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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES



End Semester Examination, April, 2017

Program Name: B. Tech (ADE)  
Course Name : Vehicle Infotronics  
Course Code : ADEG 441  
No. of page/s: 2

Semester – VIII  
Max. Marks : 100  
Duration : 3 Hrs

SECTION A

All questions are compulsory and carry equal marks.

4x5 =20

- 1) Explain IEEE 802.11p with respect to automotive industry.
- 2) Differentiate Electric and Hybrid electric vehicle.
- 3) What is NVH in Automobile? Explain its components.
- 4) Define ADAS with respect to modern vehicular technology.

SECTION B

Answer any four questions.

10x4 =40

5)

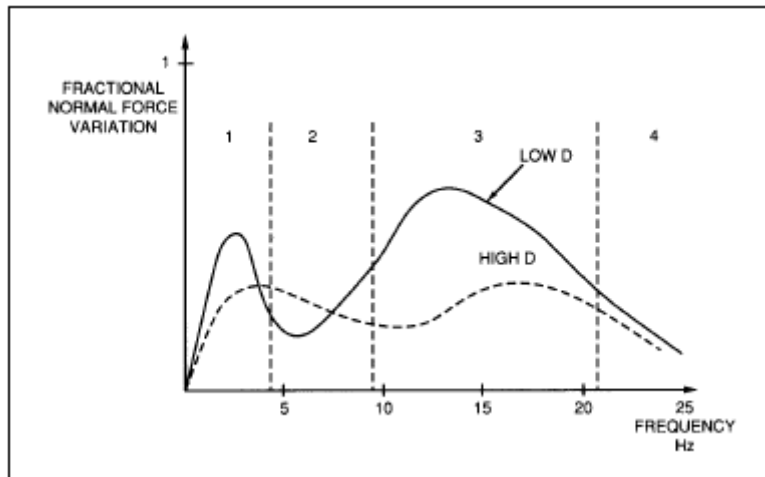
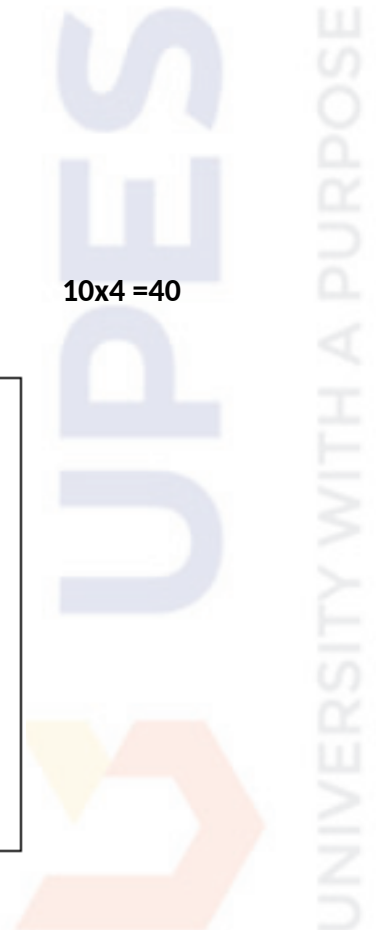


Figure: Tire Force Variation

With respect to the four frequency regions of Figure Tire Force Variation, the following generally desired suspension damping characteristics can be identified. Explain electronic suspension system with respect to following characteristics curve and region of operation.



Region	Frequency (Hz)	Damping
1. Sprung Mass mode	1-2	High
2. Intermediate Ride	2-8	Low
3. Unsprung mass response	8-20	High
4. Harshness	>20	Low

- 6) Explain EMI issues and possible remedies in term of automotive system.
- 7) Explain concept of automated guided vehicles. Also explain different types of guiding techniques used in AGV.
- 8) Explain intelligent drive by wire system with block diagram. Explain advantage and limitations of drive by wire techniques.
- 9) Explain working of adaptive cruise control system with block diagram. Also emphasizing how ACC should have automatic braking system.

### SECTION C

**Answer any two questions.**

**2x20 =40**

- 10) a) Explain Semi active suspension system with neat block diagram.  
b) Write technical note on MISRA C guideline for automotive application.
- 11) a) Briefly explain different networking protocol used in vehicle.  
b) Explain CAN Bus system. Explain CAN bus message format with neat sketch and explain each frame.
- 12) Write short technical note on following
  - a. Smart control of Vehicle Dynamics
  - b. Adaptive Headlight System
  - c. Different Protection technique for power supply transient.
  - d. Electromagnetic compatibility