 m , Distance of CG from front axle = 1.2 m , Front suspension stiffness = 50 KN/m , Rear suspension stiffness = $150 \text{ KN} / \text{m}$	10
b)	Derive an equation for steady state response to side force. Explain the importance of stability derivatives.	10
Q.3 a)	What is body roll ? Explain the importance of Anti roll bar in context with vehicle dynamics with its working.	10
b)	Derive equation to find out pair of double conjugate points. How it is applied to real vehicle?	10
Q.4 a)	Explain interconnected suspension with diagram. Why it is used in automobiles and how it is achieved?	10
b)	Explain conicity and ply steer? How it affects vehicle performan	10
Q.5 a)	What are the tractive properties of tyre and how it affects vehicle performance?	10
b)	Find the yawing velocity of car when side force of 250 N is acting on it – Mass – 1200 kg, wheel base – 2.5 m, $CF = -70000$ N/rad, $CR = -75000$ N/rad Distance of CG from front axle = 1.4 m. Velocity = 60 KMPH	10

Page 1 of 2

59341

46D3B683026F7927DA11E9601A0C1404



Write short note on (Any Four)

- a) Air suspensionb) Jack knifing of articulated vehicles
- c) Roll centre and roll axis
- d) Central tyre inflation systeme) Wheel wobble and wheel shimmy
- f) Active suspension

Page 2 of 2

Q.6